

KANUNNAH

The Research Journal of the
Tasmanian Museum and Art Gallery

VOLUME 6

Ka-nunnah – ‘Thylacine’

The oldest fossils of thylacines are Late Oligocene to Middle Miocene in age (20–25 My B.P.) and are from the Riversleigh deposits in north-western Queensland (Vickers-Rich *et al.* 1991). It is speculated that competition with introduced dingoes in mainland Australia may have caused their extinction in mainland Australia during the last 5000 years. The most recent remains of thylacines in mainland Australia were dated at just over 3000 years old (Archer 1974).

The thylacine (*Thylacinus cynocephalus*) in Tasmania coexisted with Aboriginal people for millennia. The arrival of Europeans in Tasmania resulted, in just over a hundred years, in the extinction of thylacines from their last refuge. The demise of the thylacine resulted in the extinction of an entire lineage of marsupials from the planet.

To the Aboriginal people of Tasmania the thylacine was called many things due to its wide spread distribution in the State. Tribes from the areas of Mount Royal, Bruny Island, Recherche Bay, and the south of Tasmania referred to the Tiger as ‘Ka-nunnah’ or ‘Laonana’, while tribes from Oyster Bay to Pittwater called it ‘Langunta’

and the North-west and Western Tribes called it ‘Loarinnah’ (Milligan 1859). Famous Tasmanian Aboriginal chief Mannalargenna from the East Coast of Tasmania called the thylacine ‘Cab-berr-one-nen-er’, while Truganinni and Worrady, (Bruny Island) called it ‘Can-nen-ner’.

The thylacine is the state logo for Tasmania. The title of the journal ‘Kanunnah’ commemorates the Tasmanian Aboriginal word used by tribes from southern Tasmania for the thylacine.

Archer M (1974) New information about the Quaternary distribution of the thylacine (Marsupialia: Thylacinidae) in Australia. *Journal and Proceedings of the Royal Society of Western Australia* **57**: 43–50.

Milligan J (1859) Vocabulary of dialects of Aboriginal Tribes of Tasmania. *Papers and Proceedings of the Royal Society of Tasmania* **3(2)**: 239–282.

Vickers-Rich P, Monaghan JM, Baird RF, Rich TM (1991) *Vertebrate Palaeontology of Australasia* (Monash University Publications Committee: Melbourne).

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KANUNNAH

The Research Journal of the Tasmanian Museum and Art Gallery

The Tasmanian Museum and Art Gallery is a combined museum, art gallery and state herbarium. It has the broadest collection range of any single institution in Australia and these collections span the arts, sciences, history and technology. The Tasmanian Museum and Art Gallery's role is to collect, conserve and interpret material evidence on the State's natural history and cultural heritage.

Kanunnah is a peer-reviewed journal published by the Tasmanian Museum and Art Gallery in Hobart, Tasmania. Its aim is to disseminate research in all areas of study undertaken by the Tasmanian Museum

and Art Gallery. These areas include the life sciences, culture, history and the arts. Papers on any of these research areas will be considered, but papers dealing with Tasmanian, southern Australian and sub-Antarctic issues will be particularly welcome.

Short communications and reviews are also welcome. Researchers based outside the institution are encouraged to submit manuscripts for publication to the journal, although they must be relevant to the Museum's primary areas of study.

Kanunnah will be published occasionally, depending upon budgetary considerations and available manuscripts.

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COVER IMAGE: The new Central Gallery at the Tasmanian Museum and Art Gallery.

See pp. 1–14

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INTRODUCTION TO THE REDEVELOPMENT OF THE TASMANIAN MUSEUM AND ART GALLERY

The Tasmanian Museum and Art Gallery is a unique cultural facility. It provides visitors with the most comprehensive museum experience in the nation.

On the site on which our Museum stands exists rare evidence of pre-European Aboriginal co-existence with the land, including some of the only undisturbed Aboriginal middens in Hobart.

On this unique site also stands a collection of the most significant and diverse heritage buildings anywhere in the nation. Intermingled with these buildings are the collections that comprise the collecting wisdom of many curators which showcase the broadest collection of any single institution in Australia.

Established by the Royal Society of Tasmania in 1843 the Royal Society Museum, later the Tasmanian Museum and Art Gallery, has been continuously occupying its existing site since 1863.

Over those intervening years additional buildings on site were acquired and many new collections helped to weave the rich

tapestry of Tasmania and also interspersed evidence of our place within a broader global context.

One hundred and fifty years of additions and modifications had somewhat camouflaged the original intention of the interior of this collection of heritage buildings. Put simply, the visitor to the Museum had no idea where they were or had any opportunity to appreciate the diverse architectural styles that were surrounding them.

In 2007 the then Premier, Paul Lennon, was enthusiastic about showcasing our land, our buildings and our collections to Tasmanians and visitors to our island. He announced the bold vision of a \$200 million redevelopment of the site and provided \$30 million in funding to enable the Museum to complete Stage One of this bold vision.

In March this year Premier Lara Giddings officially opened the completed first stage of our redevelopment which has increased public space, reactivated every

heritage building on site for public access and exposed the diversity of architectural styles that a museum visitor can experience in very few museums throughout the world.

Modern infrastructure was hidden, but enabled TMAG to provide twenty-first century interaction with the various collections.

School and education programs became a priority and have significantly increased the academic offer to the broader community.

In the four months since the reopening over 400 000 visitors have experienced our new Museum. The feedback of these visitors has been overwhelmingly positive culminating in our Museum winning the

Museums and Galleries national award for outstanding achievement.

Our capacity to deliver Stage One of this exciting redevelopment has been made possible by the sheer hard work and determination of all TMAG Trustees, staff and volunteers, our builders and contractors, who have combined to develop and deliver a truly remarkable visitor experience.

We all hope that you have the opportunity to enjoy our Tasmanian Museum and Art Gallery.

Bill Bleathman

Director,

Tasmanian Museum and Art Gallery

KANUNNAH

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A REDEVELOPED TASMANIAN MUSEUM AND ART GALLERY. STAGE ONE

Jennifer Storer and Bill Seager

Storer, Jennifer, and Seager, Bill, 2013. A redeveloped Tasmanian Museum and Art Gallery. Stage One. *Kanunnah 6*: 1–14. ISSN 1832-536X. The Tasmanian Museum and Art Gallery is unique in Australia, being a combined museum, art gallery and State herbarium. In 2006 a multi-million dollar project to redevelop TMAG to create a world-class intellectual and cultural icon befitting its history, collections and research, was announced. The construction of Stage One was completed and opened in March 2013. This paper described the process from proposal to completion of Stage One of the redevelopment.

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KEY WORDS: Tasmanian Museum and Art Gallery, TMAG, Redevelopment

History and reflection

The Tasmanian Museum and Art Gallery (TMAG) is a unique institution in Australia. No other institution is a combined museum, art gallery and State herbarium. The State collection spans the arts, natural sciences and cultural heritage and the objects, with the stories they tell, make this museum just as important to visitors from interstate and overseas as it is to Tasmanians.

TMAG is also Australia's second oldest museum having its origins in the collections of Australia's scientific society,

the Royal Society of Tasmania, established in 1843. The first permanent home of the Museum opened on the corner of Argyle and Macquarie streets in 1863 and the Museum has gradually expanded from this corner site to occupy the entire city block including Tasmania's oldest surviving public building, the 1808–10 Commissariat Store. These nationally significant heritage buildings are also considered part of TMAG's State assets deserving of display and interpretation.

TMAG has always been a must-see cultural tourism destination. The

Redevelopment now gives new life to parts of the museum that have never before been opened up to the public, and our State Collection is more accessible than ever before, through new exhibitions, new programs and digital projects, and through improved access to all areas of the museum site. TMAG has much to offer visitors of all ages, with new and extended education programs and family activities, as well as enhanced opportunities for lifelong learning.

Background

On the 15 March 2013 the Tasmanian Museum and Art Gallery opened its new front doors and welcomed the first visitors to a completed Stage One of its redevelopment. Seven years earlier, in February 2006, faced with an increasing inadequacy in its ability to operate, TMAG presented the State Government with a feasibility study and business case for the redevelopment of its city site.

The project quickly became a reality:

- In 2006 the then Premier Paul Lennon MP announced a multi-million dollar project to redevelop TMAG in recognition of its importance to Tasmania as custodian of the State Collection. The aim was to create a world-class intellectual and cultural icon befitting its history, collections and research, and its place in the Tasmanian community and tourism industry. Later that year \$30 million was committed to start the project.
- Work began on the project plan, establishing project governance, staffing, and a comprehensive brief for the master-

planners. In May 2007 procurement commenced for appropriate contractors to undertake an archaeological desk top study, geotechnical investigations and site survey work. These were used to inform the TMAG Masterplanning process.

- Expressions of interest for a Masterplan design team were called in May 2007 and architects Johnson Pilton Walker (JPW), in association with the Tasmanian-based architectural firm Terroir, were appointed to develop the masterplan. Submissions were assessed by an expert panel including then New South Wales state architect Peter Mould, and New Zealand architect Ian Athfield.
- On 3 September 2008, the then Premier David Bartlett MP announced the completion of the masterplan and presented it to the public through an exhibition, and called for comment. Extensive formal research established that 93% of the public were overwhelmingly in support of the redevelopment. (Fig. 1)
- In October 2009 multi-award winning Australian architectural firm Francis-Jones Morehen Thorp (FJMT) was appointed to undertake full concept designs for the master plan vision. At that time it was envisioned as a single stage project for \$200 million to be completed by 2014. However, without further committed funding, TMAG contracted FJMT to allow flexibility for the future implementation of the masterplan should further capital funds become available.
- TMAG Trustees and the Project Steering Group developed a scope for delivery



Fig. 1. Masterplan exhibition, Bond Store ground floor, TMAG, September 2008.

of Stage One. Its priorities were works to enhance TMAG's heritage buildings with minimal abortive work should subsequent funding become available, improvement to visitor circulation and services, and new exhibitions and programs.

- In October 2010, the then Minister for the Arts, David O'Byrne MP, announced the completed architectural concept design for the full project vision of the TMAG redevelopment, with Stage One works to commence within the State Government's existing \$30 million commitment. Detailed architectural design then commenced for Stage One only. (Fig. 2)
- The successful building works tenderer, VOS Construction & Joinery Pty Ltd signed a contract on 17 November 2011 to commence physical work. The majority of the construction work took place whilst the Museum remained open to the public in various forms. TMAG closed to the public on 11 November 2012 to allow safe completion of construction activities and to allow for the installation of new and exciting exhibitions across the site.
- The construction of Stage One was completed in and around exhibition installation of over 2800 objects and TMAG reopened on 15 March 2013. It delivered all it promised and on budget.



Fig. 2. Concept view of a completely redeveloped TMAG by architects FJMT.

Stage One promised and delivered:

- A new visitor entrance which made a feature of the historic Watergate building and surrounding grounds;
- Reinvigoration of the existing foyer to provide an enhanced visitor experience;
- Building upgrades to the Queen’s Warehouse and Tasmania’s oldest building, the Commissariat Store, to create new visitor, member and education facilities;
- Public access to all four floors of Australia’s oldest Georgian warehouse, the Bond Store;
- The roof of the old Zoology Gallery was uncovered and raised to expose its original heritage features, becoming TMAG’s Central Gallery;
- The opening of major new exhibitions in the Bond Store, Henry Hunter and Central Gallery spaces.
- New services and security platforms, fire protection, electrical, mechanical, lighting and communication systems for maximum future benefit and sustainable operations.

Approach to exhibitions and programs

The Redevelopment project has allowed for a complete reappraisal of how the Museum interprets its stories and presents them to visitors. In essence, the project is unique because it is the first large scale collective re-interpretation of the State’s collections since the museum opened in 1863.



Fig. 3. Bond Store Ground. Our living land. Encountering an upside down world.

One of the most innovative aspects of the project is how a series of 12 new core exhibitions have been realised as a coherent whole within a specifically challenging site. The TMAG site consists of a series of ten buildings built between 1808 and 1986. It is often referred to as the most important collection of historic buildings on any one site in Australia. For the first time almost all of TMAG's spaces are open to the public, with many of the most important heritage buildings redeveloped for exhibition and visitor program use.

The two main areas redeveloped for exhibitions are the 1826 Bond Store and nineteenth-century Henry Hunter suite of galleries. The Bond Store sits at

the new entrance to the Museum site and is not connected internally to the museum's other public spaces. With this in mind we applied a distinctive approach to developing exhibitions for this space. Thematically and through design we have achieved a vertical journey of exhibitions that speak to each other across three floors and act as a microcosm to the more expanded themes presented within the main part of the Museum. The incentive has been to allow the building to speak for itself, as an almost entirely intact example of Georgian architecture, while establishing new core exhibitions rich in content and design. Thematically the exhibitions speak to three major themes



Fig. 4. Bond Store 1. Our changing land. Creating Tasmania.

in Tasmanian nineteenth-century history: the ‘conquest’ of the Tasmanian natural world; the development of the Tasmanian social world and identity; and cultural conflict and the Black Wars. None of these stories have previously been told in any depth at TMAG, and all are integral to the Tasmanian story and Tasmania’s place in the nation.

The exhibition on the Black Wars is particularly innovative. We have aimed to tell this very important story from multiple perspectives, with the aim of putting the visitor into the shoes of those experiencing the events. With little original cultural material surviving from the period we decided to tell the story largely through film. Local filmmakers

Roar Film were commissioned to produce a series of parallel films that are projected on opposite walls within the space. One side tells the story from the Tasmanian Aboriginal perspective, the other from the European. The exhibition is already proving to be extremely popular, eye-opening and controversial.

Visitors are overwhelmingly aware of, and positive about, the way these exhibitions work together. This is largely due to the design approach. It is a rare and difficult challenge to connect three floors of exhibition space in such a way. (Figs 3, 4 & 5)

Other exhibitions are innovative as they focus on Tasmania’s points of difference. In an attempt to remove



Fig. 5. Bond Store 2. Our land. Parrawa parrawa! Go away!

some of the barriers that exist between collections we have aimed to open up the flow between spaces as much as possible and create points of connection between collection-led exhibitions. This means that the breadth and diversity of TMAG can be appreciated like never before. In the central museum complex one floor of exhibitions is devoted to Tasmania: People and Environment and a second floor to Tasmania: Art and Design. Our Design team applied a very holistic approach to these spaces and the interpretive outcomes. Each has a character of its own, but each space has the same showcase furniture, labelling and general design strategies. All doors between galleries have also been opened

up. The result is a processional suite of exhibitions that connect to each other, allowing the visitors to carry their interpretive and visual journey from one space to the next.

A major highlight of the Henry Hunter galleries is the showpiece Central Gallery. It's exhibition acts as a heart for the entire museum, and features that gallery's original 1901 blackwood, huon and kauri pine staircase in a soaring structure that treats the visitor to many of TMAG's treasures, as well as offering insight into our collecting history and the type of museum we are. Surrounding the gallery are two levels of internal window showcases, many double-sided, and a mezzanine walkway. The whole space



Fig. 6. Central Gallery.

is crowned with the gallery's original glass lantern and single span trussed steel work ceiling, exposed for the first time in decades and raised an extra storey to create one of Australia's most beautiful gallery spaces. (Fig. 6)

Design, object and story

All 12 of the new exhibitions produced for TMAG's redevelopment are core exhibitions based on, and featuring, collection material. It has been a primary objective of this project to reintroduce, reinterpret, and highlight as much of TMAG's collection as possible. The interpretation strategy and design philosophy were therefore produced to fulfil this desire.

The Interpretation Strategy in particular outlines a new creative approach, but also establishes a working document for future exhibition development and growth. An important part of this has been to encourage an interpretive approach focused on visitor engagement and multiple levels of information delivery. In simple terms this meant creating numerous avenues by which the collection could be brought to life, focussing on the connections between objects, and the people and events surrounding them, rather than on traditional hierarchies of information. This has allowed us to work the different areas of the collection together in new ways to tell a uniquely Tasmanian story.

A balance between new approaches and established Museum strengths also needed to be woven into the exhibition plan. Visitor research had established a top ten list of what people wanted to see at TMAG, ranging from the thylacine (Tasmanian tiger) to convict and Antarctic stories. Our challenge was to incorporate these elements while avoiding purely discipline based galleries. This was overcome by establishing strong links between the larger core installations, and by making exhibitions that were easily changeable. The latter we see as vital to future exhibition growth, and so the current exhibitions have been developed so that singular stories and objects can be changed without disrupting thematic flow, allowing for a greater turnover of objects for the public's enjoyment.

The Design philosophy has also been vital to this approach. TMAG intentionally established an in-house design capacity to ensure the holistic delivery of a distinctive TMAG creative identity that not only enhances the visitor experience but the objects themselves and their accompanying interpretive intent. (Figs 7 & 8)

One major and vital element to our project has been the identity and way-finding. This was immediately incorporated as part of the content projects to ensure that it was aligned to the interpretive philosophy and exhibition design approach wherever possible. This resulted in a new brand identity with major external signage and internal directional signage that enhances the visitor experience and the identity of TMAG as a creative force. This project also delivered a new Style Guide for

TMAG (its first) so all collateral and labelling, print and on line, are part of the holistic creative message.

Another specific program that has been developed to convey object significance is *Shaping Tasmania, A Journey in 100 Objects*. Ninety-nine objects from across all exhibitions were selected and highlighted as being particularly significant to the TMAG and Tasmanian story. These objects have been interpreted and photographed and form part of an online visitor program. Wi-Fi facilities allow the visitor to follow the *Shaping Tasmania* journey with their hand-held devices. The 100th object was selected from the community. The public were invited to submit objects that they consider important to the program's website and TMAG selected one object to showcase on a quarterly basis. The object is housed in a special showcase at the entrance to the Museum. This program has been developed in partnership with the Australian Broadcasting Commission (ABC) and is just as active for the online visitor at <www.shapingtasmania.tmag.tas.gov.au>

Sustainable museum practice

All new exhibitions exist in heritage spaces, many of which were never designed and built for exhibition purposes. A large team of consultants were contracted to the project to ensure that all impacts to the spaces and what would go within them were sustainably managed. Heritage architects, service engineers and archaeology consultants all worked with the project over a number of years to ensure the introduction of services (without which TMAG naturally could not host



Fig. 7. Henry Hunter Gallery 2. Tasmania Earth and Life.



Fig. 8. Henry Hunter Gallery 4. The Power of Change.

exhibitions or collection material) that were sympathetic and compliant. For example, the Bond Store building is now fitted with fire detection and alarm systems, sprinkler systems, power and communication services, temperature control and other services to ensure that the galleries can sustain exhibitions and collection material. All three floors of core exhibition in this building host important collection material.

All exhibition furniture was also designed and manufactured to a high standard, using conservation grade materials. Heritage showcases have also been refurbished with conservation grade materials ensuring their ongoing

use, and adding to TMAG's commitment to sustainability. Object conservation is naturally of primary concern and all exhibitions are designed, through their thematic and design structure, to accommodate regular changeover. Some other practical treatments introduced to spaces and designed to ensure appropriate object care include the conservation filming of all external glass surfaces and light reduction blinds in heritage galleries where the identity of the external windows remains to enhance their architectural integrity.

This stage of the redevelopment did not include the construction of newly built gallery spaces, reducing our capacity

to introduce brand new and holistic sustainable materials and practices. However, some of the additional measures we have introduced include:

- Re-use of our stock of heritage buildings which we deemed preferable to demolishing and rebuilding new.
- LED lighting everywhere to reduce operational costs.
- Passive environmental control through louvres and natural light where appropriate.
- Improvement to existing environmental control systems rather than all new, including new building management systems to assist in providing energy efficiencies.
- Recycling a lot of building material on site; for example, by re-using stone around archaeological features.
- Introduction of separate waste bin system (recyclables, waste, etc.) for public and commercial use.
- Drip watering system and indigenous species to cut down water usage in landscaped areas.

Public response

To date, the public's response has been overwhelming. The Museum received approximately 60 000 visitors in the first 20 days following its reopening, a previously unheard of figure for TMAG. Almost all local media and many national media visited, resulting in significant airtime and positive peer response.

Visitors have also been extremely positive and generous in their comments. The visitor book is full of praise for an institution that they consider to be beloved but are now very proud to see refreshed. Visitors are also responding

strongly to content as well as the design and interpretive journeys. They are responding positively to our philosophy of connectivity between collections and spaces and see our 'new look' as very much part of this philosophy.

Prior to the completion of Stage One TMAG had been averaging 260 000 visitors per annum. As of August 2013, four and a half months after opening, there were already over 266 000 visitors. However, it is certainly clear that TMAG is now considered to be central to the community's sense of place, and to any visitor from interstate or overseas.

Education initiatives

The new exhibitions were developed with full cognisance of the Australian Education Curricula. Each gallery's broad thematics were mapped against the curricula parameters, particularly the new Australian History and Science curricula. Whilst the Arts curriculum is still in draft form, this was also taken into consideration.

Educational users are a key audience group in the museum. Approximately a third of all primary aged students in Tasmania visited the TMAG in the past, with secondary student visitors somewhat lower. With the new exhibitions and overall redevelopment we are expecting this participation to dramatically increase, and early feedback from teachers indicates this will be the case. Since reopening the Museum has conducted discipline specific and cross curricula professional development to brief teachers on content and curricula links: these have been in the areas of Tasmania Aboriginal

Culture, Tasmanian Colonial History, Natural sciences, Colonial Art and Contemporary Art.

Additional resources have been developed to enable educators to maximise the usage of the Museum exhibitions and collections as a learning resource. These include: Teacher backpacks (resources for teachers to use on self-guided classroom visits and containing 'handleable' objects and artefacts as well as object notes and sample discussion questions). On-line resources (still undergoing development) for Art, Tasmanian History, Aboriginal Culture and Natural Sciences).

Other resource material has been developed which will have a broad audience appeal, including students and educators. This includes the *Shaping Tasmania: a Journey in 100 Objects* website <www.shapingtasmania.tmag.tas.gov.au> and virtual tour of the collection with audio, rotational and zoom imagery and research notes, plus locational data on Google Maps of where the object is from and a gallery location to see the object in real life. Early Years education has also been elevated in the Museum's offering, with new Discovery Backpacks available for free loan to family groups with an intergenerational agenda in its pedagogy.

Programming for students across all the above mentioned thematic areas in response to the exhibition content has been developed and delivered by educators to school groups in programs that range from 20 minutes to two hours in duration. All of these are linked back to curricula outcomes to maximise the relevance for school groups.

Tourism initiatives

The rest of Australia and indeed the world are increasingly coming to associate Tasmania with a rich and vibrant arts, cultural heritage scene. TMAG is now set to take full advantage of the attention Tasmania is currently receiving, reopening in a year when Tasmania is receiving international accolades from the likes of Lonely Planet and Tripadvisor. TMAG will be able to take advantage of Hobart's recognition as one of Lonely Planet's top 10 destinations to visit in 2013, with tens of thousands of visitors from interstate and overseas expected to join locals to enjoy our site on Hobart's iconic waterfront. We are at the very heart of the renaissance itself.

Conclusion

What none of the facts above reveal is the story of the efforts, encouragements, highs and lows of what has been a long and ultimately rewarding journey borne out of persistence and determination. Even the hiatus involved in moving from a full masterplan delivery to a staged approach has reaped the benefit of the adage "Measure twice, cut once".

The team employed innovation and problem solving to restore the character of TMAGs heritage buildings and then adapted them for museum requirements. It added unapologetic contemporary insertions to improve amenity, highlight archaeological features and create a logical, unified whole. Even exhibition designers worked with the building spaces. It all works together and it is as if the collections have come home.

Root Projects Australia Pty Ltd were with TMAG from the inception of the project and were invaluable in establishing

a sound business case and in facilitating critical phases of this project. Their wisdom in helping TMAG set a comprehensive brief and choosing both our excellent masterplanners and architects were key components of this project's success.

There are a myriad of ways that TMAG may have chosen to staff the project but a tightly knit core team who intimately understood the needs of the museum as a whole and had its long term interests at heart was pivotal to achieving all it did.

The Director gave so much of his time and attention during design and at key decision times and supported the team throughout.

Finally, the Trustees have not deviated in their continued support for realising the full Masterplan vision which has buoyed all those involved in the stormy waters of the journey of Stage One and convinced us all that there is a hopeful, dare that someone has said, inevitability, about its full realisation to come.

ORLANDO BAKER (1834–1912). ARCHITECT FOR THE FEDERATION PERIOD BUILDINGS ON THE TASMANIAN MUSEUM AND ART GALLERY SITE

Malcolm Kays

Kays, Malcolm Stanley, 2013. Orlando Baker (1834–1912). Architect for the Federation period buildings on the Tasmanian Museum and Art Gallery site. *Kanunnah* 6: 15–58. ISSN 1832-536X. Orlando Baker was born in England's west country in 1834. Although his father and two of his older brothers were stonemasons, he was apprenticed as a carpenter. More at home with the pen than the hammer and saw, he took up employment as a builder's clerk. He developed an interest in architecture, and after acquiring the necessary knowledge, skills and experience through his work over twelve or so years, he branched out into private practice around 1872. Unable to depend upon architecture alone to make a living, he offered a diverse range of additional services, including those of surveyor and valuer. While he did win occasional worthwhile commissions as an architect, it seems he never prospered and in 1890, at the age of 56, he left England to make a new start in Tasmania. Soon after he arrived, the major depression of the 1890s set in, bringing the building industry to a near standstill for 3–4 years. He managed to eke out a living over these years, still identifying as an architect, but probably relying on some of his other specialties to survive. Unable to accumulate sufficient savings to provide for his declining years, he accepted, at age 63, a relatively lowly paid job as a draftsman with the Tasmanian Public Works Department. In this role, he flourished, producing some fine designs. Because of tight government funding restrictions, he was never formally classified or paid as an architect, although he was basically performing the duties of the previous government architect. He retired in 1911, aged 77, and died just sixteen months later.

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KEY WORDS: Orlando Baker, John G. Shield, Tasmanian Museum and Art Gallery, Tasmanian architects, Thomas Midwood, Thomas Searell, Public Works Department, Society of Architects



Fig. 1. Map showing the location of Stroud – marked with a red dot – in South-West England. Note the location of Swindon to the south-east. This city was of critical importance later in Orlando Baker’s life. Note also the magnified view (inset) of his ‘home territory’, showing the various small villages or hamlets associated with his family.

The early years

The available evidence suggests that Orlando Baker was born some time in the first few months of 1834.¹ His birthplace was a small rural hamlet – either Minchinhampton or nearby Brimscombe – about 4 km south of Stroud, a regional centre in the picturesque Cotswolds district of Gloucestershire, in the west of England.² His parents were Daniel and Jane Baker, and he was the youngest of five children.³

From the outset, a future in the building industry seemed a likely prospect for him. His father, Daniel (born c. 1796), was a stonemason, as were his two eldest brothers – Charles (b. c. 1819) and George (b. c. 1821). He had one sister,

Caroline (b. c. 1823), and another brother, Theophilus (b. c. 1828).⁴ Theophilus was the ‘odd one out’ amongst the brothers in that he trained as a shoemaker, but he was to die when he was only twenty years old.⁵

The first few years of Orlando’s life were spent in the rural tranquillity of the farming country south of Stroud, where his parents had been born and raised.⁶ Stroud lies just east of the head of the River Severn estuary, with the county capital, Gloucester, only 13 km to the north, and the large city of Bristol about 40 km to the south-west. The town had experienced a growth spurt in the early phase of the Industrial Revolution with the construction of woollen mills, supplied with fleeces from Cotswold sheep

herds and powered by water from the local streams, but the real impact of the revolution on the young Orlando's life was yet to be felt.⁷ (Fig. 1)

The second, heavy-industry phase of the Industrial Revolution was to exert a profound influence on Orlando's life, as it did on so much of the population of Britain. It was a time that saw the growth of iron and steel manufacturing, of heavy engineering and chemical works, and – significantly – of the appearance and rapid expansion of the railways. The demand for labour in the factories and for all kinds of massive construction projects saw families uprooted and relocated across the country. The Baker family was no exception: by 1841 they had relocated to the village of Cawston in Norfolk, on the opposite side of the country.⁸ With Daniel (then 48), Charles (25) and George (20) all being stonemasons, work on some large construction project seems the only plausible explanation for their dramatic relocation. Cawston itself was only a small rural centre, and there seem to have been no major building or infrastructure works taking place in the village at the time, so it was perhaps just a convenient residential base for a project further afield. From there, it was only 18 km to the centre of the city of Norwich, a more likely location for a substantial building project.

By late 1847 most or all of the family had returned – at least temporarily – to Gloucestershire, to reside in Minchinhampton.⁹ The disruption to Orlando's family life was, however, to continue: evidence from March 1851 reveals that his father and eldest brother (Charles, then 32) were then lodging in a boarding house in Great Malvern, Worcestershire,

in the western Midlands, working as stonemasons on some other major construction project.¹⁰ Orlando, then 17, was still living back in Minchinhampton, with his mother and his sister Caroline.¹¹

Starting out in the building industry and married life

Significantly, Orlando was listed in his 1851 census entry as an apprentice carpenter.¹² Perhaps prolonged absences of his father and elder brothers on building projects elsewhere had denied him the opportunity to be apprenticed as a stonemason under one of them, but his future in the building industry was nonetheless secured.

He seems to have continued to live in his old home territory throughout the 1850s, although some time around the middle of the decade he moved from Minchinhampton to neighbouring Brimscombe. A major milestone in his life occurred when he married local girl Louisa Antill on 13 May 1858, in the 'Independent Chapel', Bedford Street, Stroud.¹³ Like Orlando, she was 24 years old, was residing in Brimscombe, and came from fairly humble circumstances. Her father, John, was a labourer, and her birthplace was most likely the nearby village of Bisley.¹⁴

By the middle of the decade, Orlando would have become a fully qualified carpenter, but he seems not to have remained in that occupation for long, as his marriage registry entry describes him as 'general clerk'. This career change, which may well explain his relocation to Brimscombe, might have been due to lack of employment opportunities in carpentry, but it is more likely to have

been a matter of choice: it is evident from his later life that he had sound literacy skills and more intellectual leanings, and he appears to have been more at home with pen and paper than with hammer and saw. Whether this clerical job was in a building-related field is not clear, but that was certainly the case three years later, as his entry for the census of 7 April 1861 lists him as ‘builder’s clerk’.¹⁵ One inference that can be drawn from this new job title is that he was working for at least a moderately sized – if not relatively large – building firm, as a builder working alone could hardly have afforded the luxury of a ‘clerk of works’ type of position. A corollary of this is that he probably had responsibilities for some reasonably substantial building projects.

The Great Western Railway – a profound influence

The implied larger scale of Orlando’s employing firm and its activities may well hold a clue to the change in job opportunities for him and other workers in the Stroud locality. Whereas his father and older brothers had ventured further afield for work only a decade earlier, Orlando was fortunate enough to secure a responsible position that allowed him to remain living in his old home town. This change, and perhaps even his actual job, can in all likelihood be traced to developments with the railways. In 1840, the Great Western Railway (GWR) had reached Swindon in Wiltshire, just 35 km to the south-east. From there, a branch line was pushed north-westwards towards Gloucester, passing through Brimscombe (within easy walking distance of

Minchinhampton) and Stroud, with both towns’ stations opening in 1845. The main line – from London, through Swindon and on to Bristol city – had been completed in 1841. These developments placed cities inside a 40 km radius of Stroud within a theoretical travelling time of less than an hour (depending upon the number of stops at local stations), allowing more flexibility for people in the area. The Stroud railway station was actually designed by Isambard Kingdom Brunel, the great British engineer and industrialist responsible for the design and oversight of the GWR project.¹⁶ The GWR was a major employer, not only of staff operating and servicing the trains and tracks, but also with the initial construction and continued expansion of the network, of workers building infrastructure such as stations, bridges, tracks, maintenance depots and engineering works. With such a large, ongoing building program the company would doubtless have had a need for ‘builders’ clerks’.

Acquiring skills and a family

The probable nature of Baker’s work as a ‘builder’s clerk’ suggests that he was both intelligent and reasonably well educated. It is likely to have entailed duties such as preparing contracts and correspondence; performing calculations for costings, quantity estimates and structural aspects of buildings; preparing job tenders; preparing plans and specifications for buildings; and drafting site plans and property diagrams. In the process, he would have been developing increasing competence in the technical skills required by an architect.

The 1860s were a time of relative stability in the lives of Orlando and Louisa: their 1861 census entries show them living in Minchinhampton, where they seem to have remained throughout the decade, and he appears to have continued in the same work. During this time, they had six children, all of whom were to survive into adulthood: Louisa Anne (1861), Martha Jane (1863), Orlando George (1865), twins Lucy and Clara (1867), and Arthur (1869).¹⁷

Swindon, nerve centre of the GWR

Some time around 1870, when about 36 years old, Baker relocated with his family to the city of Swindon in the adjoining county of Wiltshire, taking up residence at 23 North Street.¹⁸ The move – by a brief rail journey of only 35 km to the south-east – was small, but in retrospect it can be seen as one of those events that was pivotal in determining his eventual vocation as an architect. There was actually no immediate change in the general nature of his work: a year later his census entry still listed him as ‘builder’s clerk’,¹⁹ but something significant had obviously happened to persuade him to forgo the comfortable familiarity of his life in Minchinhampton.

Swindon was undoubtedly a place of considerable opportunity at the time. Its growth had exploded during the 1840s with the development of Brunel’s ‘Swindon Works’ for the GWR, transforming it from a small market town into a booming railway industrial centre.²⁰ The works had become operational in 1843, focusing initially on the repair and maintenance of locomotives, but they quickly expanded to include the

manufacture of locomotives (1846), of goods wagons (1850), of rails (1861), and of passenger carriages (1867); expansion of all these facets of production continued over the following decades.²¹ Not only did the GWR need a massive ongoing building program, both for these works and for the further expansion of its railway network, but also the consequent growth of Swindon city called for that town’s own substantial program of residential, public and commercial building construction.

The move to Swindon was no doubt prompted or even necessitated by work opportunities in that city. Whether Baker was a GWR employee before – or even after – the move is not clear. It may have been undertaken simply to be closer to his place of work, or perhaps to take up a more attractive position. In any case, his new job in Swindon seems to have given him cause to consider the advantages of becoming his own master. Not only could he obtain greater rewards for the broad range of skills he had acquired as a builder’s clerk, but he could also focus on the more interesting and challenging aspects of his work.

Private practice

Within two or three years of taking up the Swindon position, Baker had made a decisive break. He went into partnership with one James Hinton, in the rather diverse business of ‘Auctioneers, Valuers, Architects, Surveyors, House, Estate and General Agents’, with premises at Regent Street, New Swindon. This partnership was not to last, however: it was dissolved on 31 December 1875.²²

With the partnership over, Baker branched out on his own at the beginning of 1876. From the range of services the partnership

had offered, he appears to have discarded only those of ‘auctioneer’ and ‘general agent’.²³ According to his 1881 census entry, however, his three most favoured functions appear to have been those of ‘architect’, ‘surveyor’ and ‘valuer’.²⁴ Amongst these, it seems his real ambition was to one day practise solely as an architect: his later career leaves little doubt that this was his real passion, and the inclusion of other services at this stage was doubtless to provide a fall-back position with some ‘bread and butter’ work in leaner times.

He had eased his way into architectural practice through the on-the-job accumulation, over twelve or so years as a builder’s clerk, of the necessary knowledge, skills, experience and confidence. Taking this practical-experience pathway into the profession, rather than through formal tertiary-level training courses, was not unusual at the time – it was in fact the norm. The introduction to the publication *Directory of British Architects 1834–1914* (Brodie 2001) makes the following observations on this matter:

The period between 1834 and 1914 witnessed a profound change in the nature of architectural practice in Great Britain ... Demand for new buildings led to an explosion in the number of people involved in the building trade, many of whom styled themselves ‘architect’.

Prior to the introduction of recognised Schools of Architecture early in the twentieth century and, ultimately, the Architects’ Registration Act of 1931, it is very difficult to define exactly what determined an architect during any given period and who, therefore, could legitimately use this title. Throughout the

nineteenth century many men who could perhaps more accurately be described as engineers or surveyors or builders described themselves as architects, while some individuals who would now be considered as such would not have viewed themselves in this way.²⁵

It is clear from this extract that we should not judge Orlando Baker’s competence by the absence of the formal qualifications that are expected today.

Professional output in the UK

Information about Baker’s architectural design work during his time in the UK is difficult to acquire without access to archives in Wiltshire, but it has been possible to identify two examples of his work from these years.

A few years after branching out on his own, he was commissioned to design the Workmen’s Institute building in the town of Purton, which lies about 5 km north-west of Swindon. The structure was erected over 1879–80, and was a gift to the town from a local philanthropist, James Sadler. It was constructed by Purton builder James Grey for £2000, and is nowadays the town’s library.²⁶ This gothic-inspired building is an impressive, well-designed structure and leaves no doubts about his capability as an architect. Fig. 2 is a photograph of the structure as it appears today.

Evidence of a second structure he designed, located in Swindon itself, comes from an 1889 Wiltshire directory, which provides the following description:

A Presbyterian Lecture Hall on the south side of Dixon street was built in 1885,



Fig. 2. Workmen's Institute, Purton (now the town library). Designed by Orlando Baker and constructed over 1879–80.

PHOTOGRAPHER MARK WHEAVER, 2010
FROM HIS 'CLANGER'S ENGLAND' SERIES

and is in the Early English style; the hall is 55 feet long and 28 feet 6 inches wide in the clear, with suitable porch, entrance and lobbies; it is lighted with gas and hot water laid on; the roof is ceiled at the collar beam, leaving exposed the principal timbers, which are stained and varnished; the floors of the session room and vestry are fire proof, with wrought iron joists and brick arches, covered with Lowe's patent wood block flooring; the hall can seat 300 persons. Mr. Orlando Baker M.S.A. of Regent street, New Swindon, was the architect.²⁷

Today, there is a Moravian Church – described as being built in 1880 as a Presbyterian church – on this site, with two

halls attached.²⁸ One of these halls is most likely that designed by Baker, but the church occupies the full street frontage, and the halls are obscured from view in the centre of the city block.

The listings for the 1881 census, taken on 3 April, reveal that his exact address was 38 Regent Street, which may even have been the New Swindon property in which he commenced his partnership with James Hinton nearly a decade earlier.²⁹ Regent Street is actually one of the city's main shopping thoroughfares, and many of the old nineteenth-century buildings still standing there comprise a downstairs shop premises with what were formerly residential quarters upstairs.³⁰ It would be reasonable to assume that Baker and his family resided in such a building, above the office for his business at street level. The same census entry listed his first son, Orlando George (then 16), as 'architect's assistant', giving us every reason to believe that the youth was working in his father's practice. The eldest daughter, Louisa Ann, had already left home and was married in Chippenham, about 20 km south-west of Swindon, in the September quarter of 1881.³¹

Baker's decision to continue offering a variety of different services proved to be sound, as these seem to have provided an important supplement to the income from his architectural work. Some evidence of this other work has come to light in the form of a map of Swindon he was commissioned to prepare for the *North Wilts Directory* of 1883.³² With his expertise in surveying and plan drafting, such cartographic work would have been a relatively straightforward undertaking.

Formal recognition as an architect

While the viability of his business may well have depended upon these supplementary pursuits, the primacy of architecture among his career aspirations was confirmed the next year, when he joined the Society of Architects.³³ This entitled him to use the professional designation 'MSA', for 'Member of the Society of Architects'. The commencement of his membership seems to have had little to do with any watershed in his working life: 1884 was actually the year in which the society was founded, and that year provided his first realistic opportunity to join a professional architects' organisation. Previously, the only body representing British architects had been the Royal Institute of British Architects (RIBA), which was founded by Royal Charter in 1834. In line with the UK's entrenched class system at the time, this was very much an elitist organisation, dominated by privileged members of society. Admission to membership was via a nomination process – a filter that could effectively exclude those lacking the necessary connections. The chances of access by men of humble origins, like Baker, might have been slim. Even within the Institute, there were two distinct classes of members: the 'Fellows', who had greater status and privileges; and the 'Associates'. The latter group was not allowed to vote on the Institute's affairs and, after failed attempts to achieve reform, a breakaway group in 1884 formed the more egalitarian Society of Architects as an entirely separate organisation. This society lasted until 1925 when, following various reforms to RIBA, the two organisations amalgamated under the RIBA banner.³⁴

Baker's name is listed in the publication *Directory of British Architects 1834–1914*, but his entry is a particularly meagre one, being based upon a single source – the 1896 Society of Architects membership list, which simply provided his Hobart address for that year and the year he joined the organisation.³⁵

Hobart (1890) – a new start

As the 1880s progressed, Baker's hopes of maintaining a viable architectural practice in Swindon must have been diminishing rapidly, for by the end of the decade he was prepared to abandon his homeland entirely and seek a supposedly greener pasture – Hobart, Tasmania – on the other side of the world. As late as 1889, he had been describing himself as 'architect, surveyor, valuer & house & estate agent, 38 Regent Street', suggesting that he still needed all the additional strings to his bow in order to survive.³⁶ If he was ever to operate solely as an architect, he had to make some dramatic changes in his life, but why he chose to relocate to such a remote destination as Hobart is a mystery. Perhaps he had received glowing reports from a relative, friend or acquaintance who had emigrated to or visited the city.

Hobart in the late 1880s was an attractive proposition for professionals in the building industry: after the best part of two decades in the doldrums, the 1870s and 1880s were boom times for architects. Henry Hunter, Tasmania's pre-eminent architect of the period, had a particularly flourishing practice: over those years, he won commissions to design around 15–20 major public and commercial buildings,

a similar number of churches, perhaps as many schools, and well over 30 grand private homes.³⁷ He left, permanently, for Brisbane in 1888 and died there in 1892. Other Hobart architects were doubtless also doing well over the period, and Hunter's departure would have opened up increased opportunities for them – opportunities that Baker too could have exploited.

He departed England's shores in 1890, at the age of 56, embarking on the Shaw, Savill & Albion Line steamship R.M.S. *Coptic* in early September, with his wife Louisa and his two unmarried children, Orlando George (then 25 years old) and Clara (23).³⁸ While the ship had 'cabin' and 'second saloon' accommodation, the Bakers were travelling 'third class' in the steerage area of the ship, along with a large majority of the other passengers. The choice of accommodation may well say something about the state of his finances at the time, but it may simply have been a matter of avoiding unnecessary expenditure. The ship came via Cape Town, calling in there on 28 September, and docked in Hobart on the evening of Saturday 18 October 1890, after a journey of 45 days.

When he disembarked in Hobart, Baker was no doubt optimistic about his prospects, but dark clouds were gathering on the economic horizon. A severe, nation-wide depression was about to take hold and would remain serious until at least the end of 1894. Its effects were to be exacerbated by an international depression that began in 1893, and the years 1891–93 in particular would see the collapse of many banks, other financial institutions and businesses across the country. On 3 August 1891, only nine months after

he arrived, the Bank of Van Diemen's Land closed its doors. Those who had large deposits, investments, loans, and mortgages with the bank soon found themselves in dire straits. Because many of these individuals were unable to pay their bills, a substantial 'knock-on' effect began to be experienced by others who had no direct connections with the bank. In the building industry, projects directly reliant on VDL Bank funds soon came to a halt. Other building activity decreased more gradually: most projects already under way or about to commence proceeded, but as they drew to a close funding for new work became increasingly difficult to obtain. Construction activity declined steadily over the course of 1892 and 1893 and the implications for Baker were to be serious.

These trying times still lay in the future, however: in October 1890, his first priority was to obtain suitable housing. His eventual aim was to acquire his own property, but in the meantime he had to find rental accommodation. His first-known residence was an unnumbered weatherboard cottage on 'Domain Road' (now 3 Aberdeen Street) in the Glebe, facing the open woodlands of the Queen's Domain. This dwelling still stands, in sound condition, although its original front is now completely obscured by extensions of twentieth-century origin.³⁹ (Fig. 3)

Once settled, Baker seems to have found good work fairly quickly, although whether he derived his income entirely from architectural work or from a combination of surveying, property valuations and architecture is not known. By late 1891, after only a year in the colony, he was in a position to



Fig. 3. The house in ‘Domain Road’ (now Aberdeen Street) on the Glebe, rented by Baker over the period circa late-1890 – early-1893. Its original front has been obscured by twentieth-century additions.

PHOTOGRAPHER M. KAYS, 2012

make a deposit on a building allotment: on 30 November, he attended an auction for a 23-block subdivision in Bellerive, securing the highly desirable Lot 13, which had frontages on Victoria Esplanade, Westbrook Street and Thomas Street.⁴⁰ The subdivision had been created by auctioneer Thomas Westbrook by partitioning the extensive gardens and surrounds of the substantial old home named ‘Rozel’, which was sold as part of the Lot 1 package. The sale price for Lot 13 was £180, with a 25% deposit (£45) required and the balance of £135 to be paid in three instalments (at 6, 12 and 18 months), at an interest rate of 6.25%. Although the VDL Bank collapse

had occurred three months earlier, Baker had clearly suffered no significant, direct effects at this stage and was obviously confident that he could meet these terms. (Fig. 4)

Shattered hopes – the worst years of the depression (1891–94)

Baker’s fortunes took a serious turn for the worse in early 1892. By then, the ripple effect of the depression in general and the VDL Bank collapse in particular had started to impact significantly on the building industry. When his first instalment for the Bellerive land fell due in June, he was unable to make his payment, and the interest owed began



Fig. 4. Lot 13 on the Rozel estate, Bellerive, outlined in red. Baker contracted to buy this prestige waterfront allotment in late 1891 and paid a £45 deposit. His fortunes declined, however, with the 1890s depression and he was unable to make his scheduled quarterly payments. He relinquished his option on the block, which was sold at a considerable loss. Note that the modern allotment boundaries (in green) bear little resemblance to those from the auction prospectus.

to steadily accumulate. December 1892 came and went, as did June 1893, still with none of the scheduled six-monthly payments made. By October 1893, the interest debt had grown to £15, and he accepted that his purchase was a lost cause. With the agreement of Thomas Westbrook, he put the allotment up for sale and attracted a buyer within a few months. Property values had however declined with the depression, and £150 was all he could get for the land – £30 less than the original sale price. This price was sufficient only to cover the total of the £135 principal and £15

interest owing, so all he had achieved was the elimination of his debt; he had effectively lost his £45 deposit.

In early 1893, well into his payment crisis with the Bellerive allotment, he relocated to a more centrally situated residence at 60 (now 72) Barrack Street in the inner city. It is not clear what prompted the move. This Barrack Street house was to be his home for the next sixteen years, suggesting not only that he was satisfied with the property but also that the owner – Joseph Omant, who lived in the substantial home just three houses down the road on the corner of



Fig. 5. The house at 60 (now 72) Barrack Street occupied by Orlando Baker from early 1893 until late 1909 or early 1910. The forward-jutting Federation-era extension on the left, with the gabled roof, is unlikely to have been added during his tenancy. It represents only a small addition to the original frontage, and seems to date from the period 1910–18 (see endnote 41).

PHOTOGRAPHER M. KAYS, 2012

Bathurst Street – considered him to be a good tenant.⁴¹ (Fig. 5)

Baker had faced very difficult circumstances over the years 1892–93, and little change could be expected in the economic climate for another year or so. He was definitely still representing himself as an architect at this time,⁴² but the chances of his maintaining a successful practice of his own or of obtaining useful paid work in another practice during these crisis years would have been slim. He would surely have had to rely upon supplementary

income from surveying and property valuation work, at the very least, in order to subsist.

A glimmer of hope (1894–97)

Conditions for his practice probably began to improve towards the end of 1894. One significant event for him in that year was the marriage on 28 August of his daughter Clara, then 27 years old, to Henry John Robertson.⁴³ The whereabouts of the son who had accompanied them to Tasmania – Orlando George, by then 29 years old – are

unclear at this time; it seems that he never married, and he appears to have lived most, if not all, of the rest of his life in Hobart, where he died in 1942.⁴⁴ If either or both of Clara and Orlando George were earning and had lived with their parents over the period 1890–94, the extra household income and the capacity to share the rent would have been hugely beneficial during those lean years.

In April 1895, Baker's only Tasmanian grandchild was born, to Clara and her husband Henry Robertson. The infant was named Arthur John Robertson.⁴⁵

Around this time, the prospects for Baker's practice seem to have recovered somewhat. Whether he was working entirely as an architect or still offering some surveying and valuation services has not been determined, but it is clear that he continued to refer to himself as an architect. Evidence for his activity is scant, but two advertisements relating to the same matter were placed in *The Mercury* in February 1896, revealing that his 'office' was in his home at 60 Barrack Street. The first was placed on 12 February, and the second – on Friday 21 February – stated:

TENDERS are Invited for Erection of an 8-Roomed BRICK HOUSE in Liverpool-street. Plans and particulars of Orlando Baker, M.S.A., Architect, 60, Barrack-street, to whom Tenders are to be delivered before 2 o'clock on THURSDAY, February 27 (time extended from February 22). The lowest or any tender not necessarily accepted.⁴⁶

The two advertisements are the only evidence of his Hobart practice so far found, and as no address was given for the planned Liverpool Street house, we

are denied the opportunity of seeing this example of his Tasmanian private work. Strangely, he seems to have eschewed some of the most basic opportunities to make the public aware of his availability to undertake architectural design work: in the *Tasmania Post Office Directory* entries, it was common practice for men to list their occupation next to their name, but in none of the relevant directories (those for 1892–93, 1894–95 and 1896–97) did he do so; also no advertisements for his practice have been found in *The Mercury* or the *Walch's Tasmanian Almanac* trades directory for the 1890s.

The almost total absence of evidence relating to Baker's design work during his time in private practice in Tasmania (November 1890 – September 1897) is hardly surprising, given that the four worst depression years (1891–94) were followed by another three of lingering effects. Whatever records he may have kept of his work were clearly lost or discarded after his death, as his living Tasmanian descendants had not even heard of him before the research for this article began.⁴⁷

Appointment as a draftsman with the PWD

When Baker placed the newspaper tender notices in February 1896, he was about 62 years old. Over the next year or so, he seems to have come to a realisation that his business, although allowing him to subsist, was not generating the income he needed to amass a nest-egg for his declining years. On 1 October of the following year he swallowed his pride and accepted an appointment as a draftsman with the Department of Public Works (PWD). His commencing annual salary of

£155 was rather meagre when compared with those of other staff in his branch of the department: of about 45 employees at that time, only a dozen were receiving lower salaries.⁴⁸ It nonetheless offered a steady, reliable income and the job was relatively secure.

While it was obviously in his interests to accept this appointment, it was equally in the Government's interests to employ him. For a relative pittance, they were securing the services of an experienced, highly competent, practising architect. The official 'government architect' position, actually titled 'Architect and Chief Draftsman', had been abolished back in 1892 after the resignation of the occupant, William Waters Eldridge (1850–1933). It had been a position of high status and salary (in 1892 it was third-ranked in the Works branch of the Lands and Works Department, with £375 annual pay),⁴⁹ and was probably terminated as a cost-saving measure in the face of the depression. Eldridge had designed many important buildings for the Government, and his services would have been sorely missed. When he resigned, his role was subsumed under that of J.G. Shield (1853–1926), the Inspector of Public Buildings.⁵⁰ Shield, to whom Baker became responsible, never identified as an architect, but in the early 1870s he had spent two years articulated to prominent Hobart architect Edward Casson Rowntree.⁵¹ Between then and when he joined the PWD staff in 1879, Shield had worked in a supervisory role in his father's building firm and may have done a small amount of design work, but all the major projects of the firm during those years – including the Royal Tennis Court, the Derwent and Tamar Assurance

Company building and St Mary's Cathedral – were designed and supervised by architect Henry Hunter. Once in the PWD, much of Shield's time was spent in the field, supervising the construction of government buildings, preparing reports, drawing up recommendations, etc., so despite his formal architectural training and extensive knowledge of building design, he probably had little opportunity to engage in any detailed design work. Baker's appointment therefore allowed the department to fill an obvious gap, albeit under the less prestigious label of 'draftsman' and for a bargain price.

Information about his output from his years with the PWD (1897–1911) comes from two sources: occasional newspaper items and the Tasmanian Archives and Heritage Office (TAHO) collection – unfortunately incomplete – of PWD architectural drawings for buildings either proposed or actually constructed under that department's direction.⁵² This latter source is by far the richest, as it presents a picture of the full scope of projects on which he is likely to have worked, and provides firm evidence of his role in specific projects. For any one major project, there were several sheets of drawings, together presenting a variety of plans, elevations and sections. Overall, there were well over 500 such items from the period being investigated in the TAHO collection.

The collection reveals, as might be expected, that the vast majority of projects were small scale ones that offered limited opportunity for impressive design work. These works comprised additions, alterations and extensions to existing government structures, large and small; and the erection of many small buildings,

such as combined schoolroom–residence and police-station–residence structures in rural localities. Along with his draftsman colleagues over the period (many of whom appear to have done at least some basic design work), Baker would have been responsible for his fair share of the designs for these routine works.

Because of the volume of this small scale work and the limited design challenges it offered, the quest for evidence of his work was mostly confined to searching amongst the drawings for projects perceived to be of a more significant nature. These comprised a variety of public buildings, major hospital works, government offices, larger school buildings and court houses in major centres.

Establishing a link between Baker and any particular set of these drawings was a matter of detecting the presence of his signature or initials, although the presence of other initials required an understanding of the relative roles of the officers involved. There seems little doubt that, in spite of those other initials, the drawings bearing his ‘mark’ do represent designs for which he deserved most or all of the credit. From 1900 onwards, the evidence becomes more conclusive. Before that year, he mostly just initialled, rather than signed, the final versions of the drawings for his designs; later it seems that he reserved initials solely for the earlier versions.⁵³ By 1900, he was confidently writing ‘O. Baker M.S.A. Arch^l’ on his final versions, in red or black ink, on the bottom right-hand corner of the drawings.⁵⁴ Occasionally, he omitted the ‘M.S.A.’. The final versions were used for contractual purposes, and each bears a declaration, signed by a senior PWD officer (usually J.G. Shield) and witnessed

by the building contractor, testifying to the fact that it is the one referred to in the building contract. These declarations were generally added some time after he had signed the drawings as the architect, and Shield’s signature reveals a ready acceptance of Baker’s identification as the architect.

The presence of other initials on these drawings reveals something about the contribution of Baker’s colleagues to his projects. There is good reason to believe that the drawings for many, if not most, of the buildings designed by him were prepared by other draftsmen working under his supervision. Differences in the calligraphy used in labelling diagrams on different sheets of drawings signed by him as the architect provide support for this contention. Additional evidence comes from the initials appearing, along with the date, in the oval ‘Public Works Department Tasmania’ stamp impression in the bottom right-hand corner of the final versions of all the drawings he had signed or initialled as the architect. These initials can always be matched with the name of one of his draftsman colleagues, and they can be reasonably interpreted as being those of the officer who prepared the drawings under his instructions. Prior to May 1899, for instance, the only initials found to be appearing in the stamp impression were ‘F.H.’, those of his colleague Frank Heyward, at that time the Junior Draftsman. Baker’s signature or initials, where present, always appear just to the right of this impression.

Apart from the architectural drawings, the other main source of information about significant works attributed to

Orlando was that of contemporary press articles. Newspaper reports that specifically identify him as an architect are, however, confined just to the years 1900–1902. That they appear at all is probably due to J.G. Shield's relationship with the press. As Inspector of Public Buildings, he was the senior PWD officer responsible for the Government's building construction program, and he served as the main spokesman on the Department's operations in planning, constructing, enhancing and maintaining government buildings. Articles quoting him or referring to his activities appear frequently – sometimes almost weekly – in Tasmania's main daily newspapers. Occasionally, these give him a share of the credit for new building designs, along with the PWD 'officers' (un-named) working under him,⁵⁵ but in Baker's case Shield appears often to have taken care to ensure that he was specifically named for his design work. This suggests that Shield held Baker's work in high esteem. Baker is unlikely to have initiated the press contacts himself: not only would it have been contrary to public service conventions for a relatively lowly ranked officer to publicise his achievements, but there is also no evidence of his use of the press to promote his services when he had the opportunity to do so in private practice.

During Baker's first twenty months with the PWD, his design work was confined to relatively routine tasks. Staff numbers in the Department were still recovering following the depression years, and up until May 1899 his only support was junior draftsman Frank Heyward, appointed at the same time as Baker, and

possibly J.T. Brown, whose very precise designation of 'specification draftsman' implies a limited role in the preparation of architectural drawings.⁵⁶ There can be no question, therefore, that Orlando was overwhelmingly responsible for the designs produced over this period. The TAHO collection of PWD drawings, although incomplete, paints a telling picture of their projects during this time, which at least included: three small school buildings, three teacher residences, five police residences, one block of police cells, a small country courthouse, and extensions and additions to two hospitals.

The Strahan public buildings (1899)

The year 1899 saw Baker receive his first significant assignment in his PWD job. This was the task of designing the grand Strahan 'Public Buildings' – actually a single, substantial structure – on Tasmania's west coast.

The building, erected over the course of the next twelve months by Hobart builder James Dunn for a sum of £3925, would have been a grand, impressive contribution to the townscape of any city or town in Tasmania, let alone an isolated – albeit then busy – port town on the island's west coast. Still standing and in relatively good condition, this substantial two-storey structure was designed to house the Post and Telegraph Office, the Customs House, the Marine Board, the Town Board and the Bonding Warehouse. Some idea of its size and the quality of its design can be gleaned from the Fig. 6 photograph, although is not evident that it is actually almost as deep as it is wide. It is a well-proportioned, symmetrical, relatively restrained design in the classical tradition.



Fig. 6. The Strahan Public Buildings, designed by Orlando Baker in 1899.

PHOTOGRAPHER N. LOVEJOY, 2011

Whilst there is a dearth of direct evidence from the time to confirm that Baker does deserve the credit for this building, it can be demonstrated beyond reasonable doubt, by a process of elimination, that it must be his work. If a private architect had been responsible, his signature and credentials would have appeared on the drawings, and contemporary press reports would most likely have mentioned his role; neither was the case. Within the PWD, Heyward the junior draftsman can be readily dismissed as a most implausible contender, and J.T. Brown – who was about to retire – can be ruled out because of the very specialised nature of his work. J.G. Shield, Baker’s supervisor, might possibly have contributed some general ideas, but the nature of his duties and responsibilities meant he could not have engaged in any

serious design work. The only other individual who warrants any consideration is Hedley Westbrook, appointed at the beginning of May – possibly around the time the design work would have started – as a temporary ‘architectural draftsman’.⁵⁷ Westbrook, then about thirty years old, had been transferred in from a position as a clerk in the Office of Taxes. He had previously worked in the Lands and Works Department (a predecessor of the PWD) in the early 1890s, apparently as a draftsman, but had relocated to the taxation office in November 1894.⁵⁸ While occasional press articles refer to him as an architect,⁵⁹ it is clear he had never practised as such in a professional capacity, as he had hitherto been employed full-time in the public service (and he actually transferred back to the Office of Taxes in February 1903).⁶⁰

His only known private ventures appear to have been voluntary tasks associated with his roles as an active member of the Bellerive Social Institute, for which he did some relatively trivial work in 1892,⁶¹ and the Bellerive St Mark's church congregation. For the latter group, he prepared a design in late 1896 for a new church, school and parsonage, but after many delays their building committee opted in 1902 to invite Alex North, a prominent Launceston architect with several Anglican church designs already under his belt, to prepare new plans.⁶² The church was constructed over 1903–04 to North's design. Given this background, any notion that Westbrook designed the Strahan building can be dismissed as an unlikely scenario. Besides, his salary on appointment was significantly lower than that of Baker at the time (£145, compared to £175), despite his much longer time in government service, which in itself says something about the relative status of the two men.⁶³ It seems highly likely that he was transferred into the position in order to assist with the more mundane design work while Baker devoted time to the Strahan project.

Baker's role in the Strahan project is further confirmed by the presence of his initials on the architectural drawings, which were probably prepared over the period May–July 1899.⁶⁴ Although Westbrook's initials also appear, they are in the oval 'Public Works Department Tasmania' stamp impression, along with the date 26-7-99, in the bottom right-hand corner of the drawings. As previously discussed, this seems to be an indication of who prepared the drawings under Baker's supervision.

It seems that Baker had made his mark with his design work on this building. He was thereafter to sign his major finished works with the designation of 'architect', countenanced and perhaps even encouraged to do so by his supervisor, and was soon to be entrusted with even grander projects.

Enter

Thomas Claude Wade Midwood

In September of the same year, a new officer was appointed to Baker's section of the PWD, as a replacement for J.T. Brown, the 'Specification Draftsman', who had just retired.⁶⁵ This appointment was especially noteworthy, as the individual in question was to produce the only known surviving images of Baker. The new officer, Tom Midwood (1854–1912), was 45 at the time and had relocated from a position in the Lands and Surveys Department he had taken up in 1895. He was intelligent, well-educated and from a prosperous family, but above all he was a free spirit with considerable talents in music and the visual arts. As a young man in the early 1870s, he had gone to sea in search of adventure and for a time toured the United States as part of a travelling musical company, before returning to Hobart and eventually marrying in 1883. He was a gifted player of the piano, banjo, guitar and mandolin, but is best remembered for his work as a cartoonist, graphic artist and wood sculptor. He produced many excellent cartoon caricatures of Hobart identities and public servants, including three of Baker, and introduced an element of levity into the staid public service atmosphere through his sense of humour.⁶⁶ His cartoons don't just provide us with glimpses of Baker's physical appearance: they also provide an



Fig. 7. The former Commonwealth ‘Custom House’ (now part of the TMAG complex) in Davey Street, facing Franklin Wharf. It was constructed over the years 1900–1902. Orlando Baker was undoubtedly primarily responsible for the design of this structure.

PHOTOGRAPHER M. KAYS, 2012

insight into his interactions with another architect, appointed the following year on a short-term contract. (Because of important contextual information relating to their interpretation, these cartoons are placed further on in the account, at chronologically appropriate points.)

Baker’s pièce de résistance: the Commonwealth Custom House

Baker’s next significant architectural assignment was work on the plans for the new Custom House in Davey Street, which was to be constructed in readiness for takeover by the newly created Commonwealth of Australia, following Federation in 1901. The design work was commenced around

the beginning of 1900 and completed in March of that year. (Fig. 7)

The primacy of his role in the design of this building is clear from the manner in which he signed the architectural drawings: on each he had written, in red ink, in the bottom right hand corner, ‘O. Baker M.S.A. Arch^t’.⁶⁷ The contribution of some ideas by his supervisor J.G. Shield cannot, however, be entirely discounted. As previously related, Shield had the necessary training and was certainly knowledgeable about the principles, styles and practice of building design. Shield’s involvement was declared in an article in *The Tasmanian Mail* (24 March 1900, p. 17), which stated: ‘The design, which,

by the way, is exceedingly handsome, and appropriate, has been prepared by Mr Shield, Inspector of Public Buildings, and Mr Orlando Baker, M.S.A., architect, of the Public Works department’.

If J.G. Shield did contribute to the design in any way, it was likely – given all the other demands on his time – to have been limited largely to some initial suggestions on the overall layout and style of the structure. Baker was, after all, an architect of proven ability and long experience, and doubtless would have felt quite content to undertake the design work without any intervention from his supervisor. Of course, Shield would have had the right of ‘last say’ if the two had differed on any design matters.

Construction of the building commenced in May 1900 and extended over about two and a half years, being completed in December 1902. At the time, it was described as being ‘built of freestone in a graceful combination of the Doric and Ionic orders’.⁶⁸ Recent commentators have labelled its style both as ‘Baroque Revival’ and as ‘Federation Academic Classical’, but the appropriateness of such terms is a matter for the reader to judge.⁶⁹ The building was leased to TMAG by the Commonwealth Government in 1994, and then ownership was formally transferred in 2004.

Thomas Searell: asset or rival?

Baker’s assignment to the Custom House project in early 1900 would, to some extent, have meant the loss for several months of his expertise, experience and guidance to the PWD’s design and drafting team at a time when the Government had an ambitious public building program. It was perhaps partly in response to this gap that a short-term placement, paid at a generous

daily rate, was made in the team. This appointment is of particular interest, as it sheds some light on the story behind one of Tom Midwood’s cartoon caricatures. The appointee was Thomas Searell, M.R.V.I.A., M.S.A., an accomplished, experienced architect.⁷⁰ He was to occupy the position for just the relatively brief period 29 January to 13 June 1900, on a casual daily rate equivalent to £300 annual salary (Baker’s at the time was only £190). Searell had made his mark with a number of high profile private commissions, including those for the monumental Tasmanian International Exhibition Building (Hobart) in 1893, the Public Offices building in Main Road New Town in 1897, and the Gaiety Theatre and adjoining hotel in Zeehan in 1898.⁷¹ Like Tom Midwood, he was also from an advantaged background, well-educated and musically talented – albeit with a strictly classical focus – but there the similarity ends.⁷² Newspaper items relating to Searell abound and create an impression of a man who was opinionated, outspoken, self-important and abrasive. He frequently voiced his opinions in letters to the press, seemed to attract many critics, and appeared to resort readily to civil litigation to achieve his ends.⁷³

Tom Midwood’s portrayal of Baker and Searell

Tom Midwood was a perceptive observer of human behaviour and, working in fairly close proximity to both Baker and Searell, soon became aware of tensions between the two men. Baker, seemingly a reserved, conscientious ‘quiet achiever’, would have had some cause to resent the higher pay rate enjoyed by Searell, but whether he

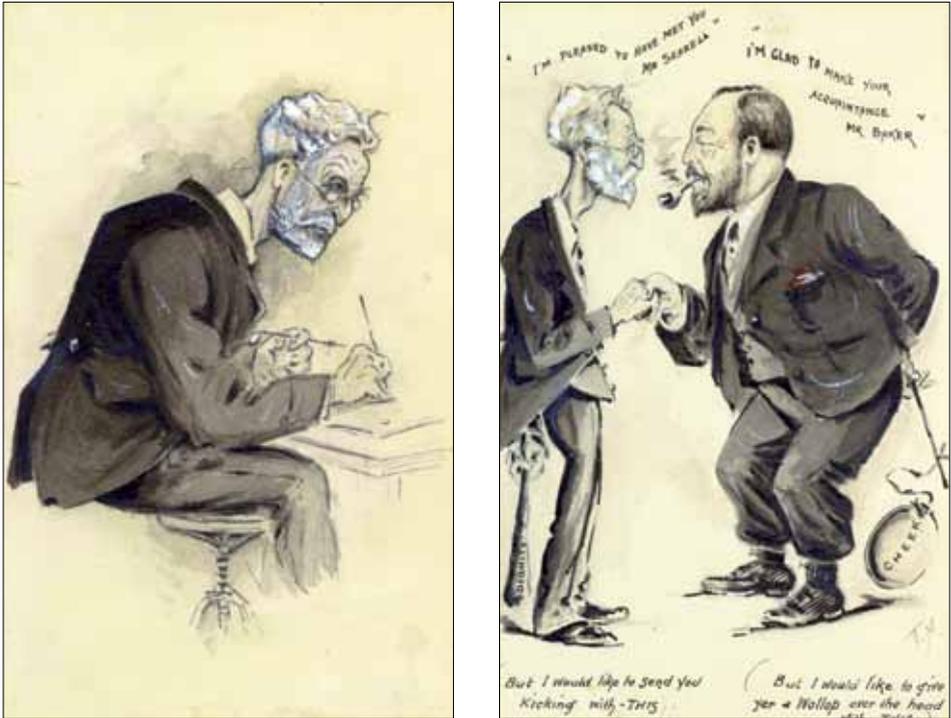


Fig. 8. Two Tom Midwood caricatures of Orlando Baker, the second with Thomas Searell, drawn around April–May 1900. The latter cartoon hints at the tension between the two men, and the word ‘dignity’ on Baker’s imaginary wooden club suggests a certain amount of empathy for him on the part of the artist. The word ‘cheek’ on the balloon held by Searell adds further credence to this notion. This cartoon was labelled, many years ago, as ‘Two civil servants in the Public Works disliking each other intensely’.

ever outwardly expressed such a sentiment we will never know. The self-assured Searell, given his prominent achievements to date and the fact that Baker was yet to establish a reputation in Tasmania, may well have considered himself to be the superior architect, and appears to have irritated Orlando with unwanted advice and commentary.⁷⁴

It was around this time – perhaps April–May 1900 – that Midwood penned

at least two of his cartoon caricatures of Baker, one of them with Searell.⁷⁵ Caricatures can be cruel, in that they exaggerate the subject’s physical features, but in Baker’s case they at least give us some insights to his appearance. He was apparently lean, stooped, bespectacled, white-haired with a high forehead and a short white beard, and had a prominent high-bridged nose. He was 66 years old by this stage. (Fig. 8)

Hobart GPO design competition

Baker's next venture, commenced in July 1900, entailed the preparation of a design for the exterior of Hobart's new GPO building, referred to at that time as the new 'Post and Telegraph Office'. The project had had a rather chequered history, in that a design competition had been announced for it back in June 1899, attracting nine entries – one from England, one from Brisbane, two from Sydney and five from Tasmania.⁷⁶ The winner, announced in December of that year, was local entrant Alan Walker, a gifted protégé of Henry Hunter.⁷⁷ Another of the local entrants had been Thomas Searell, and soon after the verdict was announced several letters under pseudonyms appeared in *The Mercury*, asserting that his design, which also had been rejected for second prize, was vastly superior to the winning one (could the author have been Searell himself?).⁷⁸ One critic responded by suggesting that Searell's plans were 'more suitable for a coffee palace than for a public office'.⁷⁹ The Searell campaign failed to make any headway, but the Government decided in any case that significant changes needed to be made, in terms of 'additional frontage', to the winning design. Its approach, in early July 1900, was to invite four of the original local contestants, including Walker and Searell, to submit new designs for the exterior – that is, new 'elevations' – with Walker's original floor plans being retained.⁸⁰ At the same time, the Government opted to submit its own design, prepared by Baker, retaining the option to use it, should it be judged to be the best.⁸¹ To ensure that the process of selecting the prize winners – five, based on order of merit – was highly objective, the judging task was given to the Victorian

Institute of Architects. The outcomes of the selection process were reported in *The Mercury* on 15 September, revealing that there had been eight different sets of drawings submitted by the architects (a number of them had presented two or three alternative sets).⁸² In the unanimous opinion of the judging panel, the order of merit for the best eight designs was: '1, Mr. Alan C. Walker; 2, Department Design; 3, Mr. Walker; 4, Mr. Searell; 5, Mr. North [Alex]; 6, Mr. Walker; 7, Mr. Searell; 8, Mr Searell'. The fact that an objective panel of experts had judged Baker's design to be second only to the best design of the talented Alan Walker and better than Walker's other two clearly demonstrates that he ranked among Hobart's most capable architects at that time. Also, given the apparent friction that had existed between him and Searell when they had worked together earlier in the year, it must have been particularly gratifying for Baker to have his design judged superior to any of Searell's.

Unfortunately for Baker, as a Government employee he was deemed to be ineligible for a cash reward for his work, and Alan Walker was therefore awarded both the first and second prizes, which amounted to £50 and £30 respectively; the three next designs in order received £10 each. The building was, as to be expected, constructed to Walker's design, over the years 1902–05.

The 'third-stage' extension to the Tasmanian Museum and Art Gallery building

Around September–October 1900, soon after completing his elevations for the GPO competition, Baker was allocated to



Fig. 9. The Macquarie Street frontage of the original TMAG building's third-stage wing (delineated with the dashed red line), constructed between January 1901 and May 1902. The structural aspects of the building's interior are today regarded as a highlight of Orlando Baker's design work.

PHOTOGRAPHER M. KAYS, 2012

design work on the other major structure with which his name is closely associated today. This was the 'third stage' extension to the original Henry Hunter designed Royal Society building on the TMAG site. This addition appears today as the left-hand, forward-set portion or wing of the Macquarie Street frontage of the building, but much of it is out of sight, as its depth into the city block is much greater than the width of its street frontage and it also 'wraps around' behind the first-stage section.

As with the Custom House, contemporary press reports create some uncer-

tainty regarding the relative contributions of Baker and J.G. Shield. In an article in *The Mercury* (21 March 1901, p. 3), concerning the laying of the foundation stone, it was declared that 'the architect is Mr J. Shields [sic], Director [sic] of Public Works ...'. Baker's name is notably absent here, but the oversight was redressed in a later article (*The Mercury*, 10 May 1902, p. 5), relating to the completion of the extension, which stated that 'the whole of the work has been satisfactorily carried out by the contractors, under the supervision of Mr. J. Shield, Inspector of Public Buildings ... and the architect, Mr. Orlando Baker'.

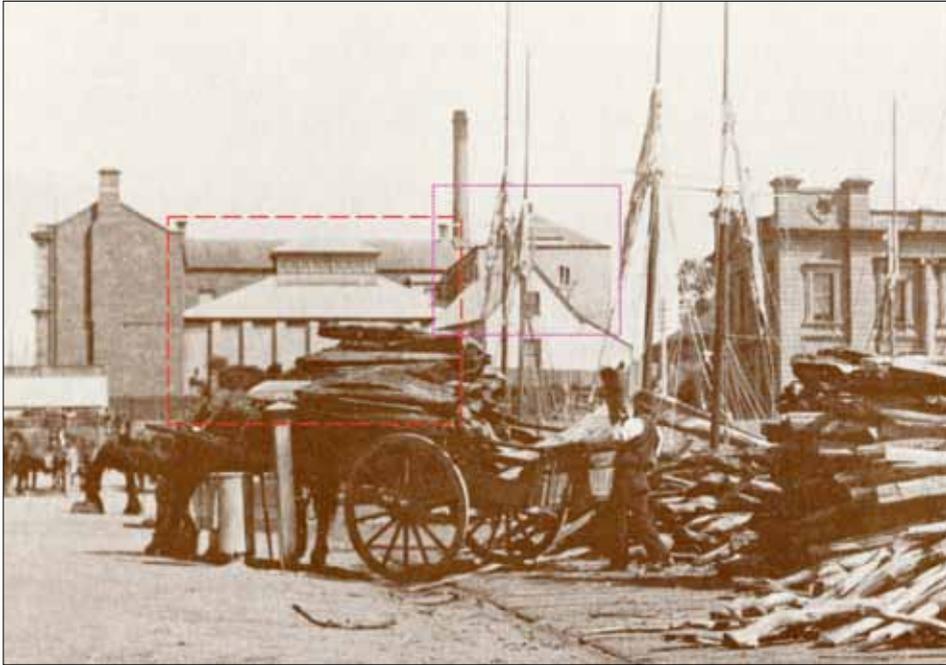


Fig. 10. A 1905–06 photograph showing the area behind the frontage shown in Fig. 9. It reveals the internally sited lantern-roofed gallery (delineated with the dashed red line), and also the back of the third-stage wing facing onto Macquarie Street (delineated with the dotted magenta line). To the right is a portion of the Custom House. Eventually, the lantern-roofed gallery was totally obscured by a new, much higher TMAG building on the corner of Argyle and Davey Streets, constructed over 1963–66. In 2012, the lantern roof was raised and an additional level inserted, featuring a cantilevered walkway.

PHOTOGRAPHER NOT IDENTIFIED

While the articles are contradictory in naming the architect, it can be fairly safely assumed that the situation was similar to that with the Custom House – that is, that J.G. Shield may have contributed some initial overall design suggestions, but Baker almost certainly deserved the majority of the credit for the design. This supposition is again supported by the manner in which he signed the drawings as architect.⁸⁵ (Fig. 9)

It should be noted, in any case, that the challenges involved in this instance were more a matter of structural engineering than of aesthetics. The appearance of the extension’s Macquarie Street frontage was dictated by the need to match the Henry Hunter designed facade of the wing to the right (out of the picture provided, on the corner of Macquarie and Argyle streets), thus leaving minimal scope for flexibility with the

‘public face’ of the structure. Also, the interior spaces had to be relatively clinical in appearance, as large, clear areas of wall space were required for displaying paintings, photographs and other exhibition material. The more demanding aspects of the design task were those arising from the necessity both to provide large areas of floor space unencumbered by columns and to supply as much natural lighting as possible. Structural steel was widely used, and in the upper-floor galleries truss-work of fine steel rods in the ceiling guaranteed minimal disruption to natural light entering from skylights above and, in one gallery, from an impressive lantern roof, while at the same time ensuring the structural integrity of the roof above. In recent times, these aspects of the building have been portrayed as highlights of Baker’s work: both the TMAG publication *Site* (Huxley 2008) and a recent *Mercury* article (18 June 2012) feature this element, with appropriate credit to him.⁸⁴ (Fig. 10)

Design work on the extension was completed when the plans were ‘signed off’ on 13 December 1900.⁸⁵ Tenders were called two days later, and construction commenced in mid-January 1901, with completion being achieved 16 months later, in early May 1902.⁸⁶

Despite the impressive design record Baker had established by the beginning of 1901, he was still officially classified as a draftsman, on an annual salary of £200. He was, however, the most highly paid of five employees with that designation, with a salary slightly above the median level for his branch. While it seems clear that he was effectively

the supervising architect, his prospects of reclassification to that status were negligible because of a salary freeze which was to remain in place until January 1908, when his pay was finally raised to £220.⁸⁷ Although his superiors in the PWD might have wished to reward his contributions with a more appropriate title and salary, their hands were tied by the freeze, which applied as much to them as it did to him.

Discarded plans: the Launceston Post Office tower

In January 1901, almost immediately upon finalising the plans for the TMAG building, Baker was allocated the task of preparing a suggested design for an alternative tower for the Launceston Post Office. The building had been designed by the former Government Architect W. W. Eldridge in 1885 and, after construction by the successful tenderer had stalled in its early stages, the contract was taken over by J. and T. Gunn, who erected it over the years 1887–89. From the outset, there had been widespread dissatisfaction amongst the people of the city with regard to the general design, and particular outrage had been generated by the fact that the prominent corner tower was constructed without provision for a clock, as originally intended.⁸⁸ Such was the level of agitation that the Government began to seriously entertain the possibility of demolishing and replacing the upper levels of the tower, and Baker was asked to come up with a proposal for a replacement. His design was featured in the *Launceston Examiner* in February 1901 and was described as being ‘in



Fig. 11. Orlando Baker's 1901 design for a replacement tower (delineated with the dashed red line) for the Launceston Post Office. No action was taken on his proposal, and the next year responsibility for the building passed to the Commonwealth Government. The top of the tower was replaced in 1909–10, using a different design.

harmony with the general character of the building, and it should be, both as regards utility and appropriateness, all that can be desired'.⁸⁹ (Fig. 11)

Despite the positive response to his proposal, no further action was taken by

the State Government, and in 1902 the Commonwealth Government assumed responsibility for the building. Finally, in 1908, a new design was chosen and a new tower top, with clock and bells, was constructed in 1909–10.⁹⁰

More routine projects (1901–07)

After February 1901, opportunities for engagement in serious design work on impressive public buildings appear to have lessened significantly. In October of that year, he was reported in the press to be working on the relatively mundane matter of proposed improvements – in particular ‘ditching and disappearing targets’ – for the Launceston rifle range.⁹¹ His preparation of a sketch plan for Hobart’s proposed isolation hospital around May 1902 was no doubt a more interesting challenge, but detailed design work was not required at that stage.⁹² The sketch was considered by the Hobart General Hospital’s board in early June, but his efforts were obviously wasted, as in August 1903 it was reported in the press, under the heading ‘Isolation Hospital’, that the former water bailiff’s residence had been converted to serve the purpose.⁹³ In 1903 one of his tasks was the preparation of plans for an ‘operating room and offices’ for the General Hospital.⁹⁴

These years, 1901–07, seem to have been marked by a dearth of major government building works, and they correspond roughly to the time in which the salary awards of PWD employees were frozen. It is fairly clear that this was a period characterised by tight government budgetary restrictions.

In 1904, there were some nominal changes in Baker’s status. On 1 January, his official title was changed from ‘Draftsman’ to ‘Chief Draftsman, Buildings’, and then on 1 July it was changed again to ‘Architectural Draftsman’.⁹⁵ He was to retain the latter title until he retired seven years later.

Private life – deaths and remarriage (1901–03)

In his private life, Orlando experienced a number of significant setbacks around this time. The first was on 26 August 1901, when his son-in-law Henry (‘Harry’) Robertson, husband of Clara, died an agonising death from tetanus after being bitten by a pig at the abattoir where he worked.⁹⁶ Widowed Clara never remarried and Orlando’s grandson Arthur, just six years old at the time, was left fatherless. Less than a year later, on 5 May 1902, his wife Louisa died, following a long and painful illness.⁹⁷ They had been together for 44 years and although Louisa’s passing ended a prolonged, difficult period during which her suffering and deteriorating health must have taken its toll on his own well-being, his sense of loss must still have been considerable. He was 68 years old at the time of this setback, but subsequent events seem to suggest that he was nonetheless undaunted in the pursuit of his long-term goals.

On 25 March 1903, less than a year after Louisa’s death, Orlando remarried. His new bride was Emily Rose Exley, who was 36 years his junior.⁹⁸ Emily was born in 1869, in Brighton (Tasmania), as one of nine children to Joseph and Emma Exley.⁹⁹ When she was twenty years old, she unfortunately became an unmarried mother. Her child – also named Emily – was born just twenty days after her 21st birthday, on 27 July 1890.¹⁰⁰ As an unmarried mother, Emily would have suffered considerable ostracism at that time, and would have had to take whatever work she could in order to support her child. By the time she and



Fig. 12. East Launceston Primary School in 2013, designed by Orlando Baker in 1906–07 as the ‘East Launceston Public School’.

PHOTOGRAPHER M. KAYS, 2013

Orlando decided to marry, she would have been 33 years old and her daughter twelve. Under normal circumstances their paths would have been unlikely to cross, but it is quite likely that she had actually been employed to nurse Louisa and do the household chores while he worked. Emily was from a fairly humble background, and employment as a ‘domestic’ – especially given her unmarried mother status – was probably the best she could have hoped for.¹⁰¹ If she was indeed employed as Orlando’s housekeeper, she may well have continued after Louisa’s death. However they may have met, some affection must have developed between them and their marriage would have helped fill voids in each other’s lives.

The East Launceston Public School (1906–07)

After an apparent ‘drought’ in opportunities to work on significant design tasks after 1900, Baker received a modest challenge when, in late 1906, he was allocated the task of preparing plans for the East Launceston Public School. In October of that year, he devised sketch plans for the consideration of parliamentarians; this was followed by the preparation of detailed drawings in early 1907, with the final versions completed on 8 March.¹⁰² The design is undeniably his, as the drawings are clearly signed with ‘O. Baker, M.S.A. Arch^r’. The building was constructed between May 1907 and February 1908 by the local firm J. and T. Gunn Limited, for a contract price



Fig. 13. The large allotment on the corner of Parliament and King Streets, upper Sandy Bay, purchased by Orlando Baker in mid-1907. In 1914, the block was subdivided to produce two additional allotments, corresponding to the current nos. 12 and 14 Parliament Street (see the boundaries and street numbers marked in green).

of £2890.¹⁰³ The floor plan was based on what was considered at the time to be an educationally sound formula – one that was to persist, with variations for school size, through the first three decades of the twentieth century. It comprised a structure enclosing three sides of a sealed quadrangle, with wide inward-facing verandahs giving direct external access to the classrooms.¹⁰⁴

With this basic recipe dictating the layout, his creative energy would have been directed instead to the exterior appearance and structural aspects of the building. Even in this regard, however, his options were limited by cost restraints and the utilitarian purpose of the building, and he opted for

a fairly plain design. As can be seen from Fig. 12, it comprised a symmetrical front, with wings jutting slightly forward at either side and featuring truncated gables (jerkin head roofs), along with a central, gabled entrance way. The sunshades above the windows along the western side are a modern addition.

Realising a dream – land and a home

In mid-1907, about four years into his new marriage, Baker finally managed to secure his own block of land. The owners of the grand, distinctive, Henry-Hunter–designed home *Selbourne* (built 1884),



Fig. 14. Orlando Baker's home – *Glenville* – on the corner of King and Parliament streets, Sandy Bay. Constructed over the period c. 1908–10, it represents the only known example of his private design work in Tasmania. Originally 70 'King Street West', its number was changed to 96 in 1914 and remains the same today.

PHOTOGRAPHER M. KAYS, 2012

in King Street, upper Sandy Bay, had been prompted by temporary financial difficulties to subdivide some of their extensive property, and he was able to obtain a large allotment on the corner of King and Parliament streets for £300.¹⁰⁵ He paid cash for the land, indicating that he had managed, despite his very modest salary, to accumulate some useful savings since joining the PWD a decade earlier. At that time, large parts of Sandy Bay were still given over to the agricultural activities that had characterised the area during the

1800s, with *Selbourne* being surrounded by orchards. The owners were Percy Abbot – a watchmaker and jeweller – and his wife Annie, and the purchase gave them crucial help with repayments on a short-term £1000 mortgage they had taken out the previous year in her name. (Fig. 13)

The next year, Baker embarked on his dream of building his own home on his new block. It can be safely assumed that it would have been erected according to his own plans and specifications.¹⁰⁶ Part way into the construction process,

he found his progress hampered by inadequate cash flow; his savings must have been running low and the labour and material costs accumulating at a greater rate than his income could sustain. He therefore took out a mortgage for £400, on 11 March 1909, with an interest rate of 5% applied.¹⁰⁷ The loan was to be repaid over the short time span of just three years, but he was obviously highly confident that he could make the required periodic repayments from his PWD salary, which was by then £220 per annum. The mortgagee also must have had reasonable confidence in Baker's longevity, even though he was by then 75 years old. As it transpired, it seems that he actually managed to pay out the loan at least a year early.¹⁰⁸ (Fig. 14)

His new home, which he named *Glenville*, was completed and occupied in 1910.¹⁰⁹ The building – a fairly substantial, two-storey structure – is of particular interest, as it is currently the only known example of Baker's private design work in Tasmania. It has a pleasing, albeit fairly restrained design, showing a blending of Victorian Italianate and Federation-era influences. Hints of the former style are evident in the faceted bays, the upstairs 'Venetian'-style grouping of three windows to match those in the bay below, and the general air of solid formality.¹¹⁰ Influences from the Federation era are evident in the decorative timber work of the verandah and the multi-paned upper sashes in the windows. It was – and still is – a relatively valuable house. The 1911 property valuation roll listed the total capital value of the property as £1075, comprising an 'unimproved value' of £325 and 'improvements' of £750.¹¹¹ In

comparison, the grand *Selbourne* property nearby had a higher total capital value of £1725 (with respective components of £725 and £1000), but most other listed properties in the vicinity had much lower capital values.

The Philip Smith Building

In the midst of the period when his house was being constructed, an article in *The Mercury* of Friday 28 November 1908, headed 'The Training College – Difficulty of Selecting a Design', stated:

The task of selecting a suitable design for a teacher's training college is proving much harder than was expected. In response to a request from the architects of Tasmania, the original design submitted by the Department of Public Works was laid aside, and competitive designs called for from Tasmanian architects. The internal arrangements of this original plan were practically to hold good and designs were only invited for the outward presentment.

About eight or ten designs were received from architects throughout the State, and the task of selection devolved upon a committee consisting of Messrs. Baker (Public Works Department), Dechaineux (Technical School), and Johnson (Training College). Dr. Elkington also examined the designs, and gave advice on points of light, sanitation, and matters within his province. The committee selected three designs, giving them in the order of their choice.¹¹²

This is the 'Philip Smith Building', adjacent to the Glebe on the Queen's Domain, which has served as a centre for the pre-service and in-service education



Fig. 15. Front view of the Elizabeth Street School building, designed by Orlando Baker in 1909 and now part of the Elizabeth College complex.

PHOTOGRAPHER M. KAYS, 2013

of teachers and other educators throughout its 100-year existence. It would be reasonable to assume that the original design submitted by the PWD was wholly or substantially the work of Baker and, if so, the internal design of the existing building can still largely be attributed to him. The article reveals the ongoing, effective pressure on the Government to open up the design process for its major buildings to public competition; it also tells us that Baker at least had a say regarding whose design was to replace his. The selection process, incidentally, did not end at this time: the lowest tenderer declined to do the work, and fresh designs were called for, with the successful applicant – Wilhelm Rudolf Koch – being announced in May 1909.¹¹³

Elizabeth Street State School

Baker's swansong in terms of major building design was the 'State School' in Elizabeth Street, North Hobart. It was conceived as a replacement for the overcrowded Trinity Hill School across Elizabeth Street, on the hill above. That school had been built to accommodate 380 students, but by early 1909 around 650 were attending, and urgent action was required. The ground plan and internal layout of the new school were dictated by principles set down by W.L. Neale, the reforming Director of Education appointed from South Australia at the beginning of 1905, and Baker's contribution was therefore largely concerned with the building's external appearance and structural characteristics. In layout, it followed the same basic Neale recipe as the East Launceston School – that is,

a sealed quadrangle open on one side and bounded by a wide verandah that provided direct access to the classrooms on the other three – although in this case it was a two-storey building with a balcony on the upper level above the verandah. It was designed to accommodate well over 800 children, making it more than twice the size of any other school in the state. A sketch plan was provided for the Minister of Education on 18 March 1909, followed by the final drawings – signed ‘O. Baker M.S.A. Arch^t’ – on 19 June.¹¹⁴ (Fig. 15)

Tenders for the erection of this building closed on 21 July, with the firm of Crisp and Gunn submitting the most competitive price. A moratorium was, however, almost immediately imposed on construction process by the State Government, newly elected at the beginning of May, in order to place the notion of a large central school under scrutiny.¹¹⁵ Approval was finally granted in mid-April 1910, with Crisp and Gunn commencing construction soon after, for a contract price of £8552.¹¹⁶ By September 1911 it was sufficiently completed for the teachers and their pupils to move in, although the formal opening was not scheduled until the end of the year.¹¹⁷ In addition to its formal title of ‘Elizabeth Street State School’, it was frequently referred to as the ‘demonstration and practising school’ in its early years, to reflect its additional function as a training institution for student teachers. It still stands today, in sound condition, as the central, oldest building on the Elizabeth College site.

Retirement and death

In early 1911 Baker had his 77th birthday. By then, his situation was reasonably



Fig. 16. Tom Midwood’s third caricature of Orlando Baker, not necessarily drawn at the same time as the two in 1900. It may, indeed, have been prepared many years later, and is perhaps a fitting image for his last departure from work when he retired on 30 June 1911.

secure – he was the owner of a fine home and would have been entitled to a small government superannuation pension on retirement.¹¹⁸ He decided it was time to go, and retired on 30 June. His farewell function was reported in *The Mercury* the next day, as follows:

Mr. Orlando Baker, who for nearly 13 years has been architect in the Public Works Department, retired yesterday, and the occasion was taken advantage of

to make him a presentation. On behalf of his fellow-officers, the Engineer-in-Chief (Mr. J. Fincham) presented Mr. Baker with a travelling rug and other accessories, and made a highly complimentary speech, which was borne out by Mr. J.G. Shield, Inspector of Public Buildings.¹¹⁹ (Fig. 16)

He did not have long to enjoy his retirement or his new home. Just 16 months after ceasing work, he died of heart failure. His passing was announced in *The Mercury* as follows:

DEATHS: BAKER. – Passed peacefully away on November 6, 1912, at his residence, 70 King-street West, Sandy Bay, Orlando, the dearly beloved husband of Emily Baker, and youngest son of the late Daniel Baker, of Brimscombe, Gloucestershire, England. No flowers by special request. “He giveth His beloved sleep.”¹²⁰

He had made his will in February of the previous year, and when probate was declared on 30 November 1912 his estate was valued at £1176.¹²¹ All but about £100 of that figure, however, lay in the capital value of his home. The estate was left almost entirely to his wife Emily, the only exception being a specification that ‘My dear son Orlando should have his grandfather’s watch together with my light-coloured violin and bow’. This reference to the violin is interesting, as it further broadens our image of a seemingly learned man who had risen well beyond the expectations created by his humble, ‘labouring class’ origins.

Apart from his wife Emily, Orlando was survived by three of his children: Orlando George and Clara in Tasmania (see below), and a daughter back in England.¹²²

Emily never remarried after Orlando’s death. She remained in their home, *Glenville*, for the next nine years, vacating the property around October 1921.¹²³ At first, the limited cash component of her inheritance would have threatened her long-term financial security, but she soon solved this problem by subdividing land at the rear of the property to provide two new allotments for sale. She sold these blocks, now numbers 12 and 14 Parliament Street, in 1914.¹²⁴ Her daughter, Emily jr., would have turned 21 before Orlando died, but no evidence of her fate has come to light.¹²⁵ At some stage – perhaps not immediately upon leaving *Glenville* – Emily moved in with her youngest sister Ada and her husband Frederick Brockwell in their home at 90 Molle Street, West Hobart. There, in her 75th year, she died following a prolonged illness on 25 November 1943.¹²⁶

Baker’s two Tasmanian-resident children, daughter Clara (Robertson) and son Orlando George, did not live to see Emily’s death. After Clara was widowed in August 1901, she found rental accommodation in a property in upper Bathurst Street, where she lived until 1908.¹²⁷ By 1905 at the latest, her brother Orlando jr., then working as a clerk, had joined her there and was probably sharing in the parenting of his nephew, Arthur (the grandson of Orlando sr.).¹²⁸ In 1908 Clara moved, with her then twelve-year-old son, to a different rental property, in Paternoster Row in North Hobart.¹²⁹ She was to remain there, at number 9, until her death on 9 April 1931, following an extended illness.¹³⁰ Orlando jr. seems to have lived with her there up till that time, as he was listed as the addressee for the property from then until his own death, at age 77, on 30 April 1942.¹³¹

Orlando Baker has a number of living descendants in this country. His only Tasmanian grandchild, Arthur John Robertson (1895–1970), married Mabel Eva Smith (1888–1983) on 3 September 1921, around the time Emily moved out of *Glenville*.¹³² They had one son and one daughter, both now deceased, who both married in the late 1940s and had two children each. Further generations have followed.

Through contact with a great-great grandson, born in 1950, it has been established with reasonable certainty that none of Orlando's living descendants had, at the time of the contact, any knowledge of him. This family 'amnesia' may well be traced to the probable alienation of his daughter Clara (the direct ancestor of all his Australian descendants), first by his marriage to Emily Exley and secondly by his will, through which Emily inherited his estate and Clara received nothing.

Conclusions

While Orlando Baker's contributions seem to have been highly valued by his colleagues in the PWD, there is no doubt that he had been exploited as a result of tight government spending policies that prevented him from being given a classification and salary commensurate with his actual role. For the whole thirteen years, he was classified and paid simply as a draftsman, even though he was clearly an architect, was performing duties that would have been carried out by the previous Government Architect and was constantly referred to in the press as such.¹³³ If he had been appointed and paid as the Government Architect,

we can deduce that his annual salary in 1911 would have been around £450 rather than the £220 he was paid (assuming that the salary of £375 for W.W. Eldridge in 1892 would have increased by the same proportion as that of J.G. Shield between 1892 and 1911), so he was certainly underpaid for the roles and responsibilities he was expected to assume. By the same token, of course, had the job of Government Architect been advertised and open for all and sundry to apply, he would not at that time have established the reputation needed to make him a strong candidate, so he was probably thankful that he was able to obtain the position that he did.

It is interesting to speculate on why such an obviously capable architect as Orlando Baker apparently never made a real success of private practice. It is quite clear that he was extremely competent and conscientious in his architectural design work, and could reasonably be described as being quite talented. Despite this, no evidence has emerged to suggest that he managed to maintain a flourishing private practice for any significant period of time. Partly, of course, this was just due to plain bad luck, as was the case during the depression years of 1891–94. But was there more to it? In preparing this account the writer gained a sense that Baker was a humble man who was happiest toiling at his drawing board in a back room, industriously preparing quality designs. His decision to discard auctioneering work from the list of services offered when he abandoned the partnership with James Hinton at the end of 1875 could well reflect a discomfort with work in

‘the limelight’. Also, entrepreneurial skills and self-promotional tendencies (not always admirable) do not appear to have been a significant part of his make-up – witness the lack of evidence of any attempt to advertise his practice in Hobart during the 1890s. Without the ability to effectively sell himself and his skills, his business prospects would have remained limited.

There will always remain the question of whether J.G. Shield made some contribution to the design of the Federation-era buildings on the TMAG site. If we were to rely entirely on the contemporary accounts in *The Tasmanian Mail* and *The Mercury*, we would have no choice but to conclude that Orlando Baker and John George Shield deserved equal credit for those structures, but the analysis presented in this account has established beyond reasonable doubt that, at the very least, the vast majority of the credit belongs to Orlando. The press articles nonetheless oblige us to accept, in the absence of evidence to the contrary, that J.G. Shield must have played some role in the design process. Whether he actually did we will never know: there is some reason to believe that, because he was the PWD’s press spokesman on its building activities, some journalists may have been inclined to see him as being responsible for its designs, when

it was actually a case of their having been prepared by staff working under his supervision.¹³⁴ All we can do is acknowledge, on the one hand, that the architectural training he had received as a young man and the rich knowledge of building design and construction he had acquired through his work over many years would have combined to make him a plausible contributor, whilst on the other hand conceding that the nature of his role and responsibilities in the PWD would have rendered him unlikely to have been able to do much more than contribute suggestions on broad matters of style and layout for the buildings.

It must be said that prior to the research conducted for this account, precious little seemed to be known about Orlando Baker. Not even his living Tasmanian descendants had heard of him. A few local architectural historians and others interested in Hobart’s built heritage would have associated his name with the former Commonwealth Custom House (now the TMAG administration block) and possibly the TMAG lantern-roofed gallery, but little more was known. It is hoped that the information presented in this account will now rescue him from a hundred years of obscurity and earn for him recognition as one of the better architects to practise in Tasmania over the last 200 years.

Acknowledgements

Special thanks are due to my dear wife Marilyn for her thoughtful and perceptive editorial feedback on the draft versions of this account. I also owe her a special debt of gratitude for her inspired recollection, when I mentioned that a new draftsman by the name of ‘T. Midwood’ had been appointed to Orlando’s section in the PWD, that he was the man responsible for a number of carved wooden caricatures now held in Hobart’s Narryna Heritage Museum. This recollection in turn triggered my memory that the same man had been responsible for a wonderful collection of cartoon caricatures of Hobart identities and public servants. This

serendipitous combination of events was to lead me to the only known surviving images of Orlando Baker.

Grateful thanks are also due to Mark Wheaver for permission to include his photograph of the Purton library building, to Noel Lovejoy for permission to include his photograph of the Strahan Post Office building, and to the staff of the University of Tasmania Library Special and Rare Materials Collection, for providing high-resolution images of the three Tom Midwood caricature cartoons of Orlando Baker. I am indebted to all these people for the very willing manner in which they contributed.

Endnotes

- 1 His exact birth date is yet to be determined and is likely to remain elusive, as it predates the 1837 commencement of civil registrations in the UK. The available evidence, however, favours a date some time in the March quarter of 1834. One definite, known date is that of his christening, which took place in the town of Stroud on 29 June 1834. This sets an obvious upper limit for his birth date. This limit is further reduced by his age given at each of the UK censuses from 1851 to 1881: these were conducted at ten-yearly intervals, all on dates in the range of 30 March to 7 April and, in conjunction with his christening date, must favour a birth-date in the March quarter of 1834. All of these census listings, along with that for 1841, actually state that his birth year *was* 1834, but there is plentiful evidence to suggest that the birth years were derived indirectly, simply by subtracting the age at the census date from the census year. A birth year of 1833, although unlikely, therefore cannot be ruled out entirely.

The specific, relevant references are:

- a His christening date – ‘England, Births and Christenings, 1538–1975,’ index, ‘FamilySearch’ (<https://familysearch.org/>

- pal:/MM9.1.1/NVGS-76T: accessed 16 April 2012), Orlando Baker (1834);
 b 1841 census entry – RG No. – HO107, Piece – 761, Book/Folio – 7, Page – 7, Reg. District – Aylsham, Sub District – Eynsford, Parish – Cawston, Enum. District – -, Ecclesiastical District – -, City/Municipal Borough – -, Address – Chapel Street, Cawston, County – Norfolk;
 c 1851 census entry – RG No. – HO107, Piece – 1967, Book – 142, Page – 25, Reg. District – Tetbury, Sub District – Minchinhampton, Parish – Minchinhampton, Enum. District – 1G, Ecclesiastical District – Brimscombe, City/Municipal Borough – Stroud, Address – Minchinhampton, Stroud, County – Gloucestershire;
 d 1861 census entry – RG No. – RG09, Piece – 1777, Book – 85, Page – 1, Reg. District – Stroud, Sub District – 6 Minchinhampton, Parish – Minchinhampton, Enum. District – 6, Ecclesiastical District – Brimscombe, City/Municipal Borough – -, Address – Brimscombe, Minchinhampton, County – Gloucestershire;
 e 1871 census entry – RG No. – RG10, Piece – 1881, Folio – 103, Page – 17, Schedule – 87, Place – Swindon, Wiltshire, Civil Parish –

- Swindon, Enum. District – 14s, Ecclesiastical Parish – Swindon, City/Municipal Borough – Swindon, Address – 23 North Street, Swindon, County – Wiltshire;
- f 1881 census entry – No. – RG11, Piece – 2020, Book – 121, Page – 9, Reg. District – Highworth, SubDistrict – Swindon, Parish – Swindon, Enum. District – -, Ecclesiastical District – -, City/Municipal Borough – -, Address – 38 Regent St., Swindon, County – Wiltshire.
- 2 The England and Wales Census listings for 1851, 1861 and 1871 (op. cit.) all give his birthplace as Minchinhampton, but the 1881 census and his death notice in *The Mercury* (7 November 1912, p. 1) give it as Brimscombe. The two rural hamlets are only 1.5 km apart, and his family may even have lived somewhere in between the two.
 - 3 Parent information is from Orlando's christening entry (op. cit.) and the census listings of 1841–81 (op. cit.); sibling comparisons are based on information from the 1841 and 1851 census listings.
 - 4 1841 census entry (op. cit.); ages for adults at this census were rounded to the nearest five years, and the stated birth years (which were calculated by subtracting the age from the census year) were therefore particularly imprecise; the birth years quoted in the text were therefore taken from the 1851 census entry – op. cit.
 - 5 'Certified Copy of an Entry of Death' (death certificate), from the General Register Office, UK, App. No. 4546740-2, DYD 416975, for death of Theophilus Baker, male, shoemaker, on 16 December 1847, aged 20 years, in 'Minchin Hampton'; registered 20 December 1847 in District of Stroud, Sub-district of Minchinhampton (informant: Daniel Baker, father).
 - 6 Both his mother's and father's birthplaces (Stroud and Leonard Stanley, respectively) were taken from the census entries of 1851 (op. cit.).
 - 7 Details from 'Stroud', Wikipedia article, on <http://en.wikipedia.org/wiki/Stroud>, history section, accessed 19 November 2012.
 - 8 1841 census entry for Orlando Baker – op. cit.
 - 9 The evidence for the family's homecoming prior to this time comes, unfortunately, from the UK death registry entry for Theophilus (op. cit.).
 - 10 1851 census entry for Daniel and Charles – RG No. – HO107, Piece – 2043, Book – 154, Page – 57, Reg. District – Upton upon Severn, Sub District – Hanley Castle, Parish – Great Malvern, Enum. District – 5B, Ecclesiastical District – -, City/Municipal Borough – -, Address – York House, Great Malvern, County – Worcestershire.
 - 11 1851 census entry for Orlando Baker – op. cit.
 - 12 *ibid.*
 - 13 'Certified Copy of an Entry of Marriage', from the General Register Office, UK, App. No. 4546740-1, MXF 847569, for marriage of: Orlando Baker, male, 24 years, bachelor, general clerk, resident of Brimscombe; to Louisa Antill, female, 24 years, spinster, resident of Brimscombe. (Respective fathers listed as: Daniel Baker, stonemason; John Stephen Antill, labourer.)
 - 14 Her birthplace is given as Bisley in the census entries of 1851 (op. cit.), 1861 (op. cit.) and 1871 (op. cit.), but in the 1881 census entry (op. cit.) it is listed as Chalford. Her birth year is derived from the same sources.
 - 15 1861 census entry for Orlando Baker – op. cit.
 - 16 From the Wikipedia entry for Stroud, at <http://wikipedia.org/wiki/Stroud> (accessed 14 June 2012).
 - 17 For all six children the birth date source is the Civil Registration Index of births, marriages and deaths for England and Wales, specifically: Louisa Anne – Stroud, September 1861 quarter, Vol. 6A, p. 297; Martha – Stroud, June 1863 quarter, Vol. 6A, p. 307; Orlando George – Stroud, March 1865 quarter, Vol. 6A, p. 309; Lucy & Clara – Stroud, June 1867 quarter, Vol. 6A, p. 338; Arthur – Stroud, September 1869 quarter, Vol. 6A, p. 320. Note that the 1881 Census listing gives the wrong birth year for Lucy & Clara (1868, rather than the correct year of 1867) and for Arthur (1870 rather than 1869). These incorrect years were probably derived simply by subtracting their ages at the census date from the census year.
 - 18 The move must have taken place between the September quarter of 1869 (when Arthur's birth was registered in Stroud) and 2 April 1871, when the census entry (op. cit.) showed Orlando living in Swindon, as a builder's clerk, and living at 23 North Street.
 - 19 1871 census entry for Orlando Baker – op. cit.
 - 20 Brunel: Isambard Kingdom Brunel (1806–59), the great nineteenth-century British industrialist.
 - 21 From 'Swindon Works', Wikipedia article on http://en.wikipedia.org/wiki/Swindon_Works, accessed on 14/06/2012.
 - 22 *The London Gazette*, 21 January 1876, p. 269.
 - 23 *Kelly's Directory of Wiltshire*, 1889 edition, Kelly and Co., London, p. 1022 (Commercial listing – New Swindon) – entry: 'Baker Orlando, architect, surveyor, valuer & house & estate agent, 38 Regent street'.
 - 24 1881 census entry for Orlando Baker – op. cit. Space limitations on the form undoubtedly forced him to make choices when describing his occupation.
 - 25 Brodie, Antonia (2001) *Directory of British Architects 1834–1914*, British Architectural Library, Royal Institute of British Architects, London, p. xiv.

- 26 Richardson, Ethel M, n.d., *The story of Purton; a collection of notes and hearsay*, www.ebooksread.com, p. 63.
- 27 *Kelly's Directory of Wiltshire*, 1889 edition – op. cit., in this case p. 1015.
- 28 Information from the webpage 'Swindon Moravian Church', on <http://moravians.co.uk/index.php/uk-congregations-list-for-the-moravian-church/western-district/swindon> (accessed 31 January 2013).
- 29 1881 census entry for Orlando Baker – op. cit.
- 30 From *Swindon Rate Books 1865, 1867, 1868, 1869 (and) Magistrates' Court Books 1915-1924*, transcribed & edited by Jean Cole 2002, collated & arranged by Rosemary Church 2008, published and printed by Wiltshire Family History Society, 10 Castle Lane, Devizes, Wiltshire SN10 1HJ, copyright Jean A. Cole & Wiltshire Family History Society, p. 3, (in 'Introduction to Rate Books', pp. 2-4), para. 2.
- 31 Civil Registration Index of births, marriages and deaths for England and Wales, District – Chippenham, September 1881 quarter, Vol. 5A, p. 116. The marriage was to John Tanner.
- 32 *Swindon Rate Books ...* – op. cit.; also *Swindon Advertiser*, 4 May 2011, 'Remember When: Photographic show reveals Swindon's Back Garden', by Frances Bevan in 'Looking Back'.
- 33 Brodie, A. (2001) op.cit., Vol. 1 (A–K), p. 96.
- 34 Paragraph based mostly on information from Wikipedia 'Society of Architects' article, accessed 16 April 2012, at: http://en.wikipedia.org/wiki/Society_of_Architects, which cites its source as the RIBA archives at the British Architectural Library. The existence of the nomination process was determined from Brodie, op. cit.
- 35 Brodie, A. (2001) op.cit., Vol. 1 (A–K), p. 96.
- 36 *Kelly's Directory of Wiltshire*, 1889 edition – op. cit., p. 1022.
- 37 Information compiled from: Walker, Alan C. (ARIBA) 1928, 'Henry Hunter and his Work', in *Report of the Nineteenth Meeting of the Australasian Association for the Advancement of Science*, Hobart Meeting, January 1928, ed. Lord, Clive E., published by the Association, Sydney NSW, 1929; pp. 419–425.
- 38 *Launceston Examiner*, 20 October 1890, p. 2, and Tasmanian Archives and Heritage Office (TAHO) item No. MB2/39/1/42, specifically 'Return of the arrival at the port of Hobart of the R.M.S "Coptic", October 18th 1890'. The accompanying children were not specifically named in the TAHO item, and only Orlando jr. was named by the *Examiner* article. They were confirmed by a process of elimination from UK marriage records (Louisa, m. 1881; Martha, m. 1887; Lucy, m. 1890; Arthur, m. 1888) and from subsequent events in Tasmania. Clara went on to marry in Hobart in August 1894 (TAHO – RGD37, No. 227 of 1894), but there is no record of a Tasmanian marriage for Orlando jr.
- 39 *Tasmania Post Office Directory* (H. Wise & Co., Hobart) for 1892–93 places him at this address. The previous edition, for 1890–91, was published before he arrived in Hobart. Entries in the annual property assessment (valuation) lists of the Tasmanian Government publication entitled *The Hobart Gazette* for 5 January 1892 and 3 January 1893 imply that he had probably relocated to Barrack Street fairly early in 1893.
- 40 The information relating to Orlando's purchase of this allotment is derived from a combination of two sources: (a) General Law Property Deed Volume 9, Folio 1546, finalised on 22 February 1894; and (b) an advertisement in *The Mercury* of 21 November 1891, p. 4, placed by Westbrook, Abbott & Co. and providing full details of the allotments and terms of sale.
- 41 Numerous sources confirm that he was living at 60 Barrack Street over this period. The most detailed ones are the annual property assessment (valuation) lists in the Tasmanian Government publication entitled *The Hobart Gazette*. The entry for 5 January 1892 shows that the previous tenant was still in residence, but that for 3 January 1893 reveals that the property had fallen vacant. The entry for 2 January 1894 lists Orlando as the occupier, so it is likely that he had moved in fairly early in the previous year, soon after the house became available. Checks for selected years thereafter – with the entries of 1 January 1896 and 20 November 1900 – confirm that Orlando continued to be the tenant, with Joseph Omant as the owner. The death notice for Orlando's wife Louisa, in *The Mercury*, 6 May 1902, p. 1 confirms that he was still there at that time. Further confirmation is provided by editions of the *Tasmania Post Office Directory* (H. Wise & Co., Hobart) for 1894–95, 1896–97, 1904, 1906, 1908 and 1909. Oddly, he was not listed in 1903 or 1907. Matching of this house with the current no. 72 Barrack Street was achieved through use of the Hobart Metropolitan Drainage Board plans (held by TAHO) for 1905–10. These plans show that the 'Federation-era' extension was not present at that time. In 1904, the Bathurst Street address of Joseph Omant was no. 185, on the corner of Barrack St.
- 42 General Law Deed 16/6240 – property title conveyance dated 23/7/1924.
- 43 TAHO: RGD37 – 227/1894, marriage record for Clara and Henry John Robertson, married 28 August 1894.
- 44 The 1903 Commonwealth Electoral Roll shows him living at 249 Bathurst Street, West Hobart;

- General Law Deed 16/6240 (op. cit.) shows him purchasing a property in Argyle Street in 1924; and the *Tasmania Post Office Directory* (H. Wise & Co., Hobart) for the years 1932–42 shows him living at 9 Paternoster Row, North Hobart. His death details are from *The Mercury*, 1 May 1942, p. 4.
- 45 TAHO: RGD33 – 1051/1895, birth record for Arthur John Robertson, born 22 April 1895, in Hobart.
- 46 *The Mercury*, 21 February 1896, p. 1.
- 47 From personal communication with a great-great grandson of Orlando, c. March 2013.
- 48 This information and all subsequent details about job classifications and salaries were extracted from the original hand-written journals kept by TAHO under the series number AUD17/1, and titled *Registers of the payment of salaries and other allowances to officers of public authorities*. The specific journals used were in the range AUD17/1/23–AUD17/1/47, covering the years 1887–1912.
- 49 *ibid.*, but specifically AUD17/1/28, covering 1 January – 31 December 1892.
- 50 On the *Pillars of the Nation* website (<http://www.pillarsofanation.com.au/architects2.html> – accessed 2/10/2012), it is stated that ‘At the time of Eldridge’s retirement William Hartnell was the Director of Public Works and Commissioner of Main Roads. Eldridge’s position was not continued; J.G. Shield, who had served as Inspector of Public Buildings since 1879, continued in that role ...’. (The site presents a synopsis of the careers of the colonial-era state architects for each state and includes specific entries for both Orlando Baker and John George Shield.)
- 51 *Cyclopaedia of Tasmania, vol.1, An Historical and Commercial Review*, Maitland and Krone Publishers, Hobart 1900, p. 138. The approximate years have been determined through reference to known projects on which he had worked with his father’s firm. E.C. Rowntree (1811–1893) was responsible for the design of such significant structures as the Richmond Congregational Church (built 1873–74), the old Hobart Savings Bank headquarters building in Murray Street (built 1857, and recently the focus of the ‘red awnings’ controversy), the Ebenezer Chapel building, later Queen’s College (built 1869–70, opposite the RACT in Murray Street), the New Town Methodist Church (built c.1858), the Sandy Bay Baptist Church, originally Queenborough School (built 1856–57), and Lenna in Battery Point (which was constructed from a composite of his plans).
- 52 The TAHO series in question is coded PWD266/4. These drawings are one component of a large collection of PWD archival material held by TAHO. The most substantial component of this accumulation – the the correspondence files for buildings constructed under PWD management – proved to be unhelpful in the quest for information about Baker. They were essentially a repository for correspondence with building contractors and other stakeholders, along with contractual documents and notes by various PWD personnel. Some contained only the contract documents. (For example: PWD18/1/3674 [‘62 Vic 59 Item 4015 – Post and Telegraph Office, and Customs, Strahan’, the Strahan ‘Public Buildings’].) A review of the files for structures previously known to have been designed by Orlando failed to reveal any reference to his role, making it clear that further investigation of this resource was unlikely to be fruitful. (This TAHO series is coded PWD18.) The specific file item numbers for some of his most significant works are: PWD18/1/3991 (‘63 Vic 41 Item 4353 – New Custom House Hobart’), PWD18/1/4358 (‘64 Vic 63 Item 4745 – Additions to Museum and Art Gallery, Hobart’) and PWD18/1/3674 (‘62 Vic 59 Item 4015 – Post and telegraph Office, and Customs, Strahan’ [the Strahan ‘Public Buildings’].)
- 53 The observations regarding the use and appearance of his initials during these early years (October 1897 – December 1899) are, of course, based on a sampling of the drawings. (Note that not all of the drawings held in the TAHO collection were final versions.) Those studied (TAHO references) included:
 PWD266/4/6682 Plan – Gormanston Court House; Drawing No. 4357-1 Elevations, Section; earlier version (4 May 1898) and final version (20 December 1898);
 PWD266/4/3807 Plan – Burnie Police Buildings, Constables’ Residences; Drawing No. 4342 Elevations, Sections (This case is actually a little different from the others, as it appears to be an earlier version on which he initialled a note stating that extra copies had been made.);
 PWD266/4/3368 Plan – Wesley Vale State School & Residence; Drawing No. 4359 Plans, Elevations, Sections; earlier version (29 November 1898) and final version (17 December 1898);
 PWD266/4/3369 Plan – Strahan Public Buildings; Drawing No. 4393-1 Elevations;
 PWD266/4/3370 Plan – Strahan Public Buildings; Drawing No. 4393-2 Roof Plan, Floor Plans; and
 PWD266/4/3368 Plan – Strahan Public Buildings; Drawing No. 4393-3 Block Plan, Sections, Details.

- 54 See, for instance:
National Archives of Australia, item P1715, 4442 7, Architectural drawing – Customs House, Hobart, Tasmania – front elevation (Davey Street), and TAHO items – PWD266/4/4643 Plan – Tasmanian Museum and Art Gallery – Additions; Drawing No. 4488-3 Elevations; PWD266/4/349 Plan – Public School East Launceston; Drawing No. 4676-1 Plan, Sections, Elevations.
- 55 See, for instance, *Examiner* (Launceston), 20 January 1900, p. 9 – ‘North Launceston State-school’, which states that ‘The plans were prepared by Mr. Shield and the officers of the Public Works Department’.
- 56 This information is specifically from the government salary journals coded by TAHO as AUD17/1/33, AUD17/1/34 and AUD17/1/35, covering the years 1897, 1898 and 1899 respectively.
- 57 Government salary journal for 1899, TAHO: AUD17/1/35.
- 58 *Launceston Examiner*, 3 November 1894, p. 6 – ‘Ministerial and Departmental’ item.
- 59 See, for instance: *The Mercury*, 8 July 1892, p. 3 – ‘Bellerive Social Institute’; and *Launceston Examiner*, 4 December 1896, p. 2 – ‘Bellerive’ (St. Mark’s Church meeting article).
- 60 *Examiner* (Launceston), 24 February 1903, p. 5 – ‘“Gazette” Notifications Hobart’. It is clear that he continued in public service well beyond that year – see *The Mercury*, 29 April 1905, p. 6 – ‘Bellerive’ article.
- 61 *The Mercury*, 8 July 1892, p. 3 – ‘Bellerive Social Institute’. This article refers to his supervision, as ‘an architect’ of the construction of a reading room and caretaker’s quarters, but does not make it clear whether he actually designed them.
- 62 This information has been synthesised from a number of sources: *Launceston Examiner*, 4 December 1896, p. 2 – ‘Bellerive’ (St. Mark’s Church meeting article); *The Mercury*, 4 February 1897, p. 2 – ‘New Church at Bellerive’; Sargent, J. R., (c.2007) *St. Mark’s Bellerive: reflections – looking forward, looking back*, published by the author, Bellerive, Tasmania, p. 82; *The Mercury*, 11 August 1902, p. 1 – advertisement (call for tenders for the church, by Alex North, architect); *Examiner* (Launceston), 23 November 1903, p. 6 – ‘Hobart & South. St. Mark’s, Bellerive. Laying of Foundation Stone’.
- 63 Government salary journal for 1899, TAHO: AUD17/1/35.
- 64 The drawings in question are (TAHO references): PWD266/4/3369 Plan – Strahan Public Buildings; Drawing No. 4393-1 Elevations; PWD266/4/3370 Plan – Strahan Public Buildings; Drawing No. 4393-2 Roof Plan, Floor Plans; and PWD266/4/3368 Plan – Strahan Public Buildings; Drawing No. 4393-3 Block Plan, Sections, Details.
- Strangely, Orlando did not initial these drawings until 29 July 1899, the day after J.G. Shield and the building contractor, James Dunn, had signed the declarations thereon, in confirmation of the fact that they were the plans referred to in the contractual agreement of 28 July. This is a decidedly odd state of affairs, as it could be expected that he would have had little cause to revisit the drawings once they had been ‘signed off’ as the final versions for the contract. Perhaps J.G. Shield had noted the absence of any attribution when signing the plans the day before and, in recognition of their excellence, actually encouraged Orlando to initial the plans.
- 65 Government salary journal for 1899, TAHO: AUD17/1/35.
- 66 These biographical details are from: *The Mercury*, 3 May 1928, p. 10 – ‘Photographic Society “Tom Midwood and his caricatures”’; and the website ‘Thomas Midwood exhibition – University of Tasmania Library’, at <http://www.utas.edu.au/library/exhibitions/midwood/biography.html>, accessed 28 May 2013. This particular web page is one of a number accessed from the more general Midwood exhibition site. Titled ‘Thomas Midwood, 1854–1912’, it includes a brief timeline for him and the notes prepared by Professor Emeritus Michael Roe for his speech launching the exhibition, which was held on 26 May 2008. Midwood’s light-heartedness, incidentally, even emerged in his drafting work: when preparing site plans that included areas of parkland or wooded landscapes, he would weave stylised human faces into the representations of tree foliage.
- 67 National Archives of Australia, record series P1715,1 – ‘Drawings – Commonwealth buildings Tasmania – Hobart Customs House’, see for example item 1178115 (‘Custom – House Hobart’; Front Elevation).
- 68 *The Mercury*, 19 December 1902, p. 2.
- 69 [1] The ‘Baroque Revival’ label was first applied to this building in: Hughes, P.J., Huxley, J.K., Judd, C.D., Walker-Smith, G.K., Hammond, C.A. & Rozefelds, A.C. (eds) (2007), *Collection: Tasmanian Museum and Art Gallery*, Tasmanian Museum and Art Gallery, Hobart, Tasmania, pp. 10 & 22. [2] The source of the ‘Federation Academic Classical’ label was: Apperly, R., Irving, R. & Reynolds, P. (1989), *A Pictorial Guide to Identifying Australian Architecture: Styles and terms from 1788 to the present*, Angus & Robertson Publishers, Eden Park, NSW, pp. 100–103. The

- writers actually use the Custom House as their prime example of the style.
- 70 Government salary journal for 1900, TAHO: AUD17/1/36.
- 71 See: *The Mercury*, 14 February 1893, p. 3 – ‘Letters to the Editor, Re Hobart Exhibition Competition’; *Launceston Examiner*, 22 March 1894, p. 3 – ‘Tasmanian International Exhibition, 1894–95’; *The Mercury*, 5 November 1897, p. 4 – ‘Town Board of New Town’; *The Mercury*, 16 December 1897, p. 3 – ‘Public Offices at New Town’; *Zeehan and Dundas Herald*, 10 October 1898, p. 3 – ‘The Gaiety Music Hall’; and *Zeehan and Dundas Herald*, 1 November 1898, p. 4 – ‘The Gaiety Theatre’.
- 72 His musical abilities and preferences are clearly evident in the article: *Zeehan and Dundas Herald*, 10 October 1898, p. 3 – ‘The Gaiety Music Hall’.
- 73 An online search using the *Trove* facility identifies around 300 newspaper items that relate to Thomas Searell. A scan of the first few screen pages of item listings begins to build a picture of the man, but it is the overall impression from reading many articles that is important in constructing a reliable image of him. Some examples from those first few pages include: *The Mercury*, 3 May 1895, p. 3; *The Mercury*, 19 October 1893, p. 4; *The Mercury*, 25 March 1895, p. 4; *The Mercury*, 12 May 1894, p. 3; *The Mercury*, 13 October 1893, p. 3; and *Launceston Examiner*, 8 July 1893, p. 8, but it is not possible to build any kind of trustworthy picture from these alone.
- 74 The latter supposition is based on the content of the Midwood cartoon that illustrates an exchange between the two men. A copy is provided shortly after this point in the text.
- 75 The images for these cartoons were provided by the staff of the University of Tasmania Library Special and Rare Materials Collection. They were titled, respectively, ‘W. Baker – senior official in the Public Works department’ and ‘Two civil servants in the Public Works disliking each other intensely’. It can be demonstrated conclusively that the initial ‘W’ in the first instance is quite wrong and that the gentleman in question is indeed Orlando Baker. It is clear that the identities of individuals in Midwood’s cartoons of public service staff must have been suggested well after the event, probably after his death in 1912 (he died just before Baker), by people with imperfect recollections of the names of personnel in their former workplace. The cartoons can only have been drawn when Searell was working with Baker and Tom Midwood in the drafting section between June and January 1900, and it is therefore patently obvious that it must be Baker with Searell in the second cartoon. It is also obvious that it is the same Mr. Baker in the first cartoon. Importantly, checks in the Government salary journals (the TAHO AUD17 series) for the decade 1895–1905 reveal that there was no other Mr. Baker in the PWD over those years.
- 76 *The Mercury*, 26 June 1899, p. 2; *Launceston Examiner*, 15 December 1899, p. 6; and *Launceston Examiner*, 18 December 1899, p. 7. (The information presented was synthesised from a combination of these sources.)
- 77 *Launceston Examiner*, 18 December 1899, p. 7.
- 78 *The Mercury*, 30 December 1899, supplement p. 2; *The Mercury*, 2 January 1900, p. 3; and *The Mercury*, 8 May 1900, p. 2. Two of these letters show such an intimate knowledge of the Government’s design requirements for the building and of Searell’s submitted design that one is tempted to conclude that only Searell or someone carefully ‘worded up’ by him could have written them.
- 79 *The Mercury*, 9 May 1900, p. 2.
- 80 *The Mercury*, 7 July 1900, p. 5 (letter by Alan Walker).
- 81 *The Mercury*, 15 September 1900, p. 3. (The article reports that: ‘It is understood that the Departmental design was prepared by Mr. Orlando Baker, M.S.A. London, of the Works Department’.)
- 82 *ibid.*
- 83 TAHO: PWD266/4/4642 & PWD266/4/4643 – Tasmanian Museum and Art Gallery – Additions, Drawings (sets) 4488-4 and 4488-3.
- 84 Huxley, Joanne 2008, *Site: Tasmanian Museum and Art Gallery*, Tasmanian Museum and Art Gallery, Hobart, Tasmania, p. 57, and *The Mercury*, 18 June 2012, p. 5.
- 85 TAHO: PWD266/4/4642 & PWD266/4/4643 – *op. cit.*
- 86 *The Mercury*, 10 May 1902, p. 5.
- 87 This information and all subsequent details about job classifications and salaries were extracted from the original hand-written journals kept by TAHO under the series number AUD17/1, and titled *Registers of the payment of salaries and other allowances to officers of public authorities*. The specific journals used were in the range AUD17/1/23–AUD17/1/47, covering the years 1887–1912.
- 88 From Australia Post’s *Heritage property showcase* website page (<http://auspost.com.au/about-us/heritage-property-showcase.html#launcestonpo>), ‘Launceston Post Office’ (accessed 18 October 2012).
- 89 *Examiner* (Launceston), 14 February 1901, p. 5.
- 90 Australia Post’s *Heritage property showcase* website page – *op. cit.*
- 91 *The Mercury*, 4 October 1901, p. 4, and *The Mercury*, 26 October 1901, p. 4.
- 92 *The Mercury*, 14 June 1902, p. 3.
- 93 *The Mercury*, 11 August 1903, p. 5.

- 94 TAHO: PWD266/1/464 (Architectural plans etc. – attributed to ‘Architect, PWD’).
- 95 TAHO: AUD17/1/40 & AUD17/1/41 – op. cit.
- 96 *The Mercury*, 27 August 1901, p. 1 & p. 2 (two separate articles).
- 97 *The Mercury*, 6 May 1902, p. 1.
- 98 TAHO: RGD marriage registry entry 348/1903.
- 99 TAHO: RGD33 73/1869. (Emily was born on 7 July 1869.)
- 100 TAHO: RGD33 638/1890.
- 101 The 1903 Commonwealth Electoral roll lists some of her family in the electorate of Denison, living at 120 Warwick Street, with Ada Ellen, Alice and Emma (the mother) as ‘domestic duties’; Frederick as ‘stonemason’; and Joseph (the father) and Thomas as ‘labourer’.
- 102 *Examiner* (Launceston), 19 October 1906, p. 7; and PWD266/4/349 Plan – Public School East Launceston; Drawing No. 4676-1 Plan, Sections, Elevations.
- 103 *The Mercury*, 13 May 1907, p. 6; and *Examiner* (Launceston), 31 October 1907, p. 5.
- 104 *ibid.*
- 105 General law property deed Volume 11 Folio 6313 (title conveyance), finalised on 20 July 1907.
- 106 It would be preposterous to suggest otherwise: Orlando, as a highly competent but inadequately paid architect, would hardly have hired someone else to design his house.
- 107 General law property deed Volume 12 Folio 72 (mortgage agreement), finalised on 11 March 1909.
- 108 He surely would have made certain that his loan was paid out by the time he retired on 30 June 1911, as after that date his income would have been substantially reduced.
- 109 The name ‘Glennville’ as the name of the house was given in his funeral notice, in *The Mercury*, 7 November 1912, p. 1; the property valuation roll in the *Tasmanian Government Gazette*, 3 January 1911, p. 17 confirms that he was in residence when the assessments for that listing were made in late 1910.
- 110 The ‘Venetian’-style grouping of three windows: a regular-width one bracketed by two narrow ones; the air of ‘solid formality’ contrasts with the more delicate, rambling informality that characterised many of the grander Federation-era homes.
- 111 1911 property valuation roll – op. cit.
- 112 *The Mercury*, 27 November 1908, p. 3.
- 113 *The Mercury*, 27 May 1909, p. 5.
- 114 The information in this paragraph was synthesised from the following articles: *The Mercury*, 19 March 1909, p. 5 – ‘A New State School. the largest in the State – Modern and well-equipped structure’; *The Mercury*, 18 August 1909, p. 6 – ‘Trinity Hill School – The Proposed New Structure - Mr. Propsting interviewed’; and PWD266/4/1038 – Elizabeth Street State School, Elevations and Sections, Drawing No. 4797-3, Elevations, Sections (penultimate version of drawing); and the final, coloured version of this drawing (4797-3), along with the final, coloured versions of other related drawings (including 4797/7), held by Elizabeth College.
- 115 *The Mercury*, 3 July 1909, p. 12 – advertisement calling for tenders, dated 22 June; and *The Mercury*, 4 August 1909, p. 5 – ‘Elizabeth Street State School – Its construction delayed – New director to be consulted’.
- 116 *The North Western Advocate and the Emu Bay Times*, 16 April 1910, p. 4 – ‘A new State School’.
- 117 *The Mercury*, 2 November 1911, p. 3 – ‘Trinity Hill School – A “Visiting Day”’.
- 118 State government superannuation had been made available to public servants under the *Civil Service Act 1900*.
- 119 *The Mercury*, 1 July 1911, p. 5.
- 120 *The Mercury*, 7 November 1912, p. 1 – death notice.
- 121 TAHO: Will No. 8954, Baker, Orlando. The capital value information is from the 1911 property valuation roll (op. cit.).
- 122 Information about the third living child, a daughter, is from: Lennard, Brendan (1992), ‘Orlando Baker – Biographical Information’, Appendix B in *Customs House, Davey Street, Hobart: Conservation Plan*, Australian Construction Services. It is from this source also that the specific information that Orlando died of heart failure was derived.
- 123 General law property deed Volume 15 Folio 5045 (title conveyance), finalised on 3 October 1921. This details her conveyance of the property to Charles N. Atkins.
- 124 General law property deeds, Volume 13 Folioms 2901 and 4228, finalised on 16 April and 3 September 1914, respectively.
- 125 No evidence has been found of her presence, in any of the Tasmanian records searched, over the years 1890 to 1929. These records included newspapers, death and marriage records, electoral rolls, post office directories and Walch’s Almanacs.
- 126 Details relating to her death were sourced from: her death notice – *The Mercury*, 26 November 1943, p. 8; her funeral notice – *The Mercury*, 27 November 1943, p. 6; and her will – TAHO – AD960/1/69 Will No. 26370, Emily Baker.
- 127 *Tasmania Post Office Directory* (H. Wise & Co., Hobart) for the years 1903–07 inclusive list her at No. 249, although strangely the property valuation rolls in the *Hobart Gazette*, for 21 November 1904 (p. 1812) and 18 December 1905 (p. 2053) – the years 1906 & 1907 were not checked – do not recognise the existence of

- 249 Bathurst Street as a valid address. Instead, they list Clara's residence as 255A Bathurst Street, between 255 and 247. These listings confirm that Clara was the tenant and the landlady was Catherine Chisholm.
- 128 *Commonwealth Electoral Roll* for 1905, Electorate of Denison, Division of Hobart West: Orlando Baker jr. living at 249 Bathurst Street, occupation = clerk; he does not appear to be listed in Denison in the 1903 roll.
- 129 *Tasmania Post Office Directory* (H. Wise & Co., Hobart) for 1908 – in this first year in Paternoster Row, her address was given as no. 7; in subsequent years it was no. 9, but it is not clear whether she moved next door or the address was changed.
- 130 *Tasmania Post Office Directory* (H. Wise & Co., Hobart) for the years 1909–31 inclusive list Clara at this address; confirmation is provided by the property valuation roll in the *Tasmanian Government Gazette* for 22 May 1911, p. 1856, which gives her as the occupier of the property and the owners as the Trustees of the Primitive Methodist Church. Her death details are from *The Mercury*, 11 April 1931, p. 1. Her death notice in *The Mercury* refers to her as 'a patient sufferer gone to rest', indicating that she had had an extended illness.
- 131 *Tasmania Post Office Directory* (H. Wise & Co., Hobart) for the years 1932–42 inclusive list him at this address; his death details are from *The Mercury*, 1 May 1942, p. 4.
- 132 TAHO: RGD marriage registry entry RGD 409/1921.
- 133 On the seven known occasions where his role was specifically mentioned in newspaper items, he was three times referred to as 'the Government Architect' (*The Mercury*: 4 October 1901, p. 4; 26 October 1901, p. 4; and 14 June 1902, p. 3) and four times as 'architect' of/in/etc. the Public Works Department (*Tasmanian Mail*, 24 March 1900, p. 17; *Examiner* (Launceston), 14 February 1901, p. 5; *The Mercury*, 10 May 1902, p. 5; and *The Mercury*, 1 July 1911, p. 5).
- 134 This might have been the case, for instance, with the following item: *Examiner* (Launceston), 20 January 1900, p. 9 – 'North Launceston State-school', which states that 'The plans were prepared by Mr. Shield and the officers of the Public Works Department'.

TASMANIAN MUSEUM ROCK WALL: A DIFFICULT BIRTH!

Ralph Bottrill and Garry Davidson

Bottrill, R.S. and Davidson, G.R., 2013. Tasmanian Museum rock wall: a difficult birth! *Kanunmah* 6: 59–67. ISSN 1832-536X. In a joint venture with Mineral Resources Tasmania and the University of Tasmania, the TMAG has constructed a “rock wall”, a panel of cut and polished slices of Tasmanian rocks, designed to illustrate the geological formation of Tasmania as well as forming an attractive artwork. Its construction suffered from a lack of time and resources, but came through in the end thanks to some hard work and dedication by several people.

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KEY WORDS: Tasmania, geology, stratigraphy

Introduction

The “rock wall”, a mosaic-style panel of cut and polished slices of Tasmanian rocks, is a new feature in the new TMAG science gallery. It was designed to illustrate the geological formation of Tasmania, as a very simplified cross-section from west to east across the island (Fig. 1). It uses pieces of real rocks from the main geological formations in the State to illustrate how these formations fit into the State’s geological structure. A lot of artistic license was required to simplify the geological structures, including complex folds and

faults and multiple generations of igneous intrusions. Some artistry was also needed by the creators to form what many feel could also be considered an attractive artwork!

To understand the beginnings of the Rock wall recently installed in the TMAG (Tasmanian Museum and Art Gallery) requires a little background.

Changing times in museums

Most museums worldwide are in some difficulty, with declining funding, staff and visitors. In our youth they were a place to



Fig. 1. The rock wall.



Fig. 2. The rock wall (detail).

visit regularly (for some us at least) to spend time seeing cases with large, systematic, unchanging collections and learn from them how the world works (pre-Internet); nowadays the displays are relatively minimalistic with relatively small, “arty”, thematic, short term displays, with more interpretation and hands-on exhibits, but less diversity. Also in most museums the natural sciences are distinctly subordinate to anthropology and history, and Earth sciences are usually greatly dominated by the biological sciences. Museums in smaller regional centres suffer particularly from the lack of staff and funds to mount significant displays, despite often being custodians of wonderful local material. The geological curator of TMAG retired in 2005 and was not replaced, although two part-time Honorary Associate positions were offered to help keep an eye on the almost priceless geological collections, dating back to the late 1800s: Don Squires (fossils) and Ralph Bottrill (minerals).

In 2008 the Tasmanian government promised funding to redevelop the museum, something greeted enthusiastically, though there was some sadness to see so many great specimens buried back in the compactuses. Discussions about the new displays started in 2011 and mostly revolved around finding 100 iconic objects representing Tasmania, some Wunderkammer style (i.e. non-thematic) window displays of random items from the collections, and some initially vague themes of Tasmanian history and nature. Planning seemed mostly controlled by design and financial constraints rather than scientific ideas. However, the scientific staff did persist with getting some scientific input, particularly at the urging of MRT scientist David Green. They agreed there was the need for some geological input to accompany the biological material, and a few odd minerals and fossils, particularly to accompany Gondwanan concepts. To this end we sought ideas far and wide and



Fig. 3. Looking for some big rocks – where are they all?



Fig. 4. That's about a load!

got some good input especially from the University of Tasmania and the Geological Survey (MRT), the management of which kindly supported some of their staff members joining a committee for coordinating display ideas. This was a really interesting committee actually, made up of biologists, geologists, designers, managers, and facilitators. One of our first acts was to argue strongly that the main science gallery should include geology, and so the name 'Earth & Life Gallery' was born.

The conception (Who's baby?)

The committee really began in earnest in April 2012, and some great ideas were considered, including plate tectonic models, interactive geological displays, a recreated mine adit, a black smoker model, a timeline walk or drive leading to the museum, and a mural of polished stones. Many of these sadly were too expensive, difficult or large, but the mural theme

struck a chord and bounced between things like a mosaic map of Tasmania, a drystone wall, a timeline, a stone floor, etc., till Garry Davidson came up with the idea of a geological cross section made of the actual Tasmanian rocks, covering a wall. This was generally thought to be an exciting concept, although there was some feeling that it was too expensive and would take too long. There was also some pertinent concern as to whether the wall and floor could hold this object. There were also some peculiar concerns from the design people about having "dirty rocks" in a museum, making crumbly messes on the floor and damaging children's heads! Luckily the Museum Director, Bill Bleathman, jumped at the concept and promised the money if we could prove the practicality, and have it done by the opening in mid-February 2013.

Garry scurried off with the idea of putting together a small square of different polished slabs mounted on a board, which

A SLICE OF TASMANIA

Tasmania has had a long, turbulent geological history of at least 1300 million years, of mountain building and volcanism spanning ice ages and tropical climates. This stylised west to east cross-section through Tasmania's portion of the earth's crust, constructed from local rocks, represents important events in the state's geological history.

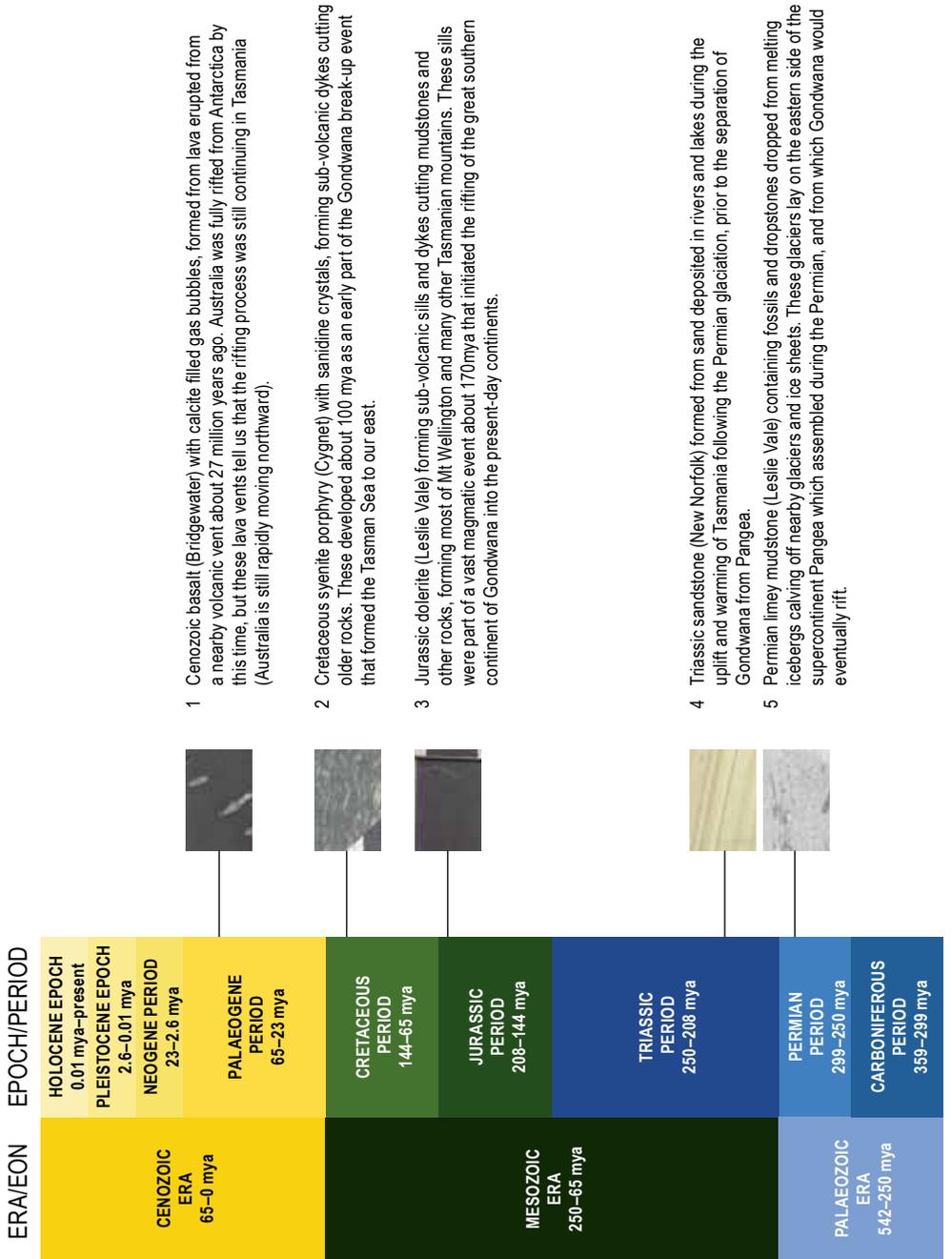




Fig. 5. Geological Index to the wall

DESIGNED BY RALPH BOTTRILL, DR GARRY DAVIDSON AND BRAD RIZZOLLO. WITH THANKS TO UNIVERSITY OF TASMANIA, MINERAL RESOURCES TASMANIA, HERITAGE STONE P/L, BORAL QUARRIES, HBMI, NORRSKE SKOG, MIKE & ELEANOR PHELAN, RICHARD WOJTEK AND DEHNE MCCLAUGHIN



Fig. 6. Getting a little assistance with a big one!



Fig. 7. Making our selection.

he constructed at the University. This took a few months to create. There was a lot of argument about whether it should be polished or a rough faced wall; eventually the polished model won. Calculations on the weight (about 9 kg/panel) indicated that the wall had to be scaled down to about 1.6 m square, with 16 panels (40 x 40 cm) mounted in a metal frame mounted on a wall. A design was drafted and after some to-ing and fro-ing we came up with an arrangement that appeared aesthetically pleasing as well as relatively geologically accurate (OK at least vaguely – trying to recreate recognisable folds, faults and unconformities in rocks was not simple with our small budget!). It showed a good representation of Tasmanian stratigraphy, fairly flat-lying at the top, and quite deformed at the base, with various intrusions and some mineralisation. The Precambrian and Cambrian rocks are dealt with fairly simply unfortunately, to save it

looking totally chaotic. A quote from Brad Rizzollo, stonemason of Heritage Stone for the cutting and polishing was accepted in about October 2012; something he may have regretted at times later during the construction!

The TMAG design people hoped we could simply buy all the stone off the shelf from Heritage Stone or other stone masons, but we explained that their stock was mostly of imported materials and we wanted realism, but the rocks we wanted were mostly going to take some considerable time visiting quarries or the bush around Tasmania to find. Rock trips, yeah! Luckily our workplaces were very supportive. Heritage Stone had some nice Coles Bay granite and local sandstone for starters though, while Garry raided the University collections, and Ralph those of MRT, for suitable rocks, and we did find some great ones there too! We needed rather large samples though – at least



Fig. 8. Oops!



Fig. 9. Polishing the slabs.

0.5–1m – to enable getting suitable sized slabs to show satisfactory continuity in the final panels. We would have liked larger ones in some cases, but they generally sufficed.

Rock trips

Our first road trip was in November 2012 to the HBMI Quarry at Leslie Vale, where we found some big blocks of dolerite, one of the principal rocks constituting the state, and some beautiful hornfelsed fossiliferous mudstones with glacial dropstones. The quarry management, especially John Sherburd, were incredibly helpful with extracting and loading the samples, nearly a tonne in size: Fig. 1). The ute was pretty tail heavy on the windy road back to the depot, we made it though!

The next trip was to the Boral Bridge-water Quarry, where again the manager, Mike Pilcher, was very helpful, and helped us obtain and load some great

Tertiary basalt with agate-like calcite filled amygdules.

In December 2012 Garry and I fitted in a geology conference in Strahan with more collecting, taking two vehicles, and with help from Dehne McLaughlin, and locals Mike and Eleanor Phelan (who donated some great stichtite in serpentine), and Richard Wolfe, we got a couple good carloads of useful rocks: Ordovician Conglomerate, Cambrian volcanics, serpentinite and ore samples. We had thought about a truck and crane but were concerned about the cost and logistics. OK, really we just figured we were Aussie blokes and just buy us a beer and point us at a job and we can do anything! It's amazing what you can lift with a straight back, tightening those core muscles. We had some long days but luckily people waited with a forklift to help us unload back in Hobart (and wondered how we managed to load it all!).



Fig. 10. Cutting to shape.



Fig. 11. The hanging.

We were told the opening would be delayed a month, to mid-March 2013, giving us some breathing space. After a Christmas break and some leave, the deadline for completion of the display meant that time became very critical to complete the display. Heritage Stone did not want to start the cutting and polishing until it was all together, and the deadline for completion was for mid-February 2013. So we took several more field trips around the State, including Bicheno, Rossarden, Maydena and other areas, mostly on our weekends. Some trips were to quarries, others looking in roadside cuttings and coastal outcrops. We mostly found loose material; no geological heritage sites were damaged!

The birth of the wall

Finally we appeared to have enough rock (several tonnes) to commence construction, and with fingers crossed we left them to Brad to cut into 15mm slabs

for starters. Structural problems were found with many, it broke our hearts to see some wonderful rocks disintegrate under the saw, despite Brad's best efforts. We had to take an extra trip for some spare material, however Brad's skill with rock showed through and in the end we got it all slabbed and polished satisfactorily (the sandstone was left unpolished). The slabs were then trimmed to shape, quite a tricky manual job, then we fitted these pieces as a mosaic to match the plan. There were a few hiccups with some pieces initially going in in the wrong orientation geologically, with some recutting needed, but eventually it all fitted together very well (and we refuse to listen to any geologists tell us of any geological inconsistencies – they can go make their own!).

Brad had to spend a couple late nights finishing it off but eventually he got it all arranged and glued together, fitted in the metal frame, and delivered to the Museum on deadline day, amazingly! Hanging it on

the wall in the old Hunter Gallery was a challenge too, as the wall was not quite flat. Fault lines were another challenge, we had considered leaving gaps or thin black strips of rock but eventually settled on some copper strips, which worked satisfactorily, and these were added after hanging. I think we all breathed a big sigh of relief and had a quiet drink or two after it was finally hung!

The official opening was a week later, as workmen, scaffolds, etc were bundled out, and things finished off as well as possible. The wall got some good comments from visitors although some people thought it merely a decorative mosaic until we finished writing up an information panel and index a couple weeks later. It has been described as a rock quilt by some, not a bad analogy! But we do hope the panel also helps in teaching visitors about the structure of the Earth, and how Tasmania was formed.

Where to from here?

Some more integration with concepts of Gondwana and plate tectonics, as well as life sciences, would be useful at some stage. Better displays are desperately needed, with themes and interpretation, showing how geology and minerals

affect our landscapes, land uses, homes and technology, ultimately affecting all parts of our lives. Architecture and design is all very good but many people still come to museums to learn and see interesting and beautiful objects from our natural world.

One thing we need to get better at is realising that the Earth is part of our natural heritage, and whilst mining is very vital to our economy, modern technologies and way of life, very little from the mines finds its way to museums nowadays. Most of the good minerals and geological specimens in the TMAG were found over a hundred years ago, most modern mines open and close, producing millions of tons of ore but rarely a specimen preserved for posterity. Spectacular specimens worth thousands of dollars are crushed for a few cents worth of ore; preservation of any specimens is usually considered robbery from the mine, rather than the national heritage it should be. Hopefully we can work together better in future.

The National rock garden in Canberra is working on a similar theme, collecting iconic rocks from around Australia to use to educate people into how the land we live on was formed and utilized, and how it affects us all.

Acknowledgements

We would like to say a big thank you to everyone who assisted in this endeavour, particularly many of the staff of the museum, most especially Ruth and Cathy,

Nicky who drove us hard but really made it happen, plus many staff at MRT and the University, Norske Skog, and our long suffering families!

WELCOME TO TASMANIA. ILLUMINATING THE 1868 ROYAL VISIT TRANSPARENCY

Elspeth Wishart

Wishart, E, 2013. Welcome to Tasmania. Illuminating the 1868 Royal Visit transparency. *Kanunnah 6*: 68–81. ISSN 1832-536X. In 1868 the Duke of Edinburgh toured Tasmania amidst great celebrations. A surviving relic from these public demonstrations has been rediscovered, conserved and is now exhibited in the recently reopened Tasmanian Museum and Art Gallery. This paper traces the documentation, research and our discovery of the part this transparency played in the Royal Visit and our realisation of the significance it now holds.

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KEY WORDS: Transparency, Illumination, Duke of Edinburgh, Prince Alfred, Frank Dunnett, Tasmania, Hobart, Royal Visit

Introduction

A large painting of His Royal Highness Prince Alfred, Duke of Edinburgh, stands proudly in an exhibition in the Bond Store of the Tasmanian Museum and Art Gallery; a relic of the strong demonstration of loyalty to the British Crown in 1868.

The painting came to the Museum from the Lands Department during the year of the Australian bicentennial celebrations in 1988. Once registered it was placed into storage and apart from a brief examination by a visiting researcher it remained there until in 2006 when the Tasmanian Museum and Art Gallery received funding

to embark on a major redevelopment. This created the opportunity to develop new exhibitions and to search the collections for objects that could highlight the themes proposed for the exhibitions.

A theme of the *Changing Landscapes: Creating Tasmania* exhibition, which is located on the first floor of the Bond Store, focuses on identity. It examines changing Tasmanian identity in the nineteenth century and how it was projected to the world. Did Tasmanians still consider themselves British and/or imperialists, Tasmanian or even Australian? Did they identify with the British monarchy, with

the convict origins of their colony or were they seeking something else? As they sought a new identity the colony visibly grew not only in population, extent of land ownership, and economic growth, but they appeared less reliant on the Mother Country. The colonists of Van Diemen's Land and later Tasmania embraced the nineteenth-century phenomenon of international exhibitions by sending examples of products and resources across the world and to other colonies to promote their own strengths and identity. As a British colony they were particularly anxious to impress those in Britain. Tasmania had the largest representation of all the Australian colonies at the Great Exhibition of the Works of Industry of all Nations at the Crystal Palace in London in 1851.¹

When it was known that the Duke would visit Tasmania as part of his Australian tour this was seen as a further opportunity to promote the colony itself through him to Queen Victoria and thereby the 'Mother Country'. A narrative compiled soon after the Duke's visit by a Victorian writer J.G. Knight shows that Tasmanians enthusiastically welcomed him:

From the detailed accounts which have been published, as well as from other authentic sources of information, it is well known that the people of Tasmania welcomed his Royal Highness with the greatest fervour and enthusiasm. It was not to be imagined that his reception would be otherwise, as the Tasmanian community has always shown the highest public spirit on all occasions of importance. At the Great Exhibition in London in 1851 and 1862, and recently at the Inter-colonial Exhibition at Melbourne of 1866-7, Tasmania displayed more

taste, skill, and liberality than any other colonial contributor, and it was therefore but natural that she should accord to a son of Queen Victoria a brilliant and generous reception.²

Amidst this context and the search for key objects from the collection, the relic from the 1868 Royal Visit needed to be re-examined. Little was known about it except that there was a connection with the Royal Visit of the Duke of Edinburgh in 1868 and that it had been transferred from the Lands Department in 1988. Questions were raised, as to why the Lands Department had it, what was it and who painted it?

It was necessary to unroll and examine this large painted 'banner'. It needed to be assessed in several ways. Firstly, was the subject appropriate for the context of the exhibition? Secondly, was the physical fabric able to provide clues of the object's past? Thirdly, was the object robust enough from a conservation point of view to handle display conditions? To consider these questions it is important to first describe the object.

The transparency

The large painted 'banner' measures two and a half metres by just less than two metres. The subject is a three-quarter length portrait of the Duke of Edinburgh in his naval uniform wearing the decorations of the blue sash and two stars.³ The painting (Fig. 1) is somewhat naïve or crude in its execution with almost a sense of being unfinished but bears a similarity to other contemporary images. A photographic print of the Duke held by the State Library of Victoria (Fig. 2) confirmed that the image of the naval officer



Fig. 1. The transparency of HRH Prince Alfred, Duke of Edinburgh, after conservation work.

PHOTOGRAPHER ERICA BURGESS TMAG

was HRH Prince Alfred.⁴ The painting shows him leaning on a capstan, with an anchor, barely visible behind the four Union Jacks and acorns amongst oak leaves. The image is framed by stylised branches and a ribbon which wraps across the bottom inscribed with “WELCOME TO TASMANIA”.

The physical construction consists of two thin plain weave fabric pieces which are hand stitched together. The conservation assessment revealed that at some time it had been tacked (stretched) onto the back of a supporting frame. There was no evidence that it had been framed or of any other supporting structure on the face side of the banner. The subject is painted with thin paint and there is

evidence that paint was also applied to the reverse side. The thinness of the fabric and of the paint suggested that it may have been prepared as a backdrop for a stage or as a prop for a public event. The lack of surface coating further suggests it was an ephemeral object made for a one off use, a certain amateurish feel and, the fact that it had paint on both sides was also somewhat puzzling.⁵ There was also no evidence of a signature which perhaps implies that its maker did not intend it to last.

The Senior Curator of Decorative Arts at the Tasmanian Museum and Art Gallery, Peter Hughes, suggested that given its lightness and the evidence of paint on both sides, it may have been a transparency, which was lit from behind and viewed from the front. Transparencies had been used in illuminations world-wide. Could this perhaps have been part of the Grand Illumination for the Duke’s visit held in Hobart Town? It was clear that more research was required to establish what the Royal Visit had entailed and how this item could have contributed to it.

The 1868 Royal Visit

The visit by HRH Prince Alfred, Duke of Edinburgh the second son of Queen Victoria was the first Royal Visit to Tasmania. As discussed above, Tasmanians at this time were questioning their identity. In the preceding fifteen years, convict transportation had ceased in 1853, Van Diemen’s Land had been renamed Tasmania and self-government had been proclaimed. Following the loss of labour and migrants to the colony in the form of transported convicts and the rush to the Victorian goldfields, the visit was seen as an opportunity to promote the



Fig. 2. HRH Prince Alfred, Duke of Edinburgh.

STATE LIBRARY OF VICTORIA, IMAGE No a15044 PHOTOGRAPHIC PRINT:
ALBUMEN SILVER CARTE DE VISITE, ON CARTE DE VISITE

colony to Britain for potential migration. Cindy McCreery, an historian who has researched Prince Alfred's voyages in the *Galatea* noted that:

the visit provided Tasmanians with an unparalleled opportunity to promote investment in and immigration to their colony. Locals placed great hopes in the power of the press to spread the good word about their island home.⁶

The anticipation of the Duke's visit built as the time grew closer and by November 1867 the *Mercury* reported that:

THE one great and all absorbing topic here now is PRINCE ALFRED'S proposed visit. Nothing else is talked of, thought of, or even dreamed about. It is PRINCE ALFRED here, PRINCE ALFRED there, PRINCE ALFRED everywhere. Morning, noon, and night, it is PRINCE ALFRED with everybody. Everything that could do so with any propriety bears PRINCE ALFRED'S name. How it will be when His ROYAL HIGHNESS is really with us, we can form no conception.⁷

Finally in November 1867 the public were given an idea of the itinerary:

He is to land at the new wharf the day after his arrival, and triumphal arches have been erected on his way from that to government house. The public buildings are to be decorated, and the various public bodies in the city, together with the citizens at large, are to be invited to take part in the procession. As His ROYAL HIGHNESS passes through the domain to government house, all the Sunday-school children within reach, to the number of about five thousand, will be assembled under the supervision and control of their respective

teachers, and will sing an ode of welcome. On the night of his arrival, there will be a grand display of fireworks and bonfires, with a torchlight aquatic serenade. An illumination of the public buildings and of the city generally, will take place on a night thereafter to be named.⁸

The Duke commenced his global tour aboard HMS *Galatea* in January 1867 from Britain. He travelled via ports of Madeira, Rio de Janeiro and Cape Town and then onto Australia, visiting South Australia and Victoria before arriving in Tasmania a year later, on January 6th 1868. His visit to Tasmania lasted 12 days during which he traversed the length of the island, visiting Launceston and attending numerous functions.

His visit to the Australian colonies was embraced by loyal enthusiasm wherever he went:

It would be impossible to adduce stronger evidence of the genuine loyalty of the Australian community to our gracious Queen and the members of her family, than is afforded by the fact that not only where His Royal Highness was enabled to visit, but throughout the whole of Victoria (and the remark applies, it is believed, with equal truth to the adjoining colonies), every little township, even where there were not more than a score or two of inhabitants, set apart a day or two for the special manifestation of its loyalty ; and it may with pride be affirmed that there is scarcely a child in the colonies that cannot sing "God save the Queen".⁹

The visit was recognised by many events in Hobart Town organised both officially by the appointed Reception

Commissioners and also by 'a citizens' committee which,

was appointed to manage the erection of an emblematic arch near the landing place, a citizens' ball and a dinner to the crew of the Galatea. All other matters were left to the official Reception Committee and to private effort ... The public have already subscribed liberally towards the three objects named above and the emblematic arch is now in course of erection¹⁰

The Duke's travels fortunately left a wake of newspaper accounts providing incredible detailed narratives of many of the events that he attended, witnessed or participated in. Many events and the associated descriptions have a similarity even across the globe with official welcomes, balls, welcoming arches, countless dinners and illuminations.

On the day of his arrival in Hobart Town he was received with genuine enthusiasm.

Suffice it to say, that from the moment of his Royal Highness's landing until his arrival at Government House, the welcome which greeted him was spontaneous, heartfelt, and sincere. By nine o'clock in the morning the streets were crowded with people who had turned out to view the general decorations, and to make sure of their positions for obtaining a good sight of the procession. From the river and wharves, wherever a clear view of the town could be obtained, the sight was most imposing, and seen from the top of the hill behind Franklin Square, the marshalling of the procession was a most magnificent sight. The dense mass of heads moving about in the plateau below, the waving of the flags and banners borne by the friendly societies, the red shirts of the firemen, and the emblematic arch with

its two whaleboats manned by crews of native youths in red shirts and sailor hats, and beyond all the long clear space, with the dais for the accommodation of the Mayor and Corporation standing out in gold relief, dotted here and there by groups of officials in uniform, and the clergy in their robes of office, besides little knots of private citizens; the whole scene enlivened by the regular lines of scarlet coats, white belts, and glittering bayonets, distinguishing the guard of honour, combined to form a scene of great brilliancy.¹¹

There was great excitement for the Grand Illumination, the *Mercury* reported the growing anticipation in November and December 1867: 'The illumination is likely to be a very grand affair ...'¹² It was scheduled for the evening of Friday January 10th after the Duke's visit to New Norfolk and the Salmon Ponds.

On his return from the Salmon Ponds in the evening, Hobart Town will be illuminated. For this, preparations have been made on a scale never before attempted, and it can hardly fail at success, if the weather holds up, of which there is every prospect. A little less of moonlight would probably have allowed of the various transparencies and other devices being shown to greater advantage, but gaslight, when in full force, as it will be on this occasion, is far more powerful than moonlight.¹³

The weather however was not kind with 'heavy rain falling'¹⁴ and both the trip to the Salmon Ponds and the illumination were called off although it was hoped to have the latter on the following evening.

After two postponements, however, the Grand Illumination finally took place

on the 17th January, the eve of the Duke's departure from the colony. *The Mercury* reported that the:

display, though not such a success as could have been wished on the one hand, was on the other by no means a failure. The weather neither perfectly propitious, nor positively unfavourable, but it was at all events a great improvement upon any we have been fortunate enough to enjoy since the day succeeding that of the Royal Duke's landing.¹⁵

It is with particular relevance to the image and the newspaper's account on 18 January 1868 that is critical in determining the story behind our relic as it highlights its place in the illumination.

The illuminations were spread over a considerable area of Hobart. *The Mercury* gives vivid accounts of the many street decorations street by street, commencing in Macquarie St with the Public Offices but encompassing an area ranging from Sandy Bay to the Wharfs, up to Burnett Street and across to Antill and Goulburn Streets.

The main forms of illuminations consisted of crowns, stars and letters created by gas lighting as well as candles, transparencies, Chinese lanterns, and bonfires on the surrounding hills. Maritime themes were strongly represented in Hobart Town particularly connecting Hobart as a maritime town with the naval background of the Duke.

The *Mercury* listed all the properties that participated in the illumination. These numbered some 416 which had either transparencies or illuminations or a combination of both. They ranged from the Public Offices to commercial

businesses as well as private houses. Those receiving special mention were the Government Offices with displays on the Macquarie and Murray Streets fronts as well as Franklin Square, the Electric Telegraph office, the Survey Office and the Town Hall. Each of these displays was vividly described.

Two hundred and forty properties had some type of transparency. The others had gas illuminations or displayed candles in the windows. Transparencies seemed to vary in size, quality and material. Some were large painted images, probably on fabric to be placed in windows and backlit with gas lighting such as the one held by the Tasmanian Museum and Art Gallery, others were described as paper transparencies with some of the smaller ones placed in window panes, these tend to be similar themes to those images illuminated by gas jets such as crowns, stars and anchors. The subject matter followed a theme and when compared to other illuminations across the world held for the Duke's visit they bear similar descriptions. Overall, a minimum of some 400 transparencies were spread between the 240 properties. (Fig. 3)

The Union Bank presented an example of the effect produced by combining transparencies and gas illuminations with the resultant effect of colour and light experienced by the crowds across Hobart Town during the evening:

The Union Bank was one of the most profusely and effectively adorned establishments of the entire city. In the centre of the Macquarie-street front was a creditably executed transparency of Prince Alfred and beneath it the name "Alfred" perforated in gas, on a red and blue ground,



Fig. 3. Illumination of the Town Hall Hobart Town.

STATE LIBRARY OF VICTORIA; CALVERT, SAMUEL (1828–1913) ENGRAVER

VISIT OF H.R.H. THE DUKE OF EDINBURGH TO TASMANIA – ACCN No IMP31/01/68/12 IMAGE No b49428

and above the picture was a perforated gas crown, on a ground of red and blue also.¹⁶

Further displays of the Illumination were highlighted in the newspaper accounts. Amongst these:

The Survey Office exhibited three large transparencies. That on the right wing was a portrait 8 feet by 6 of Prince Alfred in naval uniform leaning on a ship's capstan. At the base a ribbon was gracefully entwined and on it was inscribed the motto "Welcome to Tasmania". The entire was encircled in a wreath of laurel. On the left wing was a full length portrait of Her Majesty the Queen in Royal robes, surrounded with a wreath of laurel. This picture was of

the same dimensions as that previously described. In the centre of the building was placed a transparency 8 feet by 12, the subject being Tasmania welcoming HRH Prince Alfred. Her Majesty was represented standing in the centre of the picture on a raised dais in the act of introducing the Prince to a female figure symbolical of Tasmania, and Tasmania as receiving with extended hand the Royal guest, who in his turn was greeting her with a like display of courtesy ...¹⁷

The description of the first transparency clearly has similarity with our painting and makes sense of the construction of the object. In addition, the Survey Office was in the Survey Department, which later became

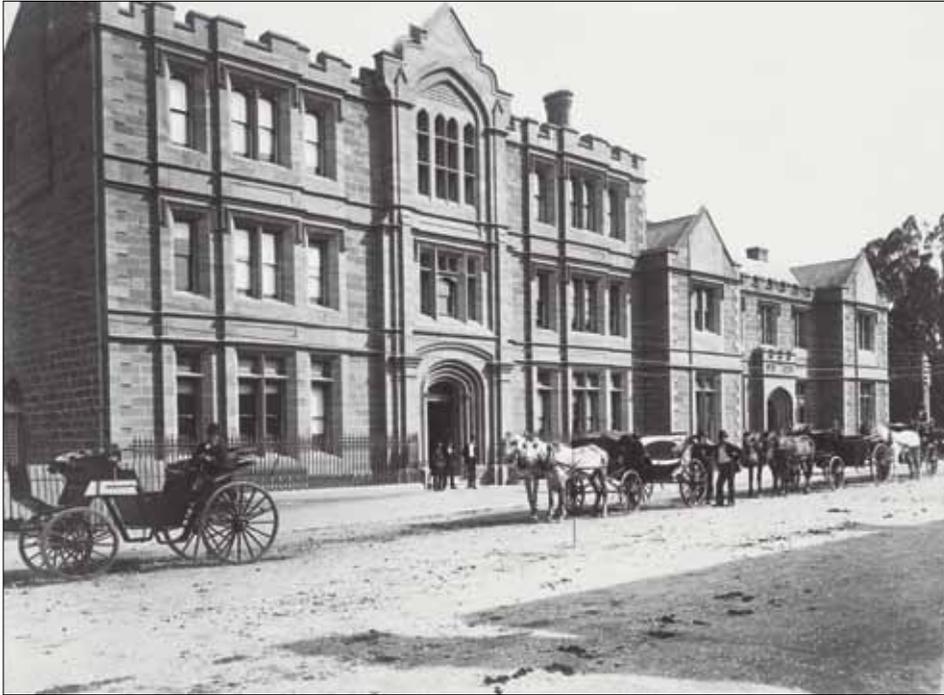


Fig. 4. St Mary's Hospital, on far right, later Lands Department.

LINC HOBART PH30-1-5605

the Lands and Survey Department and then Lands Department. This explains how the Department had the item in the first place.

The Survey Department at that time was located in the old St Mary's Hospital. (Fig. 4). St Mary's had opened as a subscription hospital in Campbell Street in 1841 but by 1849 had relocated to a new building in Davey Street where it continued until it closed in 1862. The Survey Office was relocated from Macquarie Street during the time that James Calder held the position of Surveyor-General, to the old St Mary's hospital in 1863¹⁸ and remained there until 1977.

Transparencies

The tradition of placing a candle in the window symbolised the warmth and security of the family hearth. It dates back centuries to the importance of the campfire, the safety it offered. The tradition is translated across cultures and could represent a family's loyalty to a travelling member. In Colonial America it was also used to honour dignitaries, announce births and celebrate. With the availability of gas lighting the illuminations continued the celebratory tradition on a larger scale and the transparencies added yet more depth to this.

Throughout the nineteenth century people had decorated their windows with transparent window shades on a type of Holland blind that presented a decorative edge on the interior of the room often of a landscape image that was highlighted during the day with the light shining through into the room but in the evening it worked the other way with gas lighting and candles throwing the image back out to the street.¹⁹ Transparencies for the illuminations were obviously meant to be viewed from one side especially those with words or letters on them but were possibly inspired by these types of room decorations.

The artists

Few of the artists that created the transparencies in Hobart Town are named; they remain anonymous except for four who are attributed to specific transparencies. Frank Dunnnett (1822–91), Nicholas Chevalier (1828–1902), Mr G.B. Anderson (unknown) and Master Frederick Hinsby (1850–1913).

Frank Dunnnett of the Survey Department is noted in the *Mercury*²⁰ as being responsible for painting the transparencies on the top floor windows of the Survey Office. That includes the transparency which now resides in the Museum collection. Born in Scotland in 1822 and trained as a lithographer, he migrated to Tasmania in 1856 and took up employment at the Hobart Town Survey Office where he applied his artistic skills as a draughtsman. One of his co-workers and a close friend was W.C. Piguenit who he instructed in painting.²¹

Two years before the Duke's visit, Dunnnett was awarded a highly com-

mended certificate for his sketches that were displayed in the Tasmanian Court at the 1866 Melbourne Intercolonial Exhibition. This possibly singled him out to be asked to paint the transparencies or perhaps he offered to paint them for the Survey Office. We can only speculate as to how this came about.

The *Mercury* also makes special mention of Mr M. Chevalier 'the well-known artist from Melbourne'²² who is attributed with painting the transparency in the central section of the Macquarie Street front of the Government Offices. This was also exhibited in Launceston for the northern illuminations. It represented 'two man-of-war sailors standing on the deck of an armed ship and supporting a medallion portrait of His Royal Highness, the Duke of Edinburgh. Beneath the portrait appears the capstan of the vessel enveloped in a wreath of flowers and at the foot of all is the motto "Long Live Prince Alfred"'. This transparency was flanked by the letters A.E. the letters being about four feet in height and formed of lamps with large yellow globes.²³

The attribution actually relates to Nicholas Chevalier whose transparencies in the Melbourne illuminations for the Royal Visit had been particularly noticed by his Royal Highness and he was asked to accompany the Duke's party to Tasmania and the following year when the *Galatea* returned briefly to Melbourne he re-joined the party sailing to England.²⁴

Mr G.B. Anderson of Collins Street also undertook transparencies for the Government Offices, at least three on the Murray Street front and these 'were decidedly the most artistic productions shown during the illuminations in Hobart

Town, with the exception of the large picture by Mr Chevalier ... and some others executed by Mr Anderson.’²⁵

The chemist shop Hinsby and Calvert in Elizabeth Street also had transparencies which are reported as having been executed by Master F. Hinsby. Frederick Hinsby, the son of pharmacist Henry Hinsby, painted the transparency for his father’s business; he had turned eighteen just days before the royal visit. The family history of Henry Hinsby mentions that during 1867 with the preparations for the royal visit ‘excitement reigned supreme’ in the Hinsby household.²⁶ There is no mention that this may have extended to the painting of the transparency. The subject was Neptune accompanied by the Prince with seahorses and nymphs, and the lighthouse at the entrance to the river. It included the Royal Arms and was surrounded with variously coloured reflectors with gas illuminations. The whole length of the shop front displayed coloured gas lights.²⁷ Frederick later moved to Melbourne, but he never married and on his death was listed as a green keeper, there are no further references that he continued his artistic pursuits.²⁸

Gas illuminations

Despite gas lighting being introduced to Hobart in the 1850s there were obviously problems with the supply of the gas at the time of the first Royal Visit. This meant that some of the illuminations ‘could not be got to burn’²⁹ The Town Hall and the Murray Street arch seemed to have more success with their illumination; either because they

were more sheltered or that the gas supply was a different source. They were supplied by gas directly from the larger pipe which traversed the wharf rather than the ordinary city mains.

It is needless to remark upon the inconvenience and annoyance entailed upon persons who had incurred considerable expense in preparations by a deficiency of the first essential to a successful carrying out of the designs.³⁰

Despite the failures of the perforated gas devices of which many of the elaborate designs were based, the disappointment was not reflected in the reaction of the crowds.

Of last night’s proceedings generally little need be said. The aspect of the city, thronged as it was by thousands upon thousands of eager pleasure seekers, all hurrying excitedly to and fro was something to be long remembered by all but those of long and frequent experiences of such scenes.³¹

Despite the detail of the newspaper accounts, there is no mention of whether the Duke witnessed the Grand Illumination or whether it was only experienced and enjoyed by Hobart Town’s citizens. It is recorded that he attended the Colonists Ball on that same evening but whether he bore witness to Hobart Town in this illuminated form is omitted.

The ball ‘proved one of the most successful that has ever taken place in Tasmania, although at one time apprehensions were entertained that the unsettled state of the weather, and the unfortunate necessity of holding the general illumination of the city upon

the same evening, would have debarred many of those present from actually joining in it.’³²

Conservation

The physical analysis of the painting undertaken by the conservation staff and the research above confirmed the suggestion that the painting was actually a transparency. The context was provided to understand why the painting had never been framed and left with its raw edges. A frame was superfluous when placed in a window one story above street level. The thinness of the paint and evidence of the paint being on both sides was necessary for the dramatic effect of back lighting for the illumination. This is also applicable for the thinness of the fabric. The lack of glazing or finishing of the painting also confirms the ephemeral nature and one would think that Frank Dunnnett would be amazed to think the painting still exists. The crudeness of the painting is less important when realising the distance between it and the observer.

With many of our questions answered it was left to Conservation to make sure the transparency could be conserved and physically able to be displayed.

The item had suffered from being folded at some stage in its past with creases in the fabric indicated by paint loss and the transfer of paint from one area to another, it was structurally stable and with appropriate treatment it would be able to endure limited display. This required flattening and re-stretching, small tears were reinforced and a strainer constructed to provide a solid backing support which enabled the original tacking margins to remain

visible when on display. This became a crucial decision in understanding how it had originally been displayed. Discussions between conservators and curators resulted in the decision to in-paint the most obvious and distracting areas of paint loss.³³

Conclusion

The large painted transparency of HRH, Prince Alfred, Duke of Edinburgh has its own part in history. For a second time in 145 years it has been revealed to the public, somewhat worn but still with a certain majesty. It commands an audience, one possibly more curious than the first adoring audience. The research has now confirmed that the large painted image is a transparency painted by Frank Dunnnett of the Survey Office for the Duke of Edinburgh’s visit in 1868. It was displayed in Hobart Town’s Grand Illumination which was finally held on 17 January after a couple of postponements due to bad weather. It was positioned in the top floor window of the Survey Office in the former St Mary’s Hospital in Davey Street. The transparency was miraculously preserved by staff at the Lands Department and fortunately recognised as significant. The Department chose to deposit it with the Museum in 1988, thereby saving it for future generations to reflect upon the patriotic exuberance with which Tasmanians greeted Prince Alfred in 1868.

The adept skills of the Museum’s conservation department, careful analysis and detective work, has meant the transparency has retained its integrity regarding its presentation. To enable its

display to the public in the chosen gallery some precautions were taken. A large polycarbonate cover protects it from dust and a substantial demountable and angled supporting structure that relieves pressure on the object itself. It only lacks the gas illumination!

The significance of this item is becoming more apparent as further information is uncovered. Illuminations were held in nearly every place that the Duke visited during his 1867–68 voyage in the *Galatea*. As part of those illuminations hundreds of transparencies were made, over 400 in Hobart Town alone. It is not known if any of these survive apart from this one.

This surviving transparency is not only a physical reminder of the first Royal visit

to Australia but is also a tangible example of the loyalty shown to the Royal Family and the ‘Mother Country’. It provides an insight into the existence of the strong ties that were still held between Hobart Town, the capital of an independent British colony and Britain. Despite the distance from Britain, it demonstrates the determination to show they were still British. The newspapers and the citizens of the colony were aware of the important opportunity to promote Tasmania as an optimal place to migrate, a place with strong resources and potential.

The crowds thronging Hobart’s streets during this first Royal Visit to Tasmania voted with their feet. Their identity lay firmly with the British Crown and the Empire.

Acknowledgements

My thanks to Jo Huxley who first brought this item to my attention and to Murray Williams for his determination to solve the mystery of the transparency by demonstrating its relevance to the exhibition. Colleagues Erica Burgess and Ruth Williams analysed the physical properties of the transparency and answered many of the questions about its construction and previous use. Also their

patience, skill and professionalism in the conservation and lateral thinking in the preparation of the transparency to enable its display were invaluable.

Thanks also to my colleague and co-curator Peter Hughes for his insight, knowledge and understanding of transparencies and the BS1 team especially Eleanor Cave. Ian Terry’s editorial advice and insight was invaluable.

Endnotes

- 1 S. Petrow, http://www.utas.edu.au/library/companion_to_tasmanian_history/E/Exhibitions.htm
- 2 J.G. Knight (1868), *Narrative of the visit of His Royal Highness the Duke of Edinburgh to the colony of Victoria, Australia*, Mason, Firth, Melbourne, , p. 210
- 3 Alfred, Duke of Saxe-Coburg and Gotha was awarded a number of honours. The decorations that he appears to be wearing in the transparency are the blue sash with the star of the Knight of the Garter, which he was awarded in 1863 and the star of the Grand Cross of the order of the Tower and Sword a Portuguese honour awarded in 1859. This had previously been described as the Knight of the Thistle which he was awarded in 1964. http://en.wikipedia.org/wiki/Order_the_Tower_and_Sword; http://en.wikipedia.org/wiki/Alfred,_Duke_of_Saxe-Coburg_and_Gotha
- 4 State Library of Victoria, Image no. a15044 photographic print: albumen silver carte de visite, on carte de visite.
- 5 E. Burgess, Conservation Report and Treatment Report, June 2011.
- 6 C. McCreery (2007), 'Long May he float on the Ocean of life': The first Royal Visit to Tasmania, 1868 *Tasmanian Historical Studies*, 12, pp. 19–42
- 7 *Mercury*, Monday morning 25 November 1867, p. 2.
- 8 *Mercury*, Monday morning 25 November 1867, p. 3.
- 9 J.G. Knight (1868), *Narrative of the visit of His Royal Highness the Duke of Edinburgh to the colony of Victoria, Australia*, Mason, Firth, Melbourne, p. 4.
- 10 *Mercury*, Tuesday 24 December 1867, p. 3.
- 11 J.G. Knight (1868), *Narrative of the visit of His Royal Highness the Duke of Edinburgh to the colony of Victoria, Australia*, Mason, Firth, Melbourne, p. 201.
- 12 *Mercury*, Tuesday, 24 December 1867.
- 13 *Mercury*, Friday morning 10 January 1868, p. 2.
- 14 *Mercury*, Saturday 11 January 1868.
- 15 *Mercury*, Saturday 18 January 1868, pp. 2, 3.
- 16 *ibid.*
- 17 *ibid.*
- 18 http://www.utas.edu.au/_data/assets/pdf_file/0004/64246/rs_28-St-Marys-Hospital-Hobart-1841-1862.pdf
- 19 http://www.utas.edu.au/_data/assets/pdf_file/0004/64246/rs_28-St-Marys-Hospital-Hobart-1841-1862.pdf
- 20 *Mercury*, Saturday 18 January 1868, pp. 2, 3.
- 21 'Piguenit, William Charles (1836–1914)', *Australian Dictionary of Biography*, National Centre of Biography, Australian National University, <http://adb.anu.edu.au/biography/piguenit-william-charles-4400/text7173>, accessed 23 June 2013.
- 22 *Mercury*, Saturday 18 January 1868, pp. 2, 3; Mr M. Chevalier is reported as the artist, this should be Nicholas Chevalier.
- 23 *Mercury*, Saturday 18 January 1868, pp. 2, 3.
- 24 Marjorie J. Tipping, 'Chevalier, Nicholas (1828–1902)', *Australian Dictionary of Biography*, National Centre of Biography, Australian National University, <http://adb.anu.edu.au/biography/chevalier-nicholas-3200/text4807>, accessed 23 June 2013. This article was first published in hardcopy in *Australian Dictionary of Biography*, Vol. 3, Melbourne University Press, 1969.
- 25 *Mercury*, Saturday 18 January 1868, pp. 2, 3, (Hobart, Tas: 1860–1954); Saturday 18 January 1868, pp. 2, 3; <http://nla.gov.au/nla.news-article8850062>
- 26 Therese Binns (2010), 'Henry Hinsby A Distinguished Apothecary of Hobart Town', pp. 120–124.
- 27 *Mercury* (Hobart, Tas: 1860–1954), Saturday, 18 January 1868, pp. 2, 3; <http://nla.gov.au/nla.news-article8850062>
- 28 Therese Binns (2010), 'Henry Hinsby A Distinguished Apothecary of Hobart Town', pp. 58–59, The Tasmanian Museum and Art Gallery also holds a medicine chest belonging to Henry Hinsby in its collection.
- 29 *Mercury*, Saturday 18 January 1868, pp. 2, 3.
- 30 *ibid.*
- 31 *ibid.*
- 32 *Mercury*, Friday 31 January 1868, pp. 2–6.
- 33 E. Burgess, Conservation Report and Treatment Report, June 2011.

THE HANNAH DYER SAMPLER

Peter Hughes

Hughes, P., 2013. The Hannah Dyer sampler. *Kanunnah 6*: 82–93. ISSN 1832-536X. A significant Tasmanian colonial embroidered sampler made by transported convict Hannah Dyer in the early 1840s was presented to the Tasmanian Museum and Art Gallery in 2012 (TMAG registration number P2012.66). The plain-weave linen is embroidered in cross-stitch with silk and woollen thread. Though small and fragile, the sampler is a poignant object that links the life of a transported convict to that of free colonists and their children, life in an unprecedented society of exiles. Though these events seem remote, there are only three generations between the original gifting of the sampler to Thomas and Eliza Sophia Tilley's second daughter, Emily and the donor's gifting it to the Tasmanian Museum and Art Gallery.

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KEY WORDS: Tasmanian colonial embroidery, transportation, convicts

Introduction

In 2012 the Tasmanian Museum and Art Gallery received by donation through the Australian Government's Cultural Gifts Program, a significant Tasmanian colonial sampler. (Fig.1) The sampler was made in the early 1840s by Hannah Dyer (1822-1906). Hannah arrived in Van Diemen's Land on the convict transport *Royal Admiral* in January 1843 and was assigned as a servant to Thomas (1801–1852) and Eliza Sophia (1804–1846) Tilley. The sampler was presented to the museum by a direct descendant of the Tilleys.

Formal description of the sampler

Almost square at 22.2 cm long and 24.4 cm wide, the Hannah Dyer sampler is relatively small and sparsely worked. The base cloth is of a coarse, plain-weave linen typically used for samplers in the nineteenth century, which is embroidered in cross-stitch in silk and woollen thread. This means that the stitches are clearly visible, there is little scope for detail and the design has a stepped, 'pixelated' quality. Hannah's sampler is bordered on all four sides with a repeating, formalised



Fig. 1. Hannah Dyer, sampler, c. 1843.

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'strawberry' pattern, a traditional sampler border that may have been copied from a pattern book. It consists of a continuous zigzag line with the points flattened embroidered in green with red strawberries in the centre of each concavity and two opposed leaves on the outer side of the line. Within this border, the upper half has four lines of

more or less centred text worked in black thread that reads:

From memorys page the hand of death
alone thy name shall blot
forsake me if thou wilt
thou shalt never be forgot

Beneath this text is the sampler maker's name, 'Hannah Dyer'. The first and last

names are pushed to either edge, suggesting that each was worked from that edge toward the centre. The lower half of the sampler contains a symmetrical composition of a central, two story house flanked by two trees with a fence running across the front; to either side of the centrally placed gateway there is a dog chained to a kennel. Typical of Georgian and early Victorian architecture, the house represented is built of red brick and is symmetrical, with a central door and a window to either side on the ground floor and three windows in the upper floor. It has a characteristic steep hipped roof and there are two symmetrically placed chimneys. The trees flanking the house are highly formalised with a fine, vertical trunk topped by a cluster of seven fruits composed of a small central disc surrounded by a circle of six equally spaced discs of the same size. Four symmetrically placed branches support a further four similar clusters. The fence posts are widely spaced, each topped with fleur-de-lys finials. Between the posts there is a continuous upper and lower rail and a single diagonal brace running between the upper right and lower left corners, making them the only asymmetrical pictorial component in the design. There are double posts and a gap at the centre signifying a gate. To either side of the gate, Hannah has worked two small dogs attached by long straight chains to kennels in black thread. Immediately above the roof and chimneys of the house is embroidered the text; 'Peacefull the cot'. 'Cot' is a contraction of cottage.

Before the widespread availability of printed books of designs for embroidery, samplers were made by professional embroiderers and needle workers to record and disseminate particular designs, effects

and motifs. In the eighteenth century, with the increased availability of printed guides and as needlework skills became a desirable accomplishment for well-to-do young women, samplers evolved into an educational tool that combined a number of outcomes. Foremost of these was the attainment and the demonstration of the attainment of needlework skills. The incorporation of letters and numbers served to reinforce literacy and numeracy, while the inclusion of a few lines of edifying text, often taken from the Bible, sermons, or hymns, provided an element of moral guidance. By the nineteenth century most samplers were made by girls and young women around the age of ten as part of their education. They most often included lines of the upper and lower case alphabets and numerals. Many samplers were also embellished with decorative borders and motifs to further demonstrate the maker's skill and judgement in design, what contemporaries would have referred to as 'taste'. Through the repetition of motifs in patterns and of other elements such as letters and numbers the embroiderer was able to demonstrate high-level craft skills and discipline by accurately reproducing identical elements or motifs.

While Hannah's sampler is typical for the mid-nineteenth century, with most of the design elements probably derived from pattern books, it is also unusual in a number of ways. The first is the age of the maker, who must have been at least twenty years old. The second is her circumstances as a transported convict and an assigned servant. The use of a snatch of popular verse for the text and the treatment of the house and grounds are also unusual for an Australian sampler.

The interwoven lives of Hannah Dyer and the Tilleys

Hannah, the fourth child of William and Martha Dyer, was baptised at St John's, Hackney on 18 May 1823. William Dyer was a weaver, an industry for which that part of London was renowned. However, from the late eighteenth century, under the pressure of cheap imports and mechanisation, weaving provided increasingly unreliable employment and erratic incomes. Hannah is unlikely to have come from a wealthy home, and this may have had some bearing on her brief career in crime. Her record states that she was twenty years old when convicted, giving her a birth year of 1822; a date consistent with her baptism but in conflict with her 1906 death notice giving her age as 82, or a birth year of 1824.¹ She is recorded as a native of Bethnal Green (London) and her Female Convict Indent, or identification description, gives her occupation as 'house and nurse maid'. She was tried at London's Central Criminal Court (the 'Old Bailey') in 1842, and sentenced to ten years transportation for stealing a considerable quantity of money and clothes, valued at over £40 (estimated at around £1800 or 2760 AUD in contemporary value). Hannah arrived in Hobart Town on the fourth sailing Royal Admiral in January 1843 and would be identified by the name and sailing of this ship while she remained under sentence in Van Diemen's Land. She was single, five foot three and one quarter inches tall, 'round' faced with a 'fresh' complexion and dark brown hair (Fig. 2):. Hannah was assigned to work as a servant in the household of Thomas and Eliza Sophia Tilley.

Family history recounts Eliza Sophia Witton emigrated to the colony to join her younger brother Joseph, (1807–1880) for whom she was to keep house. It is also told that Thomas Tilley and Eliza Sophia met on the ship on their way out and indeed the *Hobart Town Courier* lists a 'Miss Witton' and a 'Mr. Tilly' (sic) as amongst the passengers arriving by the bark *Rubicon* on 18 July, 1832.² They were married more than a year later on 19 October 1833 when both, particularly Eliza Sophia at 29 years, were quite old by contemporary standards. The delay could be partially explained by Thomas's need to establish a professional, financial and personal reputation in the colony before marrying. Newspaper advertisements suggest that he initially worked as an instrument maker for a Mr Morrison, watch- and clockmaker in Elizabeth Street.³ On 6 September 1833 Thomas advertised a partnership with a Mr Harris, brass founder, of Macquarie Street in the *Hobart Town Courier*. The advertisement describes Mr Tilley as a 'mathematical instrument maker' and the business as cleaning and repairing 'Compasses Quadrants and Telescopes &c.'⁴ The partnership was a success and Mr Tilley reported to the 1841 Immigration Committee that "When I entered into partnership with Mr Harris, we had on our books £545 the first year, £1500 the second, £2400 the third, and £3000 the fourth; ours was the only house in the trade".⁵ It is not known when or if the Tilley-Harris partnership ended; however, the statement above suggests that it lasted for at least four years, or until 1837. Advertisements from 1840 for Tilley's foundry at number 12 Macquarie Street, make no reference to Mr Harris.

NAME,	<i>Dyer Hannah</i>	No. <i>398</i>
Trade.....	<i>Asst & Nurse</i>	
Height (without shoes).....	<i>5/3 1/4</i>	
Age	<i>20</i>	
Complexion	<i>fair</i>	
Head	<i>Med. <i>W. Head</i></i>	
Hair	<i>Dark Brown</i>	
Whiskers		
Visage.....	<i>Broad</i>	
Forehead	<i>rather Low</i>	
Eyebrows	<i>Dark Brown</i>	
Eyes		
Nose	<i>Med. <i>lips thick</i></i>	
Mouth		
Chin		
Remarks.....	<i>Slightly freckled on face</i>	

Fig. 2. Convict registration of Hannah Dyer.

TASMANIAN ARCHIVE AND HERITAGE OFFICE: CONVICT DEPARTMENT, CON19/1/3

Thomas Tilley's family were established metal workers and founders in England, and Tilley and Co., owned by Thomas's brother W.J. Tilley, was a manufacturer of fire engines widely acknowledged for technological innovation. They supplied engines throughout Britain and it is surely no coincidence that in Hobart Town, Thomas Tilley was appointed Superintendent of the Tasmanian Fire Insurance Company fire engine in 1838.⁶

Sometime in the early 1840s the Tilleys commissioned portraits of themselves from Thomas Bock (1790–1855) (Figs 3

and 4). Bock was a transported convict who had been pardoned in 1832. An accomplished artist, he became the colony's leading portraitist, and the Tilley portraits were a clear indication that they had become prosperous and respected members of the community. The dress of the sitters suggests the portraits were probably painted around the Tilleys' tenth wedding anniversary in 1843. Both are represented dressed in what would have been very fashionable attire in both VDL and at home in England. Eliza Sophia's dress, though plain grey silk, is enriched



Fig. 3. Thomas Bock (1790–1855), Portrait of Thomas Tilley, 1840s.

OIL ON CANVAS, PRIVATE COLLECTION



Fig. 4. Thomas Bock (1790–1855), Portrait of Eliza Sophia Tilley, 1840s.

OIL ON CANVAS, PRIVATE COLLECTION

with ruching and pleating; the corseted bodice is clearly indicated in the painting. She is wearing a slightly transparent fine, cambric chemisette and a pearl necklace. Her cap is fashionably trimmed with lace interwoven with brightly coloured flowers. While nineteenth century men's fashions changed less and more slowly, Mr Tilley's dress is equally fashionable, as indicated by the standing collar and black silk necktie. Ostentation has been avoided and both are dressed in a manner typical of respectable, wealthy members of the upper middle class.⁷

Thomas's foundry and the family home were located at the intersection of Macquarie and Harrington streets. The Tilleys generally had between four and

five assigned servants, most of whom were men working in the foundry. Hannah Dyer seems to have been their only female servant and would have performed her familiar pre-transportation duties as house and nursemaid. Eliza Sophia Tilley gave birth to eight children, of whom the names of only six are known: Mary Anne, 1834; Emily, 1836; Thomas, 1837; Eliza, 1841; William Joshua, 1844 and Fanny in 1845. The Tilleys' headstone is preserved in the former St David's cemetery, now St David's Park (Fig. 5). It marked the grave of both Eliza Sophia and Thomas as well as 'their four infant children'. Newspaper notices record only the death of Joshua at the age of two in 1846: notices for the marriages of Mary-Anne (Hobart

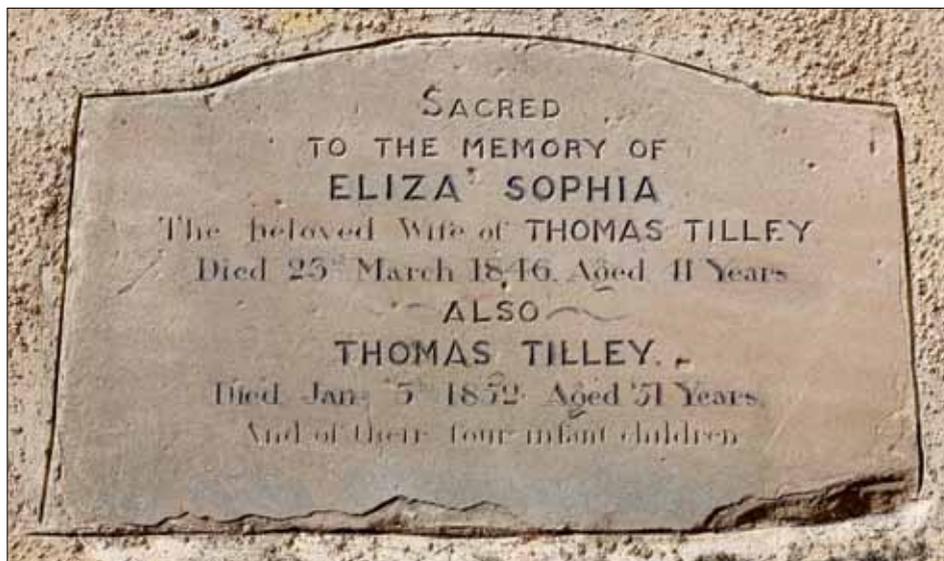


Fig. 5. Thomas and Eliza Sophia Tilley's headstone in St David's Park, formerly St David's Cemetery, Hobart.

PHOTOGRAPHER SIMON CUTHBERT, TMAG

1854), Fanny (New Town 1865), Emily (Hobart 1867) and Thomas (Melbourne 1867) indicate those who survived into adulthood.

Hannah Dyer was probably assigned to the Tilleys shortly after her arrival in September 1842. Family history provides some insight into her character and it is remembered that on arrival, she was unwilling to leave the house when her duties required it. When asked why, she explained that she was too embarrassed to be seen in the streets in her grey convict clothes. Convicts were marked out as criminal transportees doing time by their government issues 'slops' and most sought to exchange them for normal civilian dress as soon as they could. The fact that Hannah was still wearing hers suggest

that she may have come directly from the convict transport or very shortly after arrival, perhaps in response to a request to the Convict Office from the Tilleys for help with their growing family. Once Mrs Tilley had supplied Hannah with cheap cotton print dresses she was able to move freely about the town.

Hannah was returned to the Crown a little over a year later on 5 January, 1844, for being pregnant. The treatment of pregnant convicts and their children was one of the cruellest aspects of the convict system in Van Diemen's Land. In Hobart, newly arrived, incapacitated and pregnant female convicts were sent to the Cascades Female Factory in South Hobart. Intended to improve the inmates through hard labour, mostly laundering,

the Cascades factory was an unhealthy place located in a cold and damp valley. Mothers remained with their children until they were weaned at six months, later increased to nine months in an attempt to reduce infant mortality. If it survived, the child was then taken away to the Orphan Schools in New Town. An absence of records for christening or for admission to the Orphanage suggests that Hannah's first child did not live long. Hannah was back in service with the Tilley's in August 1845 when she was again returned to the Government, this time for being ten days absent without leave, on the 11th. Her convict record states that a child, Thomas, was born to Hannah around nine months later at the Cascades Female Factory on 1 April 1846. The register of births, however, records her having given birth to a girl, Elizabeth, on the same day. It is likely that the name Thomas was mis-transcribed from an adjacent record with that name. Hannah did not return to service with the Tilley's after this. However, her later marriage to one of the Tilley's assigned servants John Fogo, in 1847, lends weight to family accounts of an ongoing association. Eliza Sophia Tilley died of tuberculosis in March 1846, when her eldest child was only twelve years old. Thomas Tilley died six years later on 3 January 1852. It is said that Hannah Dyer nursed him on his deathbed and held the family together until their English relatives could be contacted for help.

Clearly none of the children was old enough to take over the foundry business; the eldest male child, Thomas, was only fifteen years old. On 26 March 1852 the contents of the foundry and a small quantity of household furniture were

advertised for sale by Mr Elliston, the auctioneer, with enquiries to be directed to himself or Mr Witton,⁸ referred to as Joseph Witton of Swiss Cottage, Bathurst Street in subsequent advertisements. The house and foundry were advertised for lease in the *Hobart Courier* on 31 March 1852⁹ and debtors and claimants against the estate of Thomas Tilley were advised to settle their accounts with Joseph Witton in an advertisement in the *Colonial Times*, 2 April 1852.

The family account suggest that, as Anglicans, the Tilley's were of a 'practical' persuasion and that Eliza Sophia may have seen it as a duty to educate and 'improve' Hannah by teaching her to write and sew. According to her indent, she was only semi-literate upon arrival, able to read but not to write. In the eighteenth and early nineteenth century, girls were often taught only those skills deemed necessary for their work; other attainments such as writing and fine needlework were thought likely to ruin them by giving them ideas above their station. If Hannah attended a pauper's school in London, she may have been taught basic sewing and to read. It would seem that Eliza Sophia Tilley sought to redress this educational deficit by teaching her convict servant writing and needlework skills, as demonstrated in her sampler, which is said to have been made alongside the two elder Tilley daughters as they worked theirs. This must have been between 1842 and 1845; Mary Anne and Emily would have been between six and eleven years old. Hannah's age may account for her use of a snatch of popular song, rather than the more sentimental and improving verse often found on samplers of this period. The embroidered lines



Fig. 6. T.J. Atkinson, Residence of John Sherwin, Macquarie Street, Hobart Town, 1838. This house is very similar to that represented on Hannah Dyer's sampler and typical of those built by well-to-do colonists in the 1830s and '40s.

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'From memory's page the hand of death / alone thy name shall blot / forget forsake me if thou wilt / thou shalt never be forgot' are taken from the song 'Oh! Am I then remembered still?' which was published in numerous versions in Britain and the United States from its earliest publication in England in 1828.¹⁰ Hannah did not include any punctuation in her text, except the capitalisation of the first letter. She excluded the possessive apostrophe from 'memory's page', the contraction commas from 'shall't' and 'will't', the semi colon at the end of 'blot' and three commas and full stop in the last line of the original song.

This may say something about the level of her literacy or simply about the difficulty of rendering small objects in cross stitch on a relatively coarse ground. In any case, given the circumstances, the sentiment of the verse has great poignancy. The song is about loss, absence and remembrance; was Hannah thinking of the relatives and friends left behind in England, about whom little is known? Or was she thinking of the Tilley family she must eventually leave?

It is difficult to determine whether the house on the sampler is a depiction or idealisation of the Tilley's Hobart home or whether it was a generic fantasy or simply



Fig. 7. H.G. Eaton, St Joseph's Church Macquarie Street, Hobart Town, T. Bluett, Hobart, 1844.

The neighbourhood of the Tilley's foundry and residence on the corner of Macquarie and Harrington streets, Hobart. The building visible on the extreme right is likely to be the foundry or house.

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copied from a pattern book. Considering that such depictions are relatively rare in Australian samplers and that the house is so typical of those built by prosperous Tasmanian colonists, and the fact that the Tilley's property was a combined house, shop and foundry, it is most likely to have been an idealised version. The style of the house is representative of Georgian and early Victorian domestic architecture; austere, symmetrical and minimally decorated). (Fig. 6) The house and foundry was situated on the corner of Macquarie and Harrington streets, diagonally opposite St Joseph's church (consecrated 1841). An 1844 print

showing the intersection gives some idea of the character of the neighbourhood. The new-built Catholic church is on one corner, a fenced garden or park occupies another, while some modest houses and commercial buildings occupy the right side of the street. Only the corner of what must have been the Tilley property can be seen to the extreme right. (Fig. 7) It shows a building standing right on the street, unlike the kind of house depicted in the sampler. When the foundry was established in the early 1830s it would have been at the edge of town but relatively close to the New Wharf, begun in 1830. By 1844 this end of Macquarie



Fig. 8. S. Spurling, Hobart Town, Carte de visite portrait of Emily Stops (née Tilley), c. 1865.

Street was beginning to be developed and the park across the road would soon be replaced by fashionable town houses. By the time Thomas Tilley died in 1852 it would have become an unlikely location for an industrial enterprise. The absence of advertisements for the sale of the property at his death, suggest both that it was leased by the Tilleys and that a foundry business was not continued at this location.

The chained dogs and kennels Hannah depicted in the front garden are unusual and it is possible that they represent a

pair of guard dogs. Despite the colony's rapid growth and prosperity, Hobart was still a frontier town in the 1840s and such security measures may have been necessary to protect not only the Tilley home, but also the foundry and its associated shop. The 1847 Census reveals that of Tasmania's total population of 70 000, a little over half were or had been convicts and less than a fifth had arrived as free settlers.¹¹ Hannah Dyer was granted her Certificate of Freedom in late 1848. She had married John Fogo the year before this but had no children with him. He died in 1857 and shortly afterwards Hannah Fogo was remarried to a free settler, Thomas Medhurst (born 1821) with whom she had three children, two surviving into adulthood.

Though small and fragile, the Hannah Dyer sampler is a poignant object that lies at the intersection of very different lives played out in the British Empire's furthest theatre – the lives of the transported convict Hannah Dyer and the free colonists Thomas and Eliza Sophia Tilley and their children. It is also an object that lies at the intersection of the tremendous forces of that Empire: Britain's deportation of a disenfranchised 'criminal' class; an ideology of improvement both in the convict system and the lives and values of individuals; the claiming and transformation of another peoples' land by a culture that was itself riven by the rapid transformations of industry and commerce; and, perhaps most poignantly the complex negotiations of life in an unprecedented society of exiles. Though these events seem remote, there are only three generations between the original gifting of the sampler to Thomas and

Eliza Sophia Tilley's second daughter, Emily and the donor's gifting it to the Tasmanian Museum and Art Gallery. Hannah gave her sampler to Emily Tilley, who passed it onto her eldest daughter

Emily Stops (Fig. 8). Emily Stops did not marry and the sampler went to Emily's brother William Joshua Tilley Stops. It was then passed to his youngest daughter, Catherine and thence to the donor.

Endnotes

- 1 1906 'Family Notices.', *The Mercury* (Hobart, Tas.: 1860–1954), 6 August, p. 1, viewed 5 June 2013, <http://nla.gov.au/nla.news-article12823957>
- 2 1832 'TRADE AND SHIPPING.', *The Hobart Town Courier* (Tas.: 1827–1839), 22 June, p. 3, viewed 6 June 2013, <http://nla.gov.au/nla.news-article4198166>
- 3 1833 'Classified Advertising.', *The Hobart Town Courier* (Tas.: 1827–1839), 6 September, p. 3, viewed 22 May 2013, <http://nla.gov.au/nla.news-article4190017>
- 4 1833 'Classified Advertising.', *The Hobart Town Courier* (Tas.: 1827–1839), 6 September, p. 3, viewed 22 May 2013, <http://nla.gov.au/nla.news-article4190017>
- 5 R.M. Hartwell, (1954), *The Economic Development of Van Diemen's Land 1820–1850*, Melbourne University Press, p. 152.
- 6 1838 'Classified Advertising.', *The Hobart Town Courier* (Tas.: 1827–1839), 24 August, p. 1, viewed 22 May 2013, <http://nla.gov.au/nla.news-article4162962>
- 7 Assistance in interpreting the Tilley's' dress given by Sonia Heap.
- 8 1852 'Advertising.', *Colonial Times* (Hobart, Tas.: 1828–1857), 26 March, p. 1, viewed 5 June 2013, <http://nla.gov.au/nla.news-article8771125>
- 9 1852 'Classified Advertising.', *The Courier* (Hobart, Tas.: 1840–1859), 31 March, p. 4, viewed 5 June 2013, <http://nla.gov.au/nla.news-article2959277>
- 10 *The Melodist and Mirthful Olio; AN ELEGANT SELECTION OF THE MOST POPULAR SONGS, RECITATIONS, GLEES, DUETS, &c. &c.*, Vol. 1, H. Arliss, Cheapside, London, 1828, pp. 47–8.
- 11 <http://www.abs.gov.au/ausstats/abs@.nsf/7d12b0f6763c78caca257061001cc588/e743fe07252b0081ca256c3200241879!OpenDocument>. Viewed 6 June 2013

TWO IMPORTANT WHALE-TOOTH IVORY OBJECTS FROM FIJI, HIDDEN UNDER THE SOBRIQUET OF “SCRIMSHAW” IN THE W.L. CROWTHER LIBRARY COLLECTION, HOBART

Rod Ewins¹

Ewins, R., 2013. Two important whale-tooth ivory objects from Fiji, hidden under the sobriquet of “scrimshaw” in the W.L. Crowther Library Collection, Hobart. *Kanunnah* 6: 94–107. ISSN 1832-536X. Two whale-tooth ivory objects located in the W.L. Crowther Library Collection are identified as typical Fiji presentation *tabua*. Whale teeth, most particularly the large teeth from the lower jaw of the Sperm-whale, are highly regarded when presented formally in a solemn ritual. One of the objects appears to be ritualistic and used in exchange to satisfy the spirit of generous group sacrifice without the concomitant obligations carried by establishing real kinship. The second object, a crescent-shaped pendant, is believed to have originated from a politico-religious movement, called Tuka, in the eastern highlands of Vitilevu, Fiji. This particular whale-tooth is of historical and documentary significance and value. It may be the only known example of these celebrated “message teeth” to have survived..

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KEY WORDS: Fiji, scrimshaw, presentation *tabua*, Tuka movement

Introduction

Because of my long research into things Fijian, over my 45 years of residence in Tasmania I have attempted to familiarise myself with all of the objects and documents relating to Fiji in the various libraries and museum collections around the State.² One valuable source of reference material is the W.L. Crowther Library

Collection, housed in Hobart in what was formerly the State Library of Tasmania, now part of LINC Tasmania.

The W.L. Crowther Library Collection and its Fiji whale-teeth

The Crowther Library was built on the collection of Sir William Edward Lodewyk Hamilton Crowther (1887–1981), who

donated some 15 000 items to the State Library of Tasmania between 1964 and his death seventeen years later. He had a lifelong interest in natural history and collecting, and his substantial collection included a considerable body of literature, and some objects, that were Pacific-related. His interest ran in the family, both his grandfather for whom he was named, and his father Edward Lodewyk, had been keen amateur ethnologists and collectors. However, it was Sir William who amassed the very substantial collection that is the W.L. Crowther Library today.³

In searching the Crowther Library database I found numerous publications but no *objects* listed as being from Fiji. Fortunately, however, in the early 1990s the Library put on public display a piece from its “scrimshaw” collection that I immediately identified as being *not* scrimshaw but an important carved whale-ivory pendant from Fiji. I was in the process of writing a book on the social role of Fijian art, and because it was quite relevant to the discussion, I described and illustrated this pendant in it (2009: 215 and Plate 3b).

Since that time, there has been the happy addition to the catalogue of thumbnail photographs of most articles, and in late 2012 when I had the opportunity to have a look through these, I quickly discovered two typical Fiji presentation *tabua*, both also described as scrimshaw and not localised.⁴ One was always unremarkable and is now much damaged, but the other looked interesting, so I sought the assistance of library staff to allow me to examine it closely and photograph it, as I had previously done with the pendant. It was during this process that I discovered that this too is no ordinary *tabua*, but

very possibly a most interesting piece of Fiji’s history. So, because of Sir William’s enthusiasm for scrimshaw, two important Fijian objects have inadvertently found their permanent home in Tasmania.

The importance of the whale tooth in Fiji

Before moving to a detailed description of the two teeth and why they are so important, I should give some contextual information. Whale teeth from a number of species of Odontoceti (toothed whales), most particularly the large teeth from the lower jaw of the Cachalot or Sperm-whale (*Physeter macrocephalus*), are inordinately prized in Fiji. Sperm-whale teeth, and also the ivory obtained from them if they are re-fashioned, are referred to in Fiji as *tabua* (pronounced tah-m-boo-uh). When presented formally in a solemn ritual, the *tabua* is certainly their most powerful talisman, believed to have great effectiveness in achieving many profound social and spiritual objectives, an effectiveness conveyed by the word *mana*, which they are said to possess.⁵ The ivory may be used for many purposes, but the products are always imbued with a level of spiritual importance, even though the same object used in the same context but fashioned from wood or shell might possess much less inherent significance. They were once capable of purchasing literally any service or expunging any offence. They still today carry great significance, and to accept a *tabua* is to acknowledge a strong connection between the person (or group) presenting it and the receiver. It may also impose an obligation on the recipient group or individual’s part.

On occasion, *tabua* might also come to be considered to be the repositories, or shrines, of the most powerful spirit of a place, as in the case cited by Rev. Royce in Kadavu:

This morning the Kadavu god was brought to me. It had been kept secret till the present time; the god is no more nor less than a fine whale's tooth, and by appearance and report [is] a venerable fellow.

(Royce 1855–62: 354)

Cited in Tomlinson (2012: 215)

The antiquity of such ascribed importance is unknown, though various hypotheses have been, and continue to be, advanced. Most interestingly, it has been only recently pointed out that one whale-tooth in Cambridge, collected in Ha'apai, Tonga by a missionary in 1836, was also labelled as being considered the repository of a god (Clunie 2013). Oral tradition has been recorded to show that such a tooth would serve as a transit between the god and his priest at times of divination (Gifford (1929) 1971: 304 cited by Clunie op. cit.). So it is clear that, by the beginning of the nineteenth century, whale teeth were of singular spiritual importance in both Tonga and Fiji, though whether this originated in Tonga and was adopted in Fiji, as Clunie concludes, or was part of the great amount of borrowing from Fiji into Tonga in the eighteenth century,⁶ probably can never be proven at this time, beyond inductive theorising. Indeed, the roots of this spiritual significance could conceivably lie to Fiji's northwest, in islands on the path of the first immigrants, such as the Western Solomons where they were associated with their ancestral religion and death (Richards 2006). It is all speculative.

While it is clear that whale-teeth were in widespread use long before regular Western incursion into Fiji commenced at the end of the eighteenth century, there was no indigenous whaling carried on in this part of the Pacific, unlike the Northwest Coast of North America where the Inuit people had long harvested migratory whales for food, bone and ivory. For the deeply interconnected societies of Fiji and Tonga, the source of whale-bone and teeth was limited to natural strandings, until Yankee, Australian and other whaling ships came into their waters, chasing the whales whose migratory paths took them up between and through those island groups.

It has been suggested that Fiji's whale teeth originally came from Tonga (Tonganivalu [Toganivalu] 1917), and more recently, that whales did not frequently wash up on Fiji reefs (e.g. Thomas 1991: 110). However, Fiji's waters are actually more reef-strewn than Tonga's (hence the great trepidation with which early sailing ships entered them), and certainly these great creatures were, at least before the predations of whaling, plentiful in Fiji waters, so strandings did, and continue to, occur there. The captain of the U.S. Exploring expedition, Charles Wilkes, recorded the following notes in his journal while enroute from Fiji's solitary township at that time, Levuka, and the port of Savusavu, on the south coast of Vanualevu. He was, therefore, virtually in the geographical centre of Fijian waters, as signified by the Fijian name for this area, Lomaiviti (the middle of Fiji).

On our way across, we saw a school of sperm whales. These begin to frequent the seas around these islands in the month of July, are most plenty in August

and September, and continue about the reefs and islands four or five months. I am informed that they are frequently seen from the town of Levuka, near the harbour and adjacent reefs. It seems remarkable that the natives of these islands, who value whales' teeth so highly, should have devised no means of taking the animal that yields them, although it frequents their seas for three or four months in the year. The chiefs, of whom I inquired, seemed to show an ignorance upon the subject that I was a little surprised at. Although daring navigators in other respects, they showed a great difficulty in comprehending the mode of capturing whales. Their canoes would not be adapted to this object, being easily overturned, and, as yet, they have but little intercourse with whaleships.

(Wilkes 1845: 194)

That infrequent intercourse was already changing as he wrote, and when they did come in large numbers, whalers were quick to capitalise on the enormous store placed by Fijians on the sperm-whale teeth. Indeed, so many teeth entered the Fijian system that the political balance was profoundly affected. Chiefs with access to large numbers of teeth (such as the confederation centred on the island of Bau) had an enormous advantage over those with little or none, when seeking alliances in warfare or other forms of enrichment for themselves and their polities.

Despite the religious use and significance of whaleteeth in Tonga, there they had fine mats and other *koloa* valuables to occupy the social roles that *tabua* also performed in Fiji, so the obsession with teeth appears not to have been so profound.⁷ Therefore,

Tongans had a sufficient surplus to permit them to develop a lively trade in teeth to Fiji, and by the mid-nineteenth century, the carvers of Ha'apai were also trading many other articles they fashioned from whale ivory.

Processing the *tabua*

Only the lower jaw of the Sperm-whale bears teeth, while the upper jaw has sockets into which these fit. They range from modest-sized teeth of only about 13–15 cm long, to huge objects well over 20 cm long, as well as thick and deep and weighing up to a kilogram or more.

After being chopped out of the jaw of a dead whale, the tooth is carefully polished and sometimes ground to shape. The shaping (or in some cases carving into other forms) was carried out by male specialists using the same toolkit used for wood-carving,⁸ since whale ivory is a relatively soft and easily-worked material. Prior to the introduction of Western steel tools, the first rough forming was done using rasps made from coral, moving from coarse to finer, and then moving to a finer rasp made of stingray skin stretched over a short length of wood. Any detailing would be done using gimlets made from fish teeth and sharks' teeth. For "emery cloth" recourse would be had to a plant, the Horsetail (*Equisetum debilis*), appropriately named in Fijian *masinitabua* or "scrubber of *tabua*". The outer bark of the stem of this plant is strongly impregnated with silica, giving it an abrasiveness suitable for polishing ivory and wood.⁹ Final polishing would be done using the rough leaves of certain figs (*Ficus scabra* and *Ficus aspera*), finally adding coconut oil lubricant.



Fig. 1. Beached Sperm whale, showing lower jaw teeth and upper jaw sockets.

FROM A PHOTOGRAPH BY DIRK CLAESEN

[HTTP://UPLOAD.WIKIMEDIA.ORG/WIKIPEDIA/COMMONS/F/F3/DIRK _ CLAESEN _ - _ SPERM _ WHALE.JPG](http://upload.wikimedia.org/wikipedia/commons/f/f3/Dirk_Claesen_-_Sperm_Whale.jpg) (ACCESSED 25.3.2013)

The teeth might be fashioned into inlays for clubs, wooden headrests etc., and various pieces of ivory jewellery. perhaps the most singular of which will be discussed below. Small teeth could be strung together as necklaces, or worn singly as pendants, either further carved or simply suspended by a finely woven and sometimes ornamented cord – usually passed through a single hole drilled on one aspect of the root end, so as to allow the tooth to lie flat against the chest, curving to one side or the other. Large teeth were sometimes sawn into long tapering units that were ground to cylindrical form, polished and bound together to form outward-curving gorgets, handsome objects that originated in Fiji but were adopted and made throughout the Fiji/Tonga/Samoa cultural and trading complex.¹⁰

The female element in *tabua*

I have elsewhere discussed at some length what I consider to be the female denotation inherent in *tabua* (Ewins 2009; 2013: in preparation). This relates to the resonance, indeed symmetry, between male and female elements in Fijian society. The manner in which *tabua* came to perform a critical, in fact principal, role in this regard is difficult to deduce from current usage, since on the face of it, *tabua* appear to be quintessentially male objects – certainly they are produced, controlled and presented by males. I do not suggest that modern-day Fijians consciously relate the *tabua* to women or to the “female element,” but a “female equivalence” was indeed proposed long ago by both Hooper (1982: 133–4) and Clunie (1986: 160–61),



Fig. 2. Carved whale-ivory pendant.

AUTAS001127117596, PHOTOGRAPH © ROD EWINS 2005, COURTESY OF W. L. CROWTHER LIBRARY & ARCHIVES

going so far as to suggest that a *tabua* may originally have been considered a surrogate woman.¹¹ As such, *tabua* could function in ritual exchange as though they *were* women, satisfying the spirit of generous group sacrifice without the concomitant obligations carried by establishing real kinship, first affinal and finally sanguinal in the form of offspring. Such signification can really only be surmised, however, and modern Fijians understand the deep spiritual undertones of such presentations, but know nothing of their origins.

Most interesting in this context is the existence of apparently very old whale-

ivory pendants with a nipple carved on the distal end, and vulva on the other (Plate 3b, and see also the examples illustrated in Clunie 1986:68–9). Genitalia are among humanity’s longest-used signs, widely denoting gender, reproduction and fertility, and thus the biological continuity and inter-group connection that women afford in such kinship-based societies. The cords on those examples that still possess them are relatively fine plaited or twisted sennit or hibiscus fibre, rather than the heavy four-strand plaited sennit cord that is customary on prestation *tabua*. Also, the suspension holes are drilled in the

centre of the body of the object rather like Japanese netsuke, rather than in the ends as is the case with *tabua*. Both facts suggest that they were indeed worn as pendants rather than functioning solely as ritual objects as *tabua* do today, but this does not rule out the possibility [even likelihood] that these ancient small objects performed both roles.

Clunie mentions “intermediate” forms of *tabua* which draw the connection close, and it seems entirely plausible that ... [after long usage] the need for representative specificity faded, and the tooth with cord came to transcend pure surrogacy, becoming a sign for the female element in nature, and cosmic generativity generally, ... [thus] simultaneously engaging the spiritual and temporal worlds.

(Ewins 2009: 122)

It was very exciting for me, therefore, to find one of these small pendants in the Crowther Library. It is absolutely as described in the quote above, lacking only the fibre suspension cord.

I have never seen a photograph of one of these pendants being worn, but I assume they would have been worn in similar fashion to the white cowry in the next photograph, which was tied to a white barkcloth choker using a piece of hibiscus cord. The whale-ivory pendant might have been worn similarly attached to a choker (quite elaborate forms of which were fashioned from shells and shell or coral beads), or the hibiscus cord could be long for wearing the pendant on the upper chest instead. The shell in the photograph, *Ovula ovum*, also has considerable spiritual significance in Fiji and the wider Pacific. Similarly to whale ivory, its use is



Fig. 3. White cowry pendant, a chiefly fertility symbol which shares some features with the Crowther whale-ivory pendant, which might have been worn in this manner. The young woman is Marica Va’aselamu Varani, member of the chiefly clan of Natewa village, Vanualevu Island, Fiji.

PHOTOGRAPH © ROD EWINS 1981

generally reserved for religious or chiefly purposes, and it too is a fertility symbol, undoubtedly related to the often-noted female genital appearance and colour of its orifice. To draw this analogy closer, some of the whale-tooth pendants have the lips grooved to resemble the crenellated orifice of a cowry (see Clunie 1986: 68, 160 Photo 113).

Presentation *tabua*

For a presentation *tabua*, when processing is complete, holes are drilled in either end of the tooth (again using the gimlet), through the tip from side to side, and on the “gum” end of the concave curve of the tooth. To these holes are tied the ends of a stout sennit cord, normally square-plaited.¹² This is *not* a suspension cord for wearing the object round the neck (for which purpose it is generally too short anyway), and such a *tabua* is virtually *never* worn as a piece of jewellery, contrary to the description in many museum catalogues as a necklace or “breast ornament.” In fact, it is reserved for the presentations that are an essential part of all very solemn and serious ceremonies in Fiji. As seen in the following photograph, during these presentations, the cord is held in one hand, the tooth in the other, and the presenter uses very formal language that uses the cord as an analogy for the bonds between their two people, consistent with the metaphorical exchange of women.

Most of the *tabua* that have found their way into public and private collections in countries outside Fiji were presented to government officers on official business, or other visitors deemed important enough to warrant the signal honour of receiving one or more. Many were passed along as these recipients continued to pursue the exchanges essential to their work, but other teeth were carried “home” and out of the circulation network within Fiji. However, probably thousands still pass from hand to hand each year, always with solemn ceremony.

The Crowther presentation *tabua*

Exactly how and when this particular *tabua* found its way into the Crowther

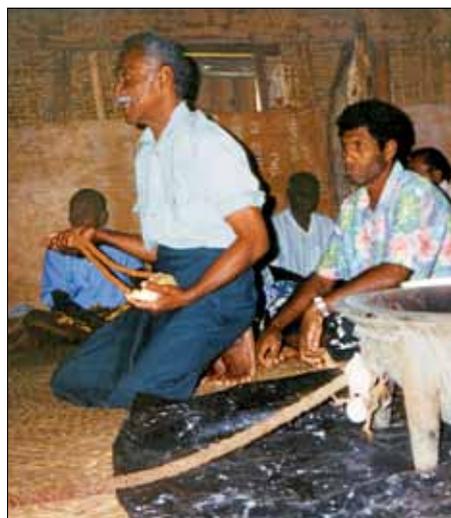


Fig. 4. Rātū Semi Bosewaqa, the Tui Namō (High Chief) of Lomanikaya village, Vatulele Island, giving the speech to ritually present a *tabua*, in this case as part of a chiefly kava ceremony (*yaqona vakaturaga*). Note also the white cowries attached to the base of the sennit cord on the *tānoa* kava bowl (which is stretched toward the highest-ranked recipient), amplifying the messages conveyed by the *tabua*.

PHOTOGRAPH © ROD EWINS 1993

collection I have been unable to discover, and unfortunately Sir William did not leave detailed notes about the provenance of his collected objects. His interest in scrimshaw and other things associated with whaling came in part from his boyhood when he habituated the waterfront of the busy port of Hobart, and also via his surgeon grandfather. William Lodewyk Snr. The latter, though an eminent surgeon, was entrepreneurial in business, and at times during the period 1825–1870 he owned a fleet of trading ships that sailed to many Pacific destinations. Among these, at one



Fig. 5. Fijian presentation *tabua*.

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Fig. 6. Detail of Fijian presentation *tabua*.

AUTAS001127114833, CRO, STORE L11, PHOTOGRAPH © ROD EWINS 2012, COURTESY OF W.L. CROWTHER LIBRARY & ARCHIVES

stage he owned no less than seven whaling ships, a fact that Sir William celebrated in an address he delivered at the annual meeting of the Tasmanian Branch of the British Medical Association on 13 February 1943 (Crowther 1943). The pendant is very possibly the older object despite its being in better condition, and it may well have been alienated from Fiji quite early, even perhaps coming direct from Fiji courtesy of one of William Snr's ships' officers. However, in light of the date I will propose for the presentation *tabua* being used within Fiji before being removed, it is likely that it was obtained later by Sir William himself, perhaps exchanged with other collectors or purchased from dealers.

The crescent in Pacific art and Fijian *tabua*

My interest in this object was initially aroused because unlike many museum examples it retains its sennit cord, is well worn and has been ground into an almost complete crescent form, which is regarded by Fijians as a *beau idéal* for *tabua*. It has been suggested that the widespread use in many cultures of the crescent is a symbol "of fertility because it represented the fertilising moon."¹³ That would be entirely consistent with the suggestion I have advanced above, that the potency of the *tabua* in Fiji may have its origins as a symbolic

vehicle for the “female element,” also embodying fertility. And there is further evidence that the new moon was indeed recognised as the basis for the preferred status of crescentic *tabua*. In the case of the “shrine” *tabua* mentioned earlier, Royce went on to say:

Its name is Takei, from *takelo*, [meaning] crooked, being curved like the new moon. It is said to have been the god of food, and always to dwell in the land of plenty. If ever there was a scarcity [*sic*] of food on Kadavu, or in the case of war, it was conveyed to some distant island and only returned when peace and plenty were restored.

(Royce, *op. cit.*)

So the connection with the new moon, and with abundance (albeit somewhat idiosyncratically), were clearly in play.¹⁴ Perfectly symmetrical crescentic *tabua* do exist, but perhaps understandably considering the labour involved, and the size and form required in the original tooth to make them suitable for such re-shaping, they are not common. Most *tabua* are merely polished and drilled, with no further modification, and the flaring gum-insertion and hollow nerve-channel are still obvious.

Though this particular example is not perfectly symmetrical (the “gum” end has not been completely ground down), most of the *tabua* in circulation are far less carefully shaped than this. Nonetheless, if its age and shape were all there was to this tooth, it would not be particularly remarkable, since there are many *tabua* in collections that are finer and more perfectly formed.

A link to a most important chapter of Fijian colonial history

There is, however, one feature of this tooth that suggests that it is indeed remarkable, and that is revealed in a word that is incised near the tip of the tooth. On first seeing this, I assumed it was an owner’s name, since it is not uncommon for owners to incise their names on *tabua*, establishing at least transitory ownership. Sometimes several names can be found on a single tooth. The Australian Museum in Sydney has listed seven names “and others.”¹⁵ However, closer inspection revealed that the word in this case is TUKA.¹⁶

Tuka is not a person’s name, though it can be part of compound words meaning grandparent. However, there was from about 1860 on, what has been dubbed a millenarian movement called Tuka, in the eastern highlands of Vitilevu, Fiji. In this context, *tuka* meant immortality, which was promised to adherents of the politico-religious movement. With a rhetoric of reclaiming their hegemony over their own lands and people, when the Tuka adherents started assembling and drilling troops the British authorities arrested and deported the “prophet” Mosese Dugumoi, to Rotuma.¹⁷ This failed to deter his followers in his home village of Drauniivi, however, and in the late 1880s they started sending *tabua* far and wide to garner support for their cause (Brewster 1891, Kaplan 1990;1995).

Sending *tabua* from one place to another is not of itself a very unusual activity, and it probably would not have attracted undue attention from the authorities had they become aware of it. But the incision of the word “TUKA” on the *tabua* would have made the message quite unambiguous to the receiver. Such

is the potency attaching to *tabua* that if accepted, the recipient would have been bound irrevocably to the cause.¹⁸ Brewster (*op.cit.*) made the observation that these *tabua* performed a comparable function “to the Chupatties [*sic*] of the Indian Mutiny.” Importantly, the case that a “mutiny” was being planned by the Tuka adherents was undoubtedly stronger in the minds of the colonial administration than could, then or now, be established empirically for the Tuka members.

However, speech that was interpreted rightly or wrongly as seditious by the colonial government, and that was plainly attracting great support, was sufficient to cause pre-emptive moves on the government’s part. Finally, determined to respond but wishing to employ a less draconian response than that shown the highlanders during the 1870s (when the Gordon government declared all-out war on those resisting their authority), the Governor determined to relocate the entire village for a time from their hard-to-control mountain fastness, to rich Crown

land on the distant island of Kadavu. This must have seemed to the Governor to be a generous response, but it took no account of the Fijian’s attachment to place (there are many discussions of this in the literature, but see for example Ewins 2009: 22, 37–9). When the administration considered that their “threat” had abated, after an absence of 18 years, the people were permitted to return and re-establish their village. It would appear from the research conducted by Kaplan (*op. cit.*) in the 1980s, that to this day the highlanders of that area still hold many, perhaps all, of the prophecies and beliefs of Navosavakadua to be true. Their identity and sense of agency and self-worth, indeed, depend on this belief. While I doubt it will ever be able to be proven categorically, if as I strongly suspect this particular whale-tooth is one of those circulated by the would-be reformers of the Tuka movement, it has a historical and documentary significance and value that far exceeds its being merely a nice specimen. I know of no other example of these celebrated “message teeth” having survived.

Acknowledgements

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incised inscription being a person’s name. However, he bears no responsibility for any further conclusions I have drawn. I also thank Professor Martha Kaplan for reading an earlier draft of this paper, correcting a couple of factual errors I had made in relation to the Tuka movement, and making other useful comments. She is the pre-eminent authority on this topic and I am grateful for her review and input.

Endnotes

- 1 Dr Roderick Ewins is a retired academic from the Tasmanian College of the Arts, University of Tasmania, where he continues as an honorary researcher. Born and raised in Fiji, he has for over 30 years been researching and writing about the art and material culture of the indigenous *Itaukei* people of Fiji.
- 2 This resulted in a book about the Tasmanian Museum & Art Gallery's collection (Ewins 1982), a revised 2nd edition of which is scheduled to be published shortly.
- 3 See the Australian Dictionary of Biography Online: <http://adb.anu.edu.au/biography/crowther-sir-william-edward-lodewyk-hamilton-12374> – accessed 23 February 2013.
- 4 Marian Jameson usefully detailed Tasmania's scrimshaw collections (1998), particularly those of Crowther. A copy of her thesis is held in the LINC Tasmania library, Hobart, as well as the James Cook University Library.
- 5 *Mana* is a word used in all Polynesian languages, but its meaning is not consistent. In a Fijian context, it should be understood to mean effectiveness, no more nor less, though context may impart various overtones to that, as it does in the case of *tabua*. A good recent discussion of its meaning in Fiji is that in Tomlinson (2006).
- 6 As documented for numerous objects and customs, by the early observer in Tonga, William Mariner (Martin & Mariner 1981, 2006–08).
- 7 Perhaps for this reason, though the religious significance of the teeth was displaced (or at least driven underground) by the advent of Christianity in both Fiji and Tonga, only in Fiji did they still have the strong social role that could maintain their supremacy among Fijian wealth. I am informed that in Tonga today, whale teeth only have special significance for certain noble families, particularly those with Fiji connections. Among other classes of Tongans, they have no value as ritual gifts (pers. comm. Ping-Ann Addo, May 2013).
- 8 Mariner stated that in Tonga, the ivory carving was principally done by canoe builders (Dale 2006–8: 390).
- 9 Even more curiously, perhaps, these plants also contain small amounts of gold – but that is not relevant to their use as abrasives.
- 10 The Fijian origin of these is confirmed linguistically (Paul Geraghty, pers. comm. 2012) and by the very early eyewitness account of William Mariner, who was cast away in Tonga and lived there between 1805 and 1811. He wrote that "*Fono*' [is] carving ornaments using whale teeth, for the neck wear, and inlaying clubs, etc. with the same material. This art, as far as it regards ornaments for the neck, is of Fiji origin; but inlaying clubs, wooden pillows etc., is [Tongans'] own invention." (Dale 2006–08: *ibid.*)
- 11 The case for equivalence is made stronger by the fact that formerly, women given between tribes to cement alliances in war were called *tabuanivalu* – "war *tabua*." (Capell (1941) 1973: 210)
- 12 Sennit is plaited by men using coir fibre from a variety of coconut palm with a very long nut. The nut is husked when mature but still green, and the husk roasted in an earth oven (sending it red-brown). It is then shredded and the fibres "spun" between hand and thigh. The resulting thread is plaited into fine three-strand plaits, and these are in turn plaited into square cord.
- 13 Skinner (1943: 136).
- 14 Tomlinson (*op. cit.*; 216) proposes to explain the apparent idiosyncrasy as Takei not ensuring peace and plenty, but indexing them. Fijian thought on such things is often elliptical, so I perceive no inherent contradiction. As an aside, there is even a report of one crescentic stone object from Komave, on the Nadrogā coast of Vitilevu (today referred to as the "Coral Coast"). (Geddes (1945) 2000: 47)
- 15 McCarthy (1953: 96). The practice might be compared to the owners' seals that were printed on the margins of Japanese woodblock prints, sometimes becoming quite numerous as the prints changed hands between collectors.
- 16 The strange way of forming a "T" from two triangles and a vertical is not uncommon on such early inscriptions – most commonly they would have been incised with a sharp knife, not engraved, and this would have placed constraints on the use of curves, and also perhaps made the maker feel that the thin lines of a simple "T" shape would not be sufficiently bold.
- 17 Mosese's *nom-de-guerre*, as it were, was Navosavakadua, which I would translate as something like "the final word".
- 18 The most celebrated example of this sort of power being brought to bear against foreigners was that in which a *tabua* was sent ahead of the Wesleyan missionary Rev. Thomas Baker on a trip he took into the highlands of Vitilevu, securing his murder by a chief who finally accepted the tooth. The story was fictionalised by Jack London in his *South Sea Tales* (London 1912) as "The Whale Tooth" <http://www.literature.org/authors/london-jack/south-sea-tales/chapter-02.html> (Accessed 25 February 2013). On two separate occasions since, descendants of the chief responsible have sought to expunge their inherited guilt, again by presenting *tabua*, first to the Methodist Mission in Fiji, and quite recently, to the descendants of the unfortunate Rev. Baker.

References

- Brewster, Adolph B., "Superstition in Fiji", in *The Australasian*, 17 October 1891.
- Capell, A., (1941, 1973), *A new Fijian dictionary*, Suva: Government Printer.
- Clunie, Fergus (1986), *Yalo i Viti*, Suva: Fiji Museum.
- Clunie, Fergus (2013), "The Tongan *tapua*", in Herle, Anita & Lucie Carreau, eds. Cambridge: Museum of Archaeology & Anthropology. pp. 23–4.
- Crowther, William E.L.H. (1943), "A surgeon as whaleship owner", in *The Medical Journal of Australia* 1(25): 549–54.
- Dale, Paul W. (2006–08), "The arts and manufacturing", Ch. 9 in *The Tonga Book. February 1805–June 1811* [William Mariner] Fideli Publishing, pp. 388–400.
- Ewins, Rod (1982), *Fijian Artefacts: the Tasmanian Museum and Art Gallery Collection*, Hobart: Tasmanian Museum & Art Gallery.
- Ewins, Rod (2009), *Staying Fijian: Vatulele Island barkcloth and social identity*, Adelaide & Honolulu: Crawford House Publishing & University of Hawai'i Press.
- Ewins, Rod (2014) (in preparation), *Fijian Artefacts: the Tasmanian Museum and Art Gallery Collection*. (2nd Edn, Rev.). Hobart & Suva: Tasmanian Museum & Art Gallery and USP Press.
- Geddes, William Robert, (1945, 2000). *Deuba; a study of a Fijian village*, (Polynesian Society Memoir no. 22), Suva: University of the South Pacific (Institute of Pacific Studies).
- Gifford, E.W., (1929, 1971), *Tongan society*, (B.P.Bishop Museum Bulletin No. 61, Bayard Dominick Expedition Publication No. 16), New York: Kraus Reprint Co.
- Hooper (as Phelps), Steven J. (1982), *A study of valuables in the chiefdom of Lau, Fiji*. Ph.D. thesis. University of Cambridge, Cambridge, UK.
- Jameson, Marian (1998), *A guide to scrimshaw in Tasmanian collections and the legacy of Sir William Crowther*, Grad. Dip. Museum Studies thesis. James Cook University, Townsville, 147 pp.
- Kaplan, Martha (1990), "Meaning, agency and colonial history: Navosavakadua and the "Tuka" movement in Fiji", in *American Ethnologist* 17(1): 3–22.
- Kaplan, Martha (1995), *Neither cargo nor cult: ritual politics and the colonial imagination in Fiji*, Durham (N.C.) and London: Duke University Press.
- London, Jack (1912), "The whale tooth". Ch.2 in *South Sea tales* London: Milla & Boon, Limited. <http://www.literature.org/authors/london-jack/south-sea-tales/chapter-02.html>
- McCarthy, Frederick D. (1953), "The whale's tooth tambua of Fiji", in *The Australian Museum Magazine* (15–09): 95–99.
- Martin, John & William Mariner (1981), *Tonga Islands: William Mariner's account*, 4th edn., Neiafu (Tonga): Vava'u Press (Originally published 1817 London, Constable).
- Richards, Rhys (2006), "Whale teeth artefacts in the western Solomon Islands", in *Tuhinga* 17: 69–79.
- Royce, James S., 1855–62. "Journal November 1855–April 1862", in Mitchell Library (microfilmed). Sydney.
- Skinner, H.D. (1943), "Maori amulets in stone, bone and shell", in *Journal of the Polynesian Society* 52(3): 132–52.
- Thomas, Nicholas (1991), *Entangled objects: exchange, material culture and colonialism in the Pacific*. Cambridge Massachusetts: Harvard University Press.
- Tomlinson, Matt (2006), "Rethorizing Mana: Bible translation and discourse of loss in Fiji", in *Oceania* 76(2): 173–85.
- Tomlinson, Matt (2012), "Passports to Eternity: whales' teeth and transcendence in Fijian Methodism", in Manderson, L., Smith, W., & Tomlinson, M. (eds) *Flows of Faith*: New York, Springer, pp. 215–31.
- Tonganivalu [Toganivalu], Ratu Deve (1917), "*Ai yau kei na i yaya vakaviti* (Fijian property and gear)", in *Transactions of the Fijian Society* for the year 1917: 1–18.
- Wilkes, Captain Charles (1845), *Narrative of the United States Exploring Expedition during the years 1838–1842*, v. 1–5, Vol. 3, Fiji. Philadelphia: Lea & Blanchard.

A NEW ALPINE SPECIES OF *CALOPLACA* (LICHENISED ASCOMYCETES) FROM TASMANIA AND NEW ZEALAND

Gintaras Kantvilas and Ulrik Søchting

Kantvilas, G. and Søchting, U., 2013. A new alpine species of *Caloplaca* (lichenised Ascomycetes). *Kanunnah 6*: 108–113. ISSN 1832-536X. The new species, *Caloplaca epibrya* Kantvilas & Søchting, is described and illustrated. It is superficially similar to the Northern Hemisphere species, *C. nivalis* (Körb.) Th. Fr., but is distinguished by its smaller, simple to rather spuriously septate ascospores, 10–19 x 4–6.5 µm. It has a scattered distribution in Tasmania's central highlands and has also been recorded from the South Island, New Zealand.

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Introduction

The genus *Caloplaca* is characterised by a chiefly crustose, squamulose or placodioid thallus containing a trebouxiod photobiont, apothecial ascomata, usually eight-spored asci of the *Teloschistes*-type, and hyaline, non-halonate ascospores that are typically 2-celled, with a thick septum, pierced by

a narrow channel (termed polaridiblastic). Most species have a brightly orange-, red- or yellow thallus, hypothallus and/or apothecia, and contain anthraquinone pigments that give a characteristic crimson reaction in KOH. In the broad sense, *Caloplaca* is probably one of the largest genera of lichens, estimated to consist of more than 1000 species (Arup *et*

al. 2013). However, in recent years it has been the subject of phylogenetic studies using DNA sequence data (e.g. Gaya *et al.* 2012), which have revealed that the genus is heterogeneous and can be subdivided into numerous, more natural units. Thus, Arup *et al.* (2013) recognised 39 genera within '*Caloplaca*' in the traditional sense, and further subdivision is likely to occur in the future. However, this new classification is yet to accommodate all known species and, for the time being, it is expedient to retain the genus *Caloplaca* as a place-holder for new taxa yet to be investigated phylogenetically.

Species of *Caloplaca* can occur on all substrates, including wood, bark, rock, soil and man-made materials. The genus is extremely widespread and is well-represented on all continents, including Antarctica. Its most prominent occurrence in the general landscape is probably at the coast, where it is responsible for the vivid orange, red or yellow banding of seashore rocks. However, the genus can also occur in extremely arid, inland areas, in woodlands and on the highest mountains.

Caloplaca is well-represented in the Tasmanian lichen flora. McCarthy (2013) lists 135 taxa in Australia and its oceanic islands, of which 43 occur in Tasmania, based mainly on the extensive revisionary studies of the Ukrainian lichenologist Sergey Kondratyuk and collaborators (Kärnefelt & Kondratyuk 2004; Kondratyuk *et al.* 2007a, 2007b, 2009a, 2009b, 2010, 2011, 2012; Lumbsch *et al.* 2011). The greatest concentration of species in Tasmania is probably on coastal rocks,

in dry sclerophyll woodlands where it occurs on soil, rocks and trees, and in inhabited, modified areas where many species colonise man-made substrates or can tolerate eutrophicated conditions. The occurrence of the genus in wetter habitats is comparatively rare. Very few species occur in wet sclerophyll forest [e.g. Kantvilas & Jarman (2012) recorded only three taxa, including the common *Blastenia circumpolaris* Søchting, Frödén & Arup (syn. *Caloplaca wilsonii* S.Y.Kondr. & Kärnefelt)], and only one, unnamed taxon has been recorded in rainforest (unpublished observations). It is likewise rare in alpine areas, although one species which is new to science has been collected occasionally from mosses overgrowing rocks. This remarkable species is described here.

Material and methods

The study is based on Tasmanian collections of the first author, housed in the Tasmanian Herbarium (HO), and a collection from southern New Zealand made by the second author. Descriptions are based on hand-cut sections of the thallus and ascomata examined at high-power with a light microscope. Mounting media included water, 15% KOH and lactophenol cotton blue after pretreatment with KOH. Measurements given in the description of apothecial tissues, asci and ascospores are based on mounts in water only. Measurements of ascospores are based on 100 observations and are presented in the form 5th percentile–average–95th percentile; outlying values are given in brackets.

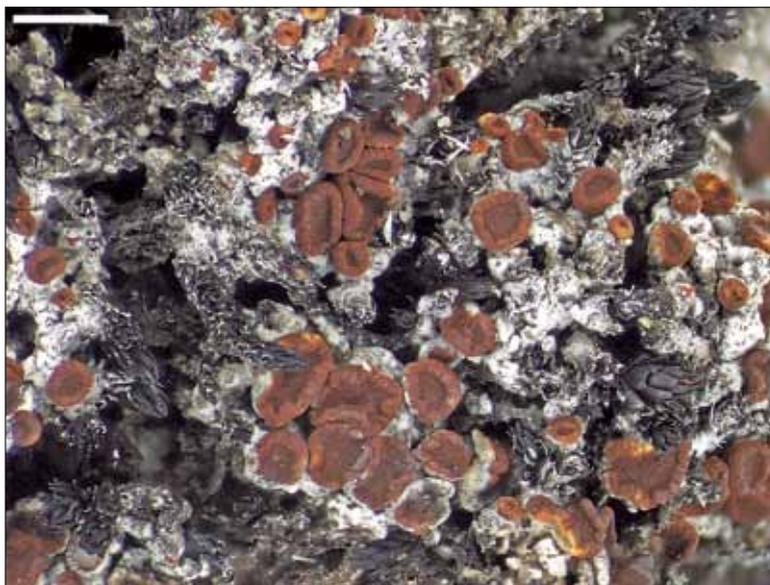


Fig. 1. *Caloplaca epibrya* habit (holotype); scale = 1 mm.

TAXONOMY

***Caloplaca epibrya* Kantvilas & Søchting sp. nov.**

Mycobank No. MB805211

Caloplacae nivali similis et item bryicola in montibus altis incolens sed ascosporis brevioribus latioribusque, 10–19 μm longis, 4–6.5 μm latis differens.

Type: Australia, Tasmania: Skullbone Plains, 42°02'S 146°19'E, 1000 m alt., amongst mosses on boulders in open heathland, 20 February 2012, G. Kantvilas 95/12 (HO–holotype; C–isotype).

Thallus crustose, effuse, whitish grey, undelimited, continuous to rather patchy, typically in small, irregular patches of just a few centimetres wide, rarely more

extensive and to 10 cm wide; prothallus absent; photobiont cells \pm globose to broadly ellipsoid, 12–26 \times 10–22 μm , arranged in irregular, discontinuous clumps beneath a rather amorphous “cortical” layer 20–40(–70) μm thick, composed of intertwined hyphae. *Apothecia* 0.4–1.4 mm wide, roundish, rarely a little deformed-lobate, scattered or crowded together, deep orange-red to orange, sometimes a little darkened and brownish, occasionally rusty reddish-pruinose, seemingly biatorine but usually with at least some development of pale grey, thalline tissue at the base, sometimes extending higher to envelope the entire apothecium, in section with outer parts interspersed with red-gold crystals that turn crimson and dissolve in KOH; disc concave at first, soon plane to undulate; exciple inrolled when young,

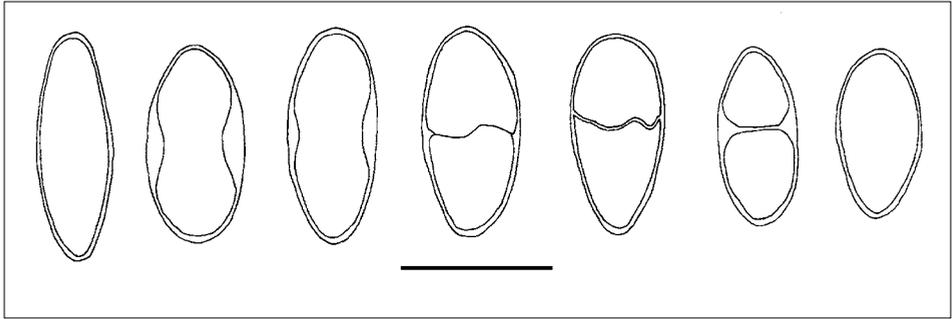


Fig. 2. *Caloplaca epibrya* ascospores (holotype). Scale = 10 μ m.

smooth or a little crenulate, persistent, in section consisting of two layers: an outer sclerenchymatous layer, 60–170 μ m thick, composed of dense, short-celled hyphae 4–6 μ m thick, containing algal cells mostly in scattered clusters; and an inner proper exciple, 15–30 μ m thick, of loosely entangled, long-celled hyphae 2–3 μ m thick. *Hypothecium* colourless, not interspersed, 50–130(–200) μ m thick. *Hymenium* colourless, not interspersed, 60–80 μ m thick; paraphyses sparsely branched, \pm uniformly 2–3 μ m thick, lacking swollen oil vacuoles, with apices only slightly expanded to 3–4 μ m; asci eight-spored, clavate, 50–62 \times 10–15 μ m. *Ascospores* narrowly ellipsoid, simple; unripe spores in asci often thinly 1-septate; ripe spores simple, but often with a slight equatorial thickening, (10–)11–13.6–16(–19) \times 4–5.4–6(–6.5) μ m. *Pycnidia* not found. *Chemistry*: emodin, emodic acid, emodin and citreorosein. (Figs 1 & 2)

Distribution and ecology

This is a relatively rare species, known from only a few collections in Tasmania,

all from alpine, dolerite peaks, and from an alpine meadow in New Zealand. It overgrows mosses (mostly species of *Andreaea*) on large boulders in exposed situations or in more sheltered microhabitats. Such boulders typically support very rich lichen communities, and species found associated with the new taxon in Tasmania include: *Catillaria contristans* (Nyl.) Zahlbr., *Lecanora lugubris* (C.W. Dodge) D.J. Galloway, *Menegazzia aeneofusca* (Müll. Arg.) R. Sant., *Ochrolechia androgyna* (Hoffm.) Arnold, *Pertusaria flavoexpansa* Kantvilas & Elix, *Poeltiaria coromandelica* (Zahlbr.) Rambold & Hertel, *Ramboldia petraeoides* (Nyl. ex C. Bab. & Mitt.) Kantvilas & Elix and two undescribed species of *Rimularia*, as well as various macrolichens such as species of *Xanthoparmelia* and *Umbilicaria*.

Additional specimens examined:

TASMANIA: Mt Eliza plateau, 42°58'S 146°24'E, 16.v.1971, G.C. Bratt & M.A. Cutliffe 71/815 (HO); Wombat Moor, 42°41'S 146°37'E, 1050 m alt., 13.x.1981, G. Kantvilas 762/81 (BM, HO); Skullbone

Plains, 42°02'S 146°21'E, 970 m alt., 21.xii.2012, G. Kantvilas 720/12 (HO).

NEW ZEALAND: South Island, Canterbury, Arthurs Pass, Temple Basin, 42.9084°S 171.5773°E, 1404 m alt., 9.ii.2012, U. Søchting 11957.1 (C).

Remarks

Even though ascospores in the Telo-schistaceae are generally polardiblastic (i.e. two-celled with a more-or-less thickened septum), simple or one-septate spores are known. Phylogenetic studies in the family have shown that the value of this character has been overrated. For example, the genus *Fulgensia* (now included in *Gyalolechia*), based on this character, has proved to be polyphyletic, and species with simple spores are also found in isolated species in the genera *Calogaya* (e.g. *C. schistidii*) and *Shackletonia* (*S. siphonospora*) (Arup *et al.* 2013). Preliminary molecular studies suggest that *C. epibrya* is not closely related to either of these groups, or to *C. nivalis* (Körb.) Th. Fr. or *C. tornöensis* H. Magn., two species that grow under very similar ecological conditions in the Northern Hemisphere (Hansen *et al.* 1987). Furthermore, *C. nivalis* differs from the new species by having significantly longer ascospores (27–32 x 4–5.5 µm) that are persistently simple, whereas *C. tornöensis* has broader ascospores (16–19 x 6–8 µm) with a well-developed but very thin septum (Hansen *et al.* 1987).

The apothecia of *C. epibrya* appear to be mostly biatorine in that their margin is concolorous with the disc. There is usually also some discernible development of grey

thalline tissue on their underside that can extend upwards and form an incomplete thalline margin. However, in section, algal cells are present even in red excipular tissue that is concolorous with the disc and not with the thallus. The proper exciple consists of a thin layer of long-celled, entangled hyphae wedged between the outermost layer of excipular tissue and the hymenial tissues.

The single New Zealand specimen corresponds to the Tasmanian type specimen in every detail, and even their ITS DNA sequences (to be reported elsewhere) are 100% identical.

Within the Tasmanian alpine lichen biota, *Caloplaca epibrya* is a small but conspicuous species. Other lichens with superficially similar, vivid red apothecia include *Ramboldia laeta* (Stirt.) Kalb, Lumbsch & Elix, but this species has glossy, waxy apothecia with an inconspicuous exciple, *Lecanora*-type asci, simple ascospores and it occurs directly on rock. There is also a superficially similar, very rare, and as yet unidentified species of *Caloplaca* in the Tasmanian highlands that occurs on rocks or mosses. It differs from the new species in having somewhat brownish, pruinose, unequivocally biatorine apothecia (i.e. lacking algal cells) and polardiblastic ascospores, 9–13(–15) x 5–7 µm, with a septum 2–4 µm thick. It has a chemical composition identical to *C. epibrya* and is somewhat similar to *C. ammiospila* (Wahlenb.) H. Olivier, which has apothecia with algal cells in the margin, and larger ascospores (13–18 x 6–9 µm, septum 4–6 µm)

Acknowledgements

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References

- Arup, U., Söchting, U. & Frödén, P. (2013). A new taxonomy of the family Teloschistaceae. *Nordic Journal of Botany* 31: 16–83.
- Gaya, E., Högnabba, F., Holguin, Á., Molnar, K., Fernández-Brime, S., Stenroos, S., Arup, U., Söchting, U., van den Boom, P., Lücking, R., Sipman, H.J.M. & Lutzoni, F. (2012). Implementing a cumulative supermatrix approach for a comprehensive phylogenetic study of the Teloschistales (Pezizomycotina, Ascomycota). *Molecular Phylogenetics and Evolution* 63: 374–387.
- Hansen, E.S., Poelt, J. & Söchting, U. (1987). Die Flechtengattung *Caloplaca* auf Grönland. *Meddelelser om Grønland Bioscience* 25: 1–52.
- Kantvilas, G. & Jarman, S.J. (2012). Lichens and bryophytes in Tasmanian wet eucalypt forest: floristics, conservation and ecology. *Phytotaxa* 59: 1–31.
- Kärnefelt, I. & Kondratyuk, S.Y. (2004). New species of *Caloplaca* (Teloschistaceae) from Australia. *Bibliotheca Lichenologica* 88: 255–265.
- Kondratyuk, S.Y., Kärnefelt, I., Elix, J.A. & Thell, A. (2007a). New species of the genus *Caloplaca* in Australia. *Bibliotheca Lichenologica* 95: 341–386.
- Kondratyuk, S.Y., Kärnefelt, I., Elix, J.A. & Thell, A. (2007b). Contributions to the Teloschistaceae of Australia. *Bibliotheca Lichenologica* 96: 157–174.
- Kondratyuk, S.Y., Kärnefelt, I., Elix, J.A. & Thell, A. (2009a). New *Caloplaca* species from Australia. *Bibliotheca Lichenologica* 99: 259–278.
- Kondratyuk, S.Y., Kärnefelt, I., Elix, J.A. & Thell, A. (2009b). Contributions to the Teloschistaceae, with particular reference to the Southern Hemisphere. *Bibliotheca Lichenologica* 100: 207–282.
- Kondratyuk, S.Y., Kärnefelt, I., Thell, A. & Elix, J.A. (2010). Six new species of *Caloplaca* (Teloschistaceae, Ascomycota) from Australasia. *Australasian Lichenology* 66: 30–43.
- Kondratyuk, S.Y., Elix, J.A., Kärnefelt, I. & Thell, A. (2011). Four new *Caloplaca* species with depsidones from Australia. *Bibliotheca Lichenologica* 106: 179–186.
- Kondratyuk, S.Y., Elix, J.A., Kärnefelt, I. & Thell, A. (2012). An artificial key to Australian *Caloplaca* species (Teloschistaceae, Ascomycota). *Bibliotheca Lichenologica* 108: 141–160.
- Lumbsch, H.T., Ahti, T., Altermann, S. *et al.* (100 others) (2011). One hundred new species of lichenized fungi: a signature of undiscovered global diversity. *Phytotaxa* 13: 1–137.
- McCarthy, P.M. (2013). *Checklist of the Lichens of Australia and its Island Territories*. Australian Biological Resources Study, Canberra. Version 29 June 2013. <http://www.anbg.gov.au/abrs/lichenlist/introduction.html>.

A NEW STATUS FOR *CLADONIA SULCATA*
(CLADONIACEAE), A COMMON AUSTRALIAN LICHEN,
WITH NOTES ON THE *C. CARIOSA* GROUP IN TASMANIA

Gintaras Kantvilas

Kantvilas, Gintaras, 2013. A new status for *Cladonia sulcata* (Cladoniaceae), a common Australian lichen, with notes on the *C. cariosa* group in Tasmania. Kanunna 6: 114–125. ISSN 1832-536X. *Cladonia sulcata* A.W. Archer is conspecific with *C. neozelandica* Vain., and the following new combinations are introduced to accommodate the four, chemically-defined varieties of the former: *C. neozelandica* Vain. var. *neozelandica*, containing atranorin and bourgeanic acid, *C. neozelandica* var. *sulcata* (A.W. Archer) Kantvilas with additional psoromic acid, *C. neozelandica* var. *striata* (A.W. Archer) Kantvilas with additional norstictic acid, and *C. neozelandica* var. *wilsonii* (A.W. Archer) Kantvilas, with additional stictic acid. *Cladonia neozelandica* var. *lewis-smithii* Ahti, Elix & Øvstedal and *C. sulcata* var. *depleta* Kantvilas & Elix are synonyms of *C. neozelandica* var. *neozelandica*. Two new varieties of *C. enantia* Nyl., characterised by their unusual chemical composition, are described: *C. enantia* var. *adiecta* Kantvilas (with homosekikaic acid) and *C. enantia* var. *brattii* Kantvilas (with bourgeanic acid). The status of the related species, *C. tessellata* Ahti & Kashiw., based on a South American type, is discussed; all Tasmanian specimens of this species are here included within *C. enantia*. *Cladonia polycarpoides* Nyl. is recorded for Tasmania for the first time.

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KEY WORDS: biodiversity, bourgeanic acid, *Cladonia* section *Helopodium*, new taxa

Introduction

Cladonia sulcata A.W. Archer is a widespread Australasian lichen belonging to what is frequently referred to as the *C. cariosa* (Ach.) Spreng. group, or *Cladonia* sect. *Helopodium* (Ach.) Stenroos (Archer 1992). This complex of species is characterised by typically prominent and persistent basal squamules and longitudinally grooved and split, escyphose, esorediate podetia with terminal, brown apothecia. *Cladonia sulcata* has a very characteristic chemical composition comprising atranorin and the aliphatic (fatty) acid, bourgeanic acid, frequently occurring together with a range of depsidones. It is further characterised by having relatively small apothecia, mostly < 0.8 mm wide. The species was first described by Archer (1982) who recorded the presence of psoromic acid. Subsequently other chemical races were recognised at varietal rank: *C. sulcata* var. *wilsonii* (A.W. Archer) A.W. Archer with stictic acid (Archer 1984; Archer & Bartlett 1986), *C. sulcata* var. *striata* A.W. Archer with norstictic acid (Archer 1987) and *C. sulcata* var. *depleta* Elix & Kantvilas, which lacks depsidones (Elix & Kantvilas 1995). A further member of the *C. cariosa* group, *C. neozelandica* Vain., has also been recorded for Australia (Tasmania) (Kantvilas & Elix 1992). A recent examination of the type specimen of this taxon revealed that it is conspecific with *C. sulcata* and the necessary nomenclatural changes are introduced in this paper. In addition, other members of the *C. cariosa* group in Tasmania are discussed and two further infra-specific taxa are described for the first time.

Material and methods

The study is based on collections, mainly from Tasmania, housed in the Tasmanian Herbarium (HO), on reference material held in the Natural History Museum, London (BM), and on examination of relevant type specimens, mostly from the Australian National Herbarium (CANB), the Finnish Museum of Natural History (H) and the National Herbarium of Victoria (MEL). Chemical composition was determined by thin-layer chromatography (t.l.c.) using standard methods (Orange *et al.* 2001); solvent A was the preferred medium. The chemistry of the type specimen of *C. neozelandica* was confirmed by Prof. J. Elix, Canberra, using high-performance liquid chromatography (Elix *et al.* 2003).

Detection of bourgeanic acid: This compound is not visible under U.V. light or on 'developed' t.l.c. plates (i.e. plates that have been treated with sulphuric acid and charred). To detect it, plates can be wetted with acid (by painting the acid onto the plate using a glazing brush) and allowed to air dry for a few minutes. Bourgeanic acid appears high on the plate as a large, ghost-like colourless spot with a white rim. A second technique involves a simple microcrystal test. A fragment of the lichen thallus is extracted on a microscope slide by repeatedly adding drops of acetone and allowing them to evaporate. This procedure leaves a rim of whitish residue on the slide. Discard the lichen fragments and examine the whitish extract at x100 magnification: bourgeanic acid appears as long feathery crystals. This second method is quicker and cheaper than t.l.c., but care needs to be taken that the lichen has been extracted for a sufficiently long time (about 6–10 drops of acetone).

TAXONOMY

1. *Cladonia neozelandica* Vain. var. *neozelandica*

Acta Soc. Faun. Fl. fenn. 10: 34 (1894).

Type: New Zealand, *Charles Knight*, ex herb. Vainio 17286 (holo: TUR 18603!).

Cladonia sulcata var. *depleta* Elix & Kantvilas, *Pap. Proc. R. Soc. Tasm.* 129: 64 (1995). Type: Australia, Tasmania, Arthur-Pieman Protected Area, 32 km NNE of Savage River, along the Pipeline Road, 41°16'S 145°19'E, 480 m elevation, on soil along margin of rainforest, 8 December 1993, *J.A. Elix 40118 & G. Kantvilas* (holo: HO 312449!; iso: CANB).

Cladonia neozelandica var. *lewis-smithii* Ahti, Elix & Øvstedal, *Bibliotheca Lichenologica* 95: 132 (2007). Type: Falkland Islands (Islas Malvinas): East Falklands, Saunders Island, east-facing slope of Mt Egmont, above Sealers Cove, alt. 20 m, 24 January 2000, *R.L. Lewis Smith 11007* (holo: AAS; iso: H).

Basal squamules very prominent and persistent, erect or ascending, often entangled, 2–10(–15) mm long, 1–3.5 mm wide, with a smooth, greyish green cortex, sometimes in part discoloured brownish. *Podetia* escyphose, 10–50 mm tall, greyish or greenish white with a continuous or areolate cortex, longitudinally furrowed and split, highly branched. *Apothecia* brown, 0.3–0.8 mm wide. Full descriptions are provided by Vainio (1894), Galloway (1985), Elix & Kantvilas (1995) (as *C. sulcata* var. *depleta*) and Ahti *et al.* (2007) (as var. *lewis-smithii*). (Figs 1A–C)

Chemistry: atranorin and bourgeanic acid, ± traces of other fatty acids; thallus K+ weak yellow, KC–, C–, P–.

Distribution: Tasmania, Macquarie Island, New Zealand, Falkland Islands.

Remarks

Several published accounts of *C. neozelandica* state that its chemical composition comprises atranorin only (e.g. Archer & Bartlett 1986; Kantvilas & Elix 1992), and this chemistry is indicated on some duplicate herbarium specimens distributed by the National Herbarium of New South Wales (NSW). Galloway (1985) mentions atranorin, norstictic acid, zeorin and unidentified compounds; the presence of norstictic acid suggests that his concept of the species includes var. *striata* (see below). More recently, Ahti *et al.* (2007) also stated that the type specimen contained atranorin and norstictic acid. Bourgeanic acid has been overlooked by these authors, possibly because it requires a modified approach to be detected. My own investigations indicate that the type specimen contains atranorin, bourgeanic acid and traces of two additional fatty acids, homoheviadrone and heviadrone (analyses confirmed by J.A. Elix, Canberra). Two Tasmanian specimens also contain minute traces of lobaric and fumarprotocetracic acid, but these additional compounds are probably contaminants from other lichens with which they grow.

Cladonia neozelandica var. *neozelandica* is common and widespread in Tasmania where it has been recorded from a wide variety of vegetation types including the margins of cool temperate rainforest, sclerophyll forests and heathlands,

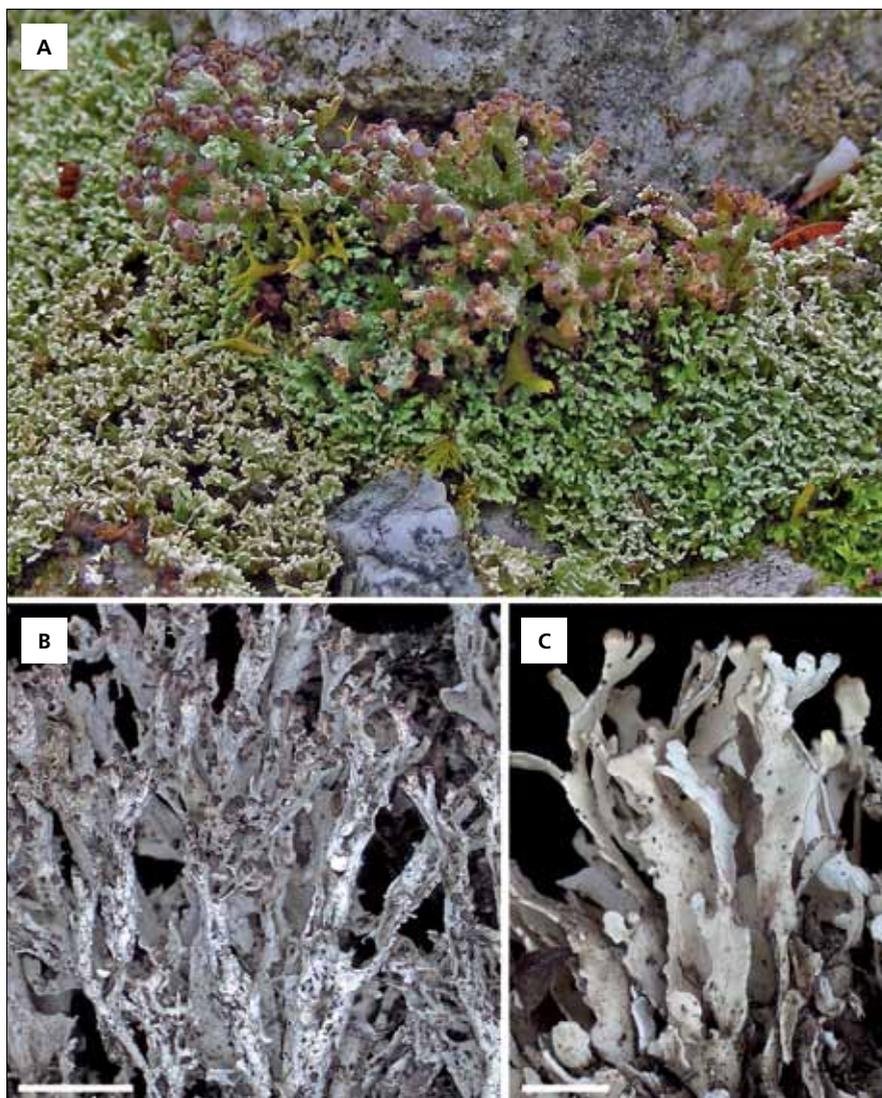


Fig. 1. *Cladonia neozelandica* var. *neozelandica*.

- A.** Habit of a typical whole thallus with basal squamules dominant and forming a mat from which arise fertile podetia.
- B.** Upper part of podetia showing dense branching pattern, longitudinal furrows and tears, and small brown terminal apothecia (*Kanvilas 300/02*); scale = 5 mm.
- C.** Details of basal squamules in a specimen from a sheltered moist site; in drier habitats the squamules become shorter, more ragged and crowded (*Kanvilas 257/93 & Elix*); scale = 3 mm.

ranging from lowland to alpine elevations. It is often a coloniser of recently disturbed soil along roads and tracks. Thalli with the largest, most loosely entangled squamules occur in moister, cooler or more sheltered habitats, whereas those from drier, exposed sites are invariably shorter and more compact. The species is most commonly observed as extensive swards of basal squamules lacking podetia. Such thalli may be mistaken for a *Siphula* species although they differ clearly from any *Siphula* by having dorsiventral squamules with a greenish to discoloured brownish upper surface and white undersurface, lacking rhizines and having the diagnostic chemical composition described above.

Selected specimens examined:

TASMANIA: Flinders Island, mountain W of Palana, 39°46'S 147°52'E, 1965, *R. Filson 7089* (HO); 6 km S of Gladstone, 40°59'S 148°00'E, 100 m alt., 1969, *G.C. Bratt & J.A. Cashin 69/986* (HO); Prosser River, 42°34'S 147°52'E, 1980, *G. Kantvilas 313/80* (BM, HO); Pencil Pine Creek, 41°37'S 145°54'E, 900 m alt., 1983, *A. W. Archer 1541A* (HO, NSW); Lake Dobson, 42°41'S 146°35'E, 1030 m alt., 1993, *G. Kantvilas 257/93 & J.A. Elix* (HO); Savage River Pipeline Road, 41°16'S 145°19'E, 480 m alt., 1993, *G. Kantvilas 258/93 & J.A. Elix* (HO; distributed as *A. Vezda: Lich. Rar. Exsicc.* 477); western slopes of Mt Dromedary, 42°43'S 147°07'E, 800 m alt., 2002, *G. Kantvilas 300/02* (HO); summit area of Mt Cuvier, 42°02'S 146°02'E, 1350 m alt., 2005, *G. Kantvilas 74/05* (HO); c. 2 km W of Pine Cove Beach, 42°44'S 147°52'E, c. 100 m alt., 2013, *G. Kantvilas 173/13* (HO).
MACQUARIE ISLAND: NNE of Island Lake, 54°30'S 158°57'E, 200 m alt., 1995, *R.D. Seppelt 19493* (HO).

2. *Cladonia neozelandica* var. *striata* (A.W. Archer) Kantvilas, comb. nov.

Mycobank No.: MB805206

Basionym: *C. sulcata* var. *striata* A.W. Archer, *Muelleria* 6: 386 (1987). Type: Australia, New South Wales, near First Rocks, Mona Vale Road, 18 km NNW of Sydney, 151°10'E, 33°42'S, altitude c. 150 m, 14.iv.1984, *A.W. Archer 1667* (holo: MEL 1047761!; iso: CANB!, H, NSW).

Chemistry: atranorin, bourgeanic acid, norstictic acid and connorstictic acid (minor), ± traces of stictic, cryptostictic and constictic acids; thallus K+ weak yellow, KC-, C-, P+ weak yellow.

Distribution: southern mainland Australia, Tasmania, New Zealand.

Remarks

Distinguished from the main variety solely by the presence of norstictic acid as a major compound, although this substance also occurs in variety *wilsonii* in trace concentrations. *Cladonia neozelandica* var. *striata* occurs on soil in dry sclerophyll vegetation (Archer 1987). Because of its generally drier, more exposed habitat, it often has rather smaller basal squamules and shorter, sometimes more densely squamulose podetia than does variety *neozelandica*, although the two varieties overlap morphologically. Most Tasmanian specimens comprise a mat of basal squamules only and have been collected in coastal heathland, typically on consolidated sand.

Specimens examined:

TASMANIA: Cape Barren Island, NE of Stanley Hill, 40°24'S 148°00'E, 40 m alt., 1976, J.S. Whinray 899 (HO, MEL); Tomahawk Point, 40°52'S 147°45'E, 20 m alt., 2003, G. Kantvilas 110/03B (HO); Fishers Point, 43°35'S 146°55'E, 1 m alt., 2004, G. Kantvilas 74/04 (HO); Cape Pillar Track, Tornado Flat, 43°12'S 147°57'E, 240 m alt., 2005, G. Kantvilas 269/05 (HO); Kimberley, at old crossing over Mersey River, 41°24'S 146°29'E, 50 m alt., 2006, G. Kantvilas 111/06 (HO); Flinders Island, mouth of North-East River, 39°44'S 147°57'E, 2 m alt., 2007, G. Kantvilas 95/07 (HO).

3. *Cladonia neozelandica* var. *sulcata* (A.W. Archer) Kantvilas, comb. and stat. nov.

Mycobank No.: MB805207

Basionym: *Cladonia sulcata* A.W. Archer, *Muelleria* 5: 115 (1982). Type: Australia, Victoria, 8 km E of Tawonga, on soil by side of Trappers Creek Road, c. 147°15' 36°41'S, altitude c. 700 m, 22.xi.1979, A.W. Archer 803 (holo: MEL 1031486!; iso: H, COLO).

Chemistry: atranorin, bourgeanic acid, psoromic acid and consporomic acid (minor); thallus K⁺ weak yellow, KC⁻, C⁻, P⁺ vivid yellow.

Distribution: south-eastern mainland Australia, Tasmania and New Zealand.

Remarks

Distinguished from the main variety solely by the presence of psoromic acid. This is a relatively uncommon compound in the

genus *Cladonia* in southern Australia. It occurs (also together with atranorin) in *Cladonia praetermissa* var. *modesta* (Ahti & Krog) Kantvilas & A.W. Archer but that species lacks bourgeanic acid and has cylindrical, simple podetia that are sorediate at the apices. Psoromic acid is also found in *C. staufferi* Abbayes, a species that lacks atranorin and bourgeanic acid, belongs to the *C. cervicornis* group and is restricted to alpine habitats. *Cladonia neozelandica* var. *sulcata* appears to be uncommon but widely scattered in Tasmania, occurring on soil in wet sclerophyll forest; since the specimens cited by Archer (1982), it has been collected at only one further locality.

Specimen examined:

TASMANIA: track to Tatnells Hill, 43°04'S 147°57'E, 400 m alt., 2002, G. Kantvilas 295/02 (HO).

4. *Cladonia neozelandica* var. *wilsonii* (A.W. Archer) Kantvilas comb. nov.

Mycobank No. MB805208

Basionym: *Cladonia wilsonii* A.W. Archer, *Muelleria* 5: 274 (1984); *C. sulcata* var. *wilsonii* (A.W. Archer) A.W. Archer, *New Zealand J. Bot.* 24: 583 (1986). Type: Australia, A.C.T., on soil by side of Corin Dam Rd., near Kangaroo Creek, altitude c. 1000 m, 2.v.1982, A.W. Archer 1315C (holo: MEL!; iso: H, NSW).

Chemistry: atranorin, bourgeanic acid and stictic acid, ± traces of norstictic, cryptostictic and constictic acids; thallus K⁺ weak yellow, KC⁻, C⁻, P⁺ weak yellow.

Distribution: southern mainland Australia, Tasmania, New Zealand and Macquarie Island.

Remarks

Distinguished from the main variety solely by the presence of stictic acid as a major chemical component; chemically similar to var. *striata* in which stictic acid occurs only in trace concentrations and norstictic acid is major. However, these two varieties have rather disjunct Australasian distributions, with var. *striata* occurring in drier areas whereas var. *wilsonii* is found in moister, cooler areas. See Archer (1984) for further descriptive data.

In Tasmania, *C. neozelandica* var. *wilsonii* is common and widespread, occurring on soil, peat and, more rarely, on rotting wood. It ranges from lowland to highland elevations in wet heathland, wet sclerophyll forest and at the margins of cool temperate rainforest. It is the most common variety of *C. neozelandica* present, accounting for c. 56% of specimens studied, in comparison to 34% for var. *neozelandica*, 7% for var. *striata* and 3% for var. *sulcata*. Although most specimens seen consist mainly of basal squamules, thalli with at least a few fertile podetia are not infrequent.

Selected specimens examined:

TASMANIA: track to Beatties Tarn, 42°41'S 146°39'E, 920 m alt., 1963, G.C. Bratt & J.A. Cashin 431 (HO); Mt Wellington, Pipeline Track, 42°56'S 147°13'E, 1980, A.V. Ratkowsky L132 (BM, HO); Lake Dobson, 42°41'S 146°35'E, 1030 m alt., 1981, G. Kantvilas 640/81 & P. James (BM, HO); Little Fisher River, 41°45'S 146°20'E, 950 m alt., 1982, G. Kantvilas 281/82 (HO); Mt

Wellington, Shoobridge Track, 42°54'S 147°15'E, 500 m alt., 1982, A.W. Archer 1409 (HO, NSW); Broad River, c. 2 km below Lake Webster, 42°38'S 146°35'E, 820 m alt., 1986, G. Kantvilas 2/86 (HO); summit of Mt Wedge, 42°51'S 146°18'E, 1145 m alt., 2002, G. Kantvilas 616/02 (HO); Bruny Island, track to Mt Mangana, 43°22'S 147°17'E, 500 m alt., 2003, G. Kantvilas 491/03 (HO, STU).

MACQUARIE ISLAND: SW side of Green Gorge Basin, 54°38'S 158°54'E, 85 m alt., 1979, R.D. Seppelt 6867 (HO); Boot Hill, 54°31'S 158°55'E, 1985, R.D. Seppelt s.n. (HO 52823).

5. *Cladonia enantia* Nyl. var. *enantia*

In W. von Zwack-Holzhausen, *Rev.*

Cladonia: 1 (1888).

Type: New Zealand, [probably Wellington], 1867, C. Knight 204 (lecto, *vide* Galloway 1985: H-NYL 38740!).

Cladonia tessellata auct. non Ahti & Kashiw., in Inoue, *Studies Crypt. S. Chile*: 145 (1984). (Tasmanian records)

Basal squamules prominent and persistent, 1–2 mm wide, 2–5 mm long, crowded together in a mat, with upturned edges displaying the white undersurface; cortex smooth, greyish green. *Podetia* 5–40(–55) mm tall, 1.5–2 mm thick, simple or branched (mostly 1–3 times) near the apex and ± forming a corymb, with open axils and longitudinal striations and tears, especially in the upper part, ± entire in the lower part; cortex smooth and continuous, or, more commonly, composed of contiguous or dispersed corticate plates or warts; squamules also sometimes present



Fig. 2. *Cladonia enantia* var. *enantia*. Habit (Kantvilas 633/03); scale = 5 mm.

near the base. *Apothecia* brown, 0.5–1 mm wide, frequently fused together in \pm cerebriform clusters to 4 mm wide. For full descriptions, see Archer (1992) and Galloway (1985). (Fig. 2) *Chemistry*: fumarprotocetraric acid; podetia K–, KC–, C–, P+ red.

Distribution: Tasmania, mainland Australia, New Zealand.

Remarks

The names *C. enantia* and *C. tessellata* Ahti & Kashiw., the latter being a related South American species based on a type

from Chile (Ahti & Kashiwadani 1984; Ahti 2000), have both been applied in a Tasmanian and Australian context by Archer (1992) and subsequent workers. However, after extensive study of specimens (including types) from Tasmania and elsewhere, I have concluded that there is but one species present in Tasmania and that the correct name to apply is *C. enantia*. The supposed distinction between it and *C. tessellata* (relating to the presence or absence of longitudinal splits) is not consistent in the large number of specimens studied. The type specimen of *C. enantia* has relatively

large basal squamules, podetia with prominent splits and tears, a chinky, scaly cortex and some squamules at the base. It matches the taxon found in Tasmania perfectly, both morphologically and chemically. In contrast, the type specimen of *C. tessellata* and other South American specimens (examined in BM) all contain fumarprotocetraric acid together with atranorin, a substance not found in any of the Tasmanian specimens.

Two chemical variants of *C. enantia*, containing bourgeanic and homosekikaic acids respectively, are treated below at varietal rank.

Cladonia enantia var. *enantia* is widespread and very common in Tasmania on loam or clay soils, less commonly on peat or humus, especially on disturbed ground on roadsides, at the margins of forest, on soil on uprooted trees, and in rough grazing land. All collections are from low to subalpine elevations.

Selected specimens examined:

TASMANIA: Pine Tier Dam, 42°06'S 146°29'E, 1964, *G.C. Bratt 1547* (HO); Heemskirk River, 41°49'S 145°13'E, 120 m alt., 1974, *G.C. Bratt 74/16* (HO); track by side of Cuvier River, 42°05'S 146°07'E, 840 m alt., *A.W. Archer 1562* (H, HO); Mt Wellington near Sphinx Rock, 42°55'S 147°15'E, 1981, *A.V. Ratkowsky L140* (BM, HO); road to Laughing Jack Lagoon, 42°10'S 146°22'E, 700 m alt., 1984, *G. Kantvilas 65/84* (HO, NSW); Cape Raoul Track, 43°13'S 147°47'E, 230 m alt., 2003, *G. Kantvilas 633/03* (HO); Florentine Bridge, 42°30'S 146°27'E, 350 m alt., 2005, *G. Kantvilas 295/05* (HO, KR); summit of The Sheppards Hill, 43°06'S 147°16'E, 240 m alt., 2005, *G. Kantvilas 120/05* (HO).

6. *Cladonia enantia* Nyl. var. *adiecta* Kantvilas var. nov.

Mycobank No. MB805209

A varietate principali acidum homosekikaicum adiectum continenti statim dignoscenda.

Type: Australia, Tasmania: c. 5 km SW of Catamaran, 43°35'S 146°50'E, 50 m alt., on roadside soil in wet sclerophyll forest, 21 February 1990, *G. Kantvilas 35/90* (holo: HO 122383).

Characterised by having prominent, ascending basal squamules and podetia 25–40 mm tall, branched 3–5 times, with a cortex of contiguous or slightly separate plates and scales. Morphologically it is identical with *C. enantia* var. *enantia*, from which it differs by the presence of homosekikaic acid in addition to fumarprotocetraric acid (podetia K–, KC–, C–, P+ red). (Fig. 3B)

Homosekikaic acid is an occasional metabolite in Tasmanian *Cladoniae*. Together with fumarprotocetraric acid, it is found in two scyphose species, *C. calyciformis* Nuno and *C. novochlorophaea* (Sipman) Brodo & Ahti, and in *C. adspersa* Mont. & Bosch, a species with squamulose, granular and/or sorediate podetia with small scyphi. It also occurs, together with thamnolic acid, in *C. rigida* var. *acuta* (Taylor) A.W. Archer. The two available specimens of this new variety suggest that it is uncommon and, like variety *enantia*, occurs mainly in the lowlands on rather disturbed soil such as along roadsides or at the margins of rough grazing ground.

Etymology: the epithet 'adiecta' (meaning 'added' in Latin) refers to the presence of additional homosekikaic acid by which this taxon is characterised.

Additional specimen examined:

TASMANIA: Cape Contrariety, 43°01'S 147°31'E, 50 m alt., 2003, G. Kantvilas 478/03 (HO).

7. *Cladonia enantia* Nyl. var. *brattii* Kantvilas

Mycobank No. MB805210

A varietate principali acidum bourgeanicum adiectum continenti statim dignoscenda.

Type: Australia, Tasmania: Tanina, c. 14 km N of New Norfolk, 42°38'S 147°01'E, 480 m alt., on sandstone, 21 June 1970, G.C. Bratt & J.A. Cashin 70/757 (holo: HO 53111).

Morphologically this variety falls within the range of variation displayed by var. *enantia* and var. *adiecta*, from which it differs by its chemical composition of bourgeanic acid in addition to fumarprotocetraric acid (podetia K-, KC-, C-, P+ red). Owing to its more exposed habitat, the podetia of the type specimen are relatively short (<7 mm). The second specimen consists of basal squamules only. (Fig. 3A)

This combination of metabolites is unusual in Tasmanian *Cladoniae*. It is also found in the scyphose taxon, *C. humilis* var. *bourgeanica* A.W. Archer, and in *C. paeminosa* A.W. Archer, a species with richly branched, acute podetia with peeling squamules and minute corticate granules



Fig. 3. New varieties of *Cladonia enantia*

A. *C. enantia* var. *brattii* habit (holotype); scale = 3 mm.

B. *C. enantia* var. *adiecta* habit (holotype), showing characteristic corymbose podetia with longitudinal striations and tears; scale = 5 mm.

Etymology: the epithet commemorates the Tasmanian lichenologist, Geoff Bratt, who collected the type specimen and many other interesting lichens.

Additional specimen examined:

TASMANIA: Bruny Island, Coal Point, 43°20'S 147°19'E, 3 m alt., 2005, *G. Kantvilas* 144/05 (HO).

8. *Cladonia polycarpoides* Nyl.

In W. Zwack-Holzhausen, *Lich. Exsicc.* 626, 626bis (1892).

Basal squamules prominent and persistent, 1–2 mm wide, to 3 mm long. *Podetia* not seen in Tasmanian material, 4–10 mm tall, 0.5–1 mm wide, simple or, more rarely, branched 1–4 times, with a ± continuous cortex, lacking squamules. *Apothecia* brown, 0.5–1 mm wide. For a full description, see Archer (1992) and Ahti (2000, as *C. subcariosa* Nyl.). *Chemistry:* norstictic acid, connorstictic acid (trace) and homohevedride.

This species is very widely distributed and has been recorded for mainland Australia, New Zealand, Eurasia and the Americas (Ahti 2000). This is the first record for Tasmania. As noted by Archer (1992), *C. polycarpoides* is an uncommon species in Australia where it occurs mostly as basal squamules only. However, its chemical composition is diagnostic (Archer & Taylor 1987). The single Tasmanian specimen was collected from basalt soil in degraded native grassland, growing together with *Xanthoparmelia amphixantha* (Müll. Arg.) Hale, *X. flavescens* (Gyeln.) D.J. Galloway and *X. molliuscula* (Ach.) Hale. The site has since been developed for housing.

Specimen examined:

TASMANIA: Jordan Property, Ford Road, 42°42'S 147°16'E, 55 m alt., 2004, *G. Kantvilas* 134/04 (HO).

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References

- Ahti, T. (2000). Cladoniaceae, *Flora Neotropica Monograph* 78: 1–362.
- Ahti, T. & Kashiwadani, H. (1984) The lichen genera *Cladia*, *Cladina* and *Cladonia* in southern Chile. In: *Studies on Cryptogams in Southern Chile* (H. Inoue, ed.): 125–151. Kenseisha, Tokyo.
- Ahti, T., Elix, J.A. & Øvstedal, D.O. (2007) A new *Cladonia* from the Falkland Islands (Islas Malvinas) and New Zealand, *Bibliotheca Lichenologica* 95: 131–135.
- Archer, A.W. (1982) A new Australian lichen: *Cladonia sulcata*, *Muelleria* 5: 115–117.
- Archer, A.W. (1984) Three new Australian lichens: *Cladonia celata*, *C. praetermissa* and *C. wilsonii*. *Muelleria* 5: 271–275.
- Archer, A.W. (1987) Two new lichens: *Cladonia squamosula* var. *subsquamosula* and *C. sulcata* var. *striata* with notes on chemotaxonomy within the species, *Muelleria* 6: 383–388.
- Archer, A.W. (1992) Cladoniaceae, *Flora of Australia* 54: 107–152.
- Archer, A.W. & Bartlett, J.K. (1986) New species and distributions of the lichen genus *Cladonia* in New Zealand together with a revised key, *New Zealand Journal of Botany* 24: 581–587.
- Archer, A.W. & Taylor, W.C. (1987) Homoheveadrinde, a novel cyclononadiene bis-anhydride from *Cladonia polycarpoides*. *Phytochemistry* 26: 2117–2119.
- Elix, J.A. & Kantvilas, G. (1995) New taxa and new records from the Tasmanian lichen flora. *Papers and Proceedings of the Royal Society of Tasmania* 129: 63–68.
- Elix, J.A., Giral, M. & Wardlaw, J.H. (2003) New chloro-depsides from the lichen *Dimelaena radiata*, *Bibliotheca Lichenologica* 86: 1–7.
- Galloway, D.J. (1985) *Flora of New Zealand Lichens*, P. Hasselberg, Govt. Printer, Wellington
- Kantvilas, G. & Elix, J.A. New species and new records from the Tasmanian lichen flora, *Muelleria* 7: 507–517. (1992)
- Orange, A., James, P.W. & White, F.J. (2001) *Microchemical Methods for the Identification of Lichens*, London, British Lichen Society.
- Vainio, E.A. (1894) Monographia *Cladoniarum universalis*, *Acta Societatis pro Fauna et Flora Fennica* 10: 1–498.

THE TASMANIAN FOREST INSECT COLLECTION AND ITS TRANSFER TO TMAG

Simon Grove and Dick Bashford

Grove, S. and Bashford, D. 2013. The Tasmanian Forest Insect Collection and its transfer to TMAG. *Kanunnah 6*: 126–144. ISSN 1832-536X. Forty years ago, the Tasmanian Forestry Commission appointed its first forest entomologist. Thus was born the Commission's working reference collection of insects, later named the Tasmanian Forest Insect Collection (TFIC). Following the Commission's 1994 corporatisation, the collection passed into the care of Forestry Tasmania. The new forestry model that emerged following the 1997 Tasmanian Regional Forest Agreement (TFA) demanded an expansion of insect-related research. By early 2013, with over 90% of the accessions databased, the TFIC comprised close to 227 000 databased, dry-mounted specimens, belonging to at least 2450 species of insects. Despite the best efforts of the entomologists associated with the TFIC, fewer than 1000 of these species bear full species binomials, reflecting the vast number of poorly known taxa in Tasmania, most of which are still to be formally described. With the recent upheavals in the forestry sector and the resultant role-change for Forestry Tasmania, the TFIC was in need of a new home. Through a long-standing arrangement, the collection is being re-housed at TMAG's Collections and Research facility. Merging the TFIC with TMAG's existing insect collections will further enhance the long-term scientific value of this outstanding collection of Tasmanian forest insects, and will foster its use for taxonomic research.

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KEY WORDS: insects, beetles, Coleoptera, Tasmania, Tasmanian Forest Insect
Collection

Introduction

Forestry in Tasmania, as elsewhere, depends for its ecological sustainability and long-term productivity on developing a meaningful level of understanding of the forests in which it operates. For this reason, scientific research has long been viewed as an important endeavour by Tasmania's public forest managers. Insects are a dominant life-form in forests – important for their ecology and sometimes their pest potential. Accordingly, forest insects have been the subject of extensive research. The Forestry Commission appointed its first forest entomologist in 1974, and soon afterwards established an insect collection, to serve as a reference for its in-house program of applied research on Tasmanian forest insect pests and their associated parasites and predators. Since that time, the collection – now named the Tasmanian Forest Insect Collection (TFIC) – has expanded greatly, in line with a broadening of its role to encompass forest ecology, biodiversity and quarantine matters. It currently comprises close to 227 000 databased, dry-mounted specimens, belonging to at least 2450 species of insects, derived from studies by staff and students at Forestry Tasmania, the University of Tasmania and a range of other institutions. This paper (a) charts the development of the TFIC, (b) reports on its current status, and (c) outlines future management pathways in view of its transfer from Forestry Tasmania to the Tasmanian Museum and Art Gallery. Many of the scientific publications arising from the entomological research associated with the TFIC are listed in the Appendix.

Development of the Tasmanian Forest Insect Collection: the early years

The TFIC began its life in 1974 as a small insect collection occupying a series of wooden boxes at CSIRO's Sirex Unit at Llanherne, near Hobart Airport, where the Forestry Commission's new forest entomologist, Humphrey Elliott, was initially based. One of us (DB) joined the Commission shortly after as entomological technician. In accordance with the forest-health priorities of the day, the collection's initial purpose was to aid in the identification of insect pests of commercial plantings and wood products – not only *Sirex* wood-wasp (a major pest of pines) but also various leaf-feeders, sap-feeders and wood-borers. During these early years the Commission's entomologists initiated a long-term study of insects in Tasmania's east coast native forests, in response to the initiation of export wood-chipping in the region. This resulted in many non-pest insect specimens being added to the collection for the first time.

At first, for identification most specimens were taken to the Tasmanian Department of Agriculture's New Town laboratories, or sent to CSIRO's Australian National Insect Collection in Canberra. This proved less necessary as the collection encompassed more and more identified material. By the time the Commission moved from Hobart's Murray Street to new offices in Macquarie Street in 1979 (Fig. 1), the collection had expanded to incorporate not only the insect pests but also their associated insect parasitoids and predators which had become a focus of the Commission's entomological research. At this stage the collection had outgrown



Fig. 1. At work in the mid-1970s, during the early years of the Tasmanian Forest Insect Collection.
A. Dick Bashford. **B.** Humphrey Elliott.

its original boxes and was transferred to a purpose-built ten drawer cabinet, which itself was augmented by another cabinet of *Sirex*-related specimens transferred from CSIRO's holdings at Llanherne. In 1985, the Commission published *Insect pests of trees and timber in Tasmania* (Elliott and deLittle, 1985), relying heavily on the collection for reference material.

The facility at Llanherne had also allowed for the rearing of wood-borers (primarily the larvae of beetles and moths) through to adulthood. Many of the specimens in the collection dating from this period are of borers and include their host-plant records. Eventually, these records were published by the Commission in a 1990 booklet, *Tasmanian forest insects and their host plants: records from the Tasmanian Forestry Commission insect collection* (Bashford, 1990).

The collection's remit broadens

As the 1980s progressed, environmental matters rose to the fore. The 1985 Tasmanian *Forest Practices Act* introduced various planning and regulatory mechanisms, aimed at promoting better environmental outcomes in production forestry. Assessing or monitoring the effectiveness of these mechanisms required on-going research. Rob Taylor, employed as the Commission's zoologist, initiated and oversaw a number of research programmes that involved using insects as study-tools; for instance, to examine the effectiveness of wildlife habitat strips as a conservation measure in production-forest landscapes. These studies contributed to, and made increasing use of, the insect collection. In 1988, the Commonwealth Government initiated the National



Fig. 2. Sampling rainforest insects.

- A.** A tent to exclude wood-borer colonisers of myrtle during a study investigating the spread of myrtle wilt.
- B.** George Ettershank using a 'pooter' to sample insects visiting leatherwood flowers.

Rainforest Conservation Program which funded research aimed at identifying and conserving Australia's rainforests. In Tasmania, this included several insect biodiversity sampling studies (Fig. 2), with the resultant accumulated specimens further expanding the collection.

In 1990 Dick Bashford, manager of Forestry Tasmania's insect collection, was a founder member of the Council of Heads of Entomological Collections (CHAEC), an expert group charged with raising awareness of the importance of Australia's entomological collections and of insect systematics research based upon them. The acronym TFIC (Tasmanian Forest Insect Collection) was devised as a standard means of referring to the

collection in 1992, and now appears in the official on-line list of insect and spider collections of the world (<http://hbs.bishopmuseum.org/codens/codens-inst.html>). The founding of CHAEC was followed, in 1993, by the establishment of a subsidiary council in Tasmania, whose early focus was to seek fuller legislative protection for several of the State's insect collections. As a result of the work of this council a memorandum of understanding was signed in 1995 between the forestry agency and TMAG, recognising the TFIC as a satellite, 'autonomous remote' collection of TMAG that would be re-housed by TMAG in the event of the forestry agency no longer being in a position to house the collection.



Fig. 3. Some of the standard metal insect cabinets which have been in use since the 1990s to house the Tasmanian Forest Insect Collection.

A period of rapid expansion

Following the Commission's 1994 corporatisation, the collection passed into the care of Forestry Tasmania, which moved to new offices in Melville Street. The new forestry model that emerged following the 1997 Tasmanian Regional Forest Agreement (RFA) demanded, and received, some Commonwealth funding for an expansion of insect-related research. The collection was housed in standard metal cabinets (Fig. 3), whose numbers were increased yearly to keep pace with accessions.

The increased emphasis on plantation forestry following the RFA required an

increase in research effort on plantation pest insects, as well as increased monitoring and surveillance activities to prevent incursions and outbreaks of new plantation or timber pests. Forestry Tasmania was contracted by the Australian Quarantine Inspection Services (AQIS) to develop and trial a port surveillance programme to provide an early-warning system for forest insect pest incursions. The programme, spread over several years, involved trapping insects in the vicinity of many of Tasmania's ports (Fig. 4), and generated large numbers of 'voucher'



Fig. 4. Surveillance sampling to detect possible incursions of forest pest insects.

A. Dick Bashford picking insects off a sticky trap among radiata pine.

B. A pheromone-baited panel intercept trap positioned near a Tasmanian port facility.

beetle specimens – particularly wood-borers – for the TFIC.

In line with the forestry sector’s drive to embrace ecological sustainability, in 2001 Forestry Tasmania appointed Simon Grove (SG) as conservation biologist in its research division. Much of the ensuing expansion of research effort over the following decade (before SG transferred to TMAG) was focused on exploring the relationship between native forest management and conservation outcomes. A series of studies using insects was embarked upon, involving a large number of researchers from a range of institutions. Much of the ecological and biodiversity research was conducted in the lowland

wet eucalypt forests in and around the Warra Long-Term Ecological Research Site established in southern Tasmania in 1996. The existence of Warra, and its status as a site of national significance for long-term ecological research, was pivotal in the continued expansion of the TFIC, since many studies depended on recording the occurrence of multiple insect species over long periods of time. Studies over this period included some focused purely on insect biodiversity (Fig. 5) and a suite of projects on saproxylic (dead-wood associate) insects aimed at exploring the conservation management implications of proposed harvesting of coarse woody debris for biofuel (Fig. 6) Additionally, Forestry

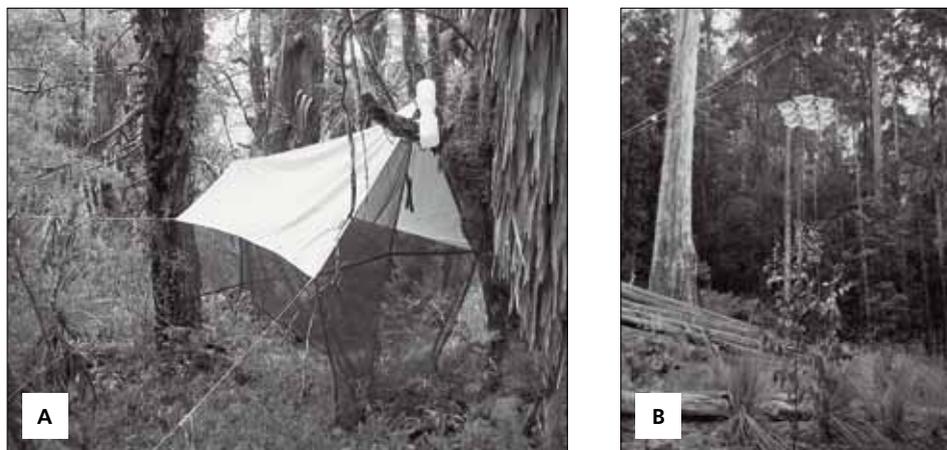


Fig. 5. Studies on aerial and arboreal insects.

- A.** A malaise trap sampling flying insects on an altitudinal transect running from Warra to Mount Weld.
- B.** Plastic funnels suspended below the canopy at Warra, collecting canopy-dwelling insects following insecticidal 'knock-down' fogging.

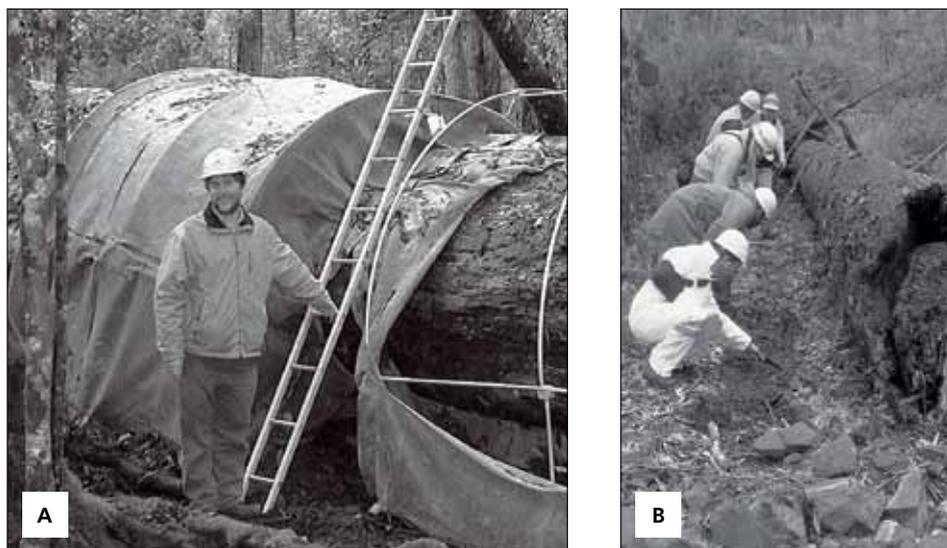


Fig. 6. Studies on log-dwelling insects.

- A.** Simon Grove in front of one of the twelve logs in the long-term study of succession in log-dwelling beetles at Warra.
- B.** Simon Grove (in foreground) and co-researchers searching for stag-beetles beneath excavator-rolled logs at Wielangta.

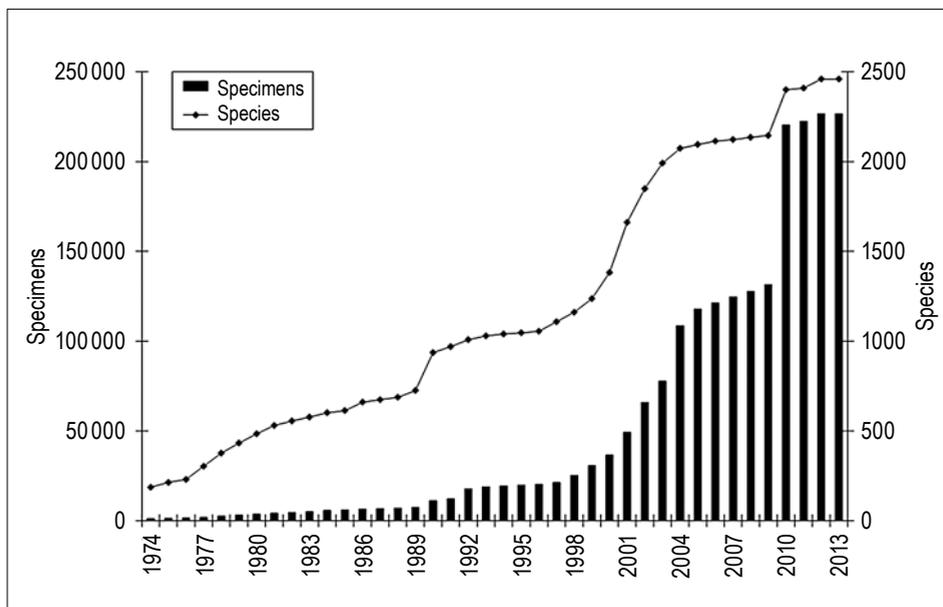


Fig. 7. Yearly cumulative number of databased insect species and specimens held in the TFIC since its inception in 1974.

Tasmania embarked on a major research project at Warra exploring the responses of biodiversity to clearfelling and its alternatives, monitoring insects using arrays of pitfall-traps and employing Dr Susan Baker to bring the entomological and other biodiversity findings together. Most recently, Forestry Tasmania undertook a major landscape-scale research project building on the findings of much of this earlier research. The project aimed at assessing the effectiveness for nature conservation of the combination of reservation and off-reserve management that has characterised forestry in the post-RFA era. The insect part of the project involved deploying flight intercept traps at locations across the

southern forests, accumulating massive numbers of insect specimens for the TFIC in the process.

In most of these studies, beetles were selected as the study-group of choice, partly because of their sheer diversity but not least because of their amenability to long-term storage as mounted specimens in a dry insect collection. Designing studies and analyses that could make sense of this astonishing diversity required retaining all the sampled beetle specimens in a central repository (the TFIC), applying uniform and stable code-names to the many unnamed species collected, and databasing all new accessions. It is for these reasons that the TFIC grew massively during this period (Fig. 7), with beetles from projects

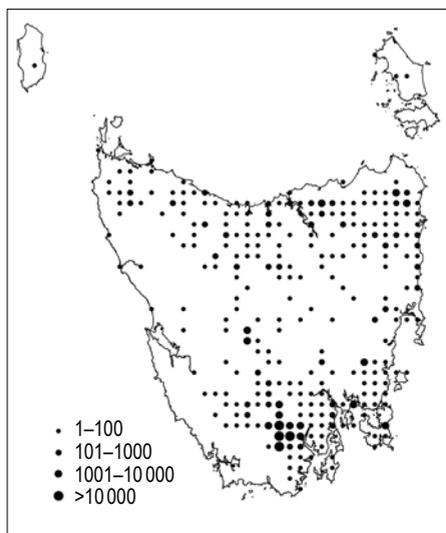


Fig. 8. State-wide representation of insect specimens in the Tasmanian Forest Insect Collection, in terms of the relative numbers of specimens originating from sites localised to within their respective ten-kilometre square grid cells. Note the aggregation of specimens originating from the southern forests west of Hobart, centred on the Warra Long-Term Ecological Research Site.

conducted in and around Warra coming to numerically dominate the TFIC (Table 1 & Fig. 8)

Consolidation

From early this century, all new accessions to the TFIC were automatically databased, with the numerical sample code appearing on the label associated with the specimen. However, this left a backlog of earlier accessions. Inroads into databasing were made with Commonwealth funding through the Australian Plant Pests Database

and the Australian National Heritage Assessment Tool. An estimated 90% of all the insects in the TFIC are currently databased. A web-site (www.tfic.net.au) was established by SG as a means of disseminating the ecological and taxonomic information stored in the database pertaining to the species in the TFIC. To keep museum-beetles and other pests at bay, a programme was introduced to cycle individual cabinet-drawers through the laboratory freezer.

During the phase of rapid expansion, formal identification of beetle species in the collection lagged behind the accumulation of specimens, despite several trips by the authors to Canberra to compare TFIC and ANIC material. Thus Forestry Tasmania was fortunate to engage the services of entomologist Lynne Forster. In addition to her own research, she has progressively worked through the collection, putting scientific names to species in some of the more obscure beetle families – although very many species cannot be named and are apparently undescribed. Her photographs of beetles from the collection (Fig. 9) have been progressively incorporated into the pages of the TFIC web-site. Also during this period, researchers from a range of interstate and overseas institutions made increasing use of the TFIC as a source of specimens for comparative taxonomy and for the description of new species. It is for this reason that the collection houses several species named after TFIC entomologists or the Warra LTER site, such as the marsh-beetle *Prionocyphon warra* Watts, 2010 (Scirtidae).



Fig. 9. Some beetles from the Tasmanian Forest Insect Collection.

TOP ROW: (L–R) *Saprosites mendax* (Blackburn, 1892) (Scarabaeidae); *Phlyctaenodes pustulatus* (Hope, 1841) (Cerambycidae); *Onthophagus mutatus* Harold, 1859 (Scarabaeidae); *Brycopia coelioides* (Pascoe, 1870) (Tenebrionidae).

SECOND ROW: (L–R) *Ganyme sapphira* (Newman, 1842) (Ulodidae); *Thallis vinula* Erichson, 1842 (Erotylidae); *Neopeltops* TFIC sp 01 (Leioidae); *Pedilophorus gemmatus* Lea, 1920 (Byrrhidae).

THIRD ROW: (L–R) *Diphucephala colaspoides* (Gyllenhal, 1817) (Scarabaeidae); *Dorcadida bilocularis* White, 1846 (Cerambycidae); *Lissotes bornemisszai* Bartolozzi, 2003 (Lucanidae); *Cyriodes imperialis* (Fabricius, 1801) (Buprestidae).

BOTTOM ROW: (L–R) *Tasmanityrus newtoni* Chanlder, 1987 (Staphylinidae); *Pseudomicrocara spilotus* (Blackburn, 1891) (Scirtidae); *Bicava verrucifera* Rucker (Latridiidae); *Micraspis frenata* Erichson, 1842 (Coccinellidae).

IMAGES (NOT TO SCALE) BY LYNNE FORSTER

Current status of the Tasmanian Forest Insect Collection

The TFIC currently comprises 26 metal cabinets of dry-mounted insect specimens, representing some 2450 species across 270 000 specimens. There are also small additional holdings of specimens in ethanol, such as the Reverend Bede Lowery's comprehensive reference collection of Tasmanian ants, donated to Forestry Tasmania in 1995. Over 99% of all databased insects in the TFIC are from the class Coleoptera (beetles). The remainder are from the orders Hemiptera (true-bugs), Hymenoptera (ants, bees and wasps), Isoptera (termites), Lepidoptera (butterflies and moths) and Orthoptera (crickets and grasshoppers).

Among the beetles are representatives of 90 families, of which 27 each contribute more than 1000 databased specimens (Table 2). The TFIC is replete with specimens belonging to species which associated entomologists have not yet managed to assign to formally described species. In total, fewer than 1000 of the species in the TFIC have been assigned formal names; the rest have been given code-names such as 'Curculionidae TFIC sp 01'. Numerically dominant beetle families which have proven particularly intractable include the Curculionidae (weevils), Staphylinidae (rove-beetles), Elateridae (click-beetles) and Ptiliidae (feather-winged beetles) (Table 2). Families in which the species are relatively well-known include the large and showy Cerambycidae (longhorn-beetles), Tenebrionidae (darkling-beetles), Carabidae (ground-beetles) and Scarabaeidae (scarab-beetles).

Like other natural history collections, the TFIC has proved difficult to value.

Table 1. The nineteen research projects each contributing more than 1000 specimens to the TFIC, with the names of associated lead researchers whose publications appear in an on-line Appendix: www.tmag.tas.gov.au/kanunnaah or http://www.tmag.tas.gov.au/collections_and_research/research

PROJECT	NUMBER OF SPECIMENS
Warra landscape biodiversity project (Wardlaw/Grove/Forster)	90 238
Warra silvicultural systems trial (Baker/Grove)	29 776
Warra log-decay beetle succession project (Grove)	17 339
Study on beetles and past biomass harvesting (Grove)	17 029
Warra-Mount Weld altitudinal transect (Doran/Driessen/Grove/Forster)	11 528
Study on beetles in wildlife habitat strips in wet forest at Tarraleah (Taylor/Grove)	9478
Warra invertebrate static trapping trials (Bashford)	9314
Wildlife habitat strips in plantations (Grove)	3425
Wildfire chronosequence beetles project (Grove)	5010
Port surveillance programme (Bashford)	3378
Warra log-dwelling beetles study (Yee)	3089
Study on insects associated with myrtle (Coy)	2663
Study on the role of mature-forest influence on biodiversity (Baker)	2362
Study on Tasmanian wood-borers and their host-plants (Bashford)	1866
Warra study on beetles associated with old trees (Harrison)	1856
Warra study on beetles associated with tree-wounds (Harrison)	1370
Study on beetles in wildlife habitat strips in dry forest at Pioneer (Taylor/Grove)	1240
East Coast wood-chipping insects study (Elliott/Bashford)	1042
Warra canopy-fogged beetles study (Bashford)	1027

Partial scientific recognition of the value of the TFIC exists in terms of the large number of publications that have arisen based on material now held in the TFIC (see on-line Appendix). In terms of monetary value, in 2002 Forestry Tasmania asked the Australian Valuation Office to suggest a dollar figure for tax offset purposes. It determined that the collection was then worth about \$620 000 in terms of its replacement value. That being the case, its current replacement value is likely to be at least double this amount.

Future management of the Tasmanian Forest Insect Collection relocation

In recent years, while Forestry Tasmania bore much of the cost of managing the TFIC, the benefits were increasingly accrued by a much wider community of researchers, quarantine officers, forest health officers, conservationists and systematists. The recent upheavals in the forestry sector resulted in a major shift in priorities for Forestry Tasmania and called for significant cost savings. The TFIC was clearly in need of a new home. The 1995 memorandum of understanding between

Table 2. The 27 families of beetles which each contribute more than 1000 databased specimens to the TFIC. The number of species that these specimens represent is also given, with a figure provided for those not yet assigned to formally described species.

FAMILY	NUMBER OF SPECIMENS	NUMBER OF SPECIES	NUMBER OF UNNAMED SPECIES
Staphylinidae (rove-beetles)	31 721	431	392
Carabidae (ground-beetles)	31 922	133	25
Latridiidae (minute brown scavenger-beetles)	23 519	25	17
Curculionidae (weevils)	24 004	466	339
Leiodidae (round fungus-beetles)	21 190	58	39
Cryptophagidae (silken fungus-beetles)	16 295	17	14
Salpingidae (narrow-waisted bark-beetles)	13 985	3	1
Clambidae (fringe-winged beetles)	6433	7	3
Hobartiidae (Hobart-beetles)	4791	1	0
Chrysomelidae (leaf-beetles)	4772	157	71
Sphindidae (cryptic slime-mould beetles)	4466	3	1
Corylophidae (minute hooded beetles)	3129	25	24
Nitidulidae (sap-beetles)	3006	22	8
Phloeostichidae (sapwood-beetles)	2299	1	0
Cerambycidae (longhorn beetles)	2179	73	13
Elateridae (click-beetles)	2106	82	69
Scarabaeidae (scarab beetles)	2085	62	12
Zopheridae (iron-clad beetles)	1971	26	8
Anobiidae (woodworm beetles)	1862	46	31
Oedemeridae (false blister-beetles)	1614	8	3
Lucanidae (stag-beetles)	1544	26	2
Tenebrionidae (darkling-beetles)	1518	55	18
Cantharidae (soldier-beetles)	1514	17	9
Melandryidae (false darkling-beetles)	1445	38	32
Scirtidae (marsh-beetles)	1443	27	13
Ptiliidae (feather-winged beetles)	1405	19	19
Coccinellidae (ladybirds)	1011	50	38

Forestry Tasmania and TMAG was re-drafted and re-signed in 2011, paving the way for the TFIC to be progressively re-housed at TMAG. All the cabinets containing insects other than beetles were transferred to TMAG's collections and

research facility at Rosny, in late 2012 and early 2013. Those cabinets containing the beetle component of the collection will be transferred later in 2013 and in 2014, once on-going ecological research making use of the collections is completed.

Responsibility for the web-site has also passed to TMAG.

Integration

TMAG already maintains an extensive insect collection, but for beetles it is dwarfed by the TFIC. The plan is to integrate the two collections while maintaining the integrity of the TFIC. This will be a significant logistical challenge, both in terms of physical storage space in the collections hall, and in databasing. In the longer term it will be desirable to eventually transfer all dry-mounted TFIC material into wooden cabinets, which are lower-maintenance than metal ones in regard to keeping museum-beetle and other pests at bay. The TFIC material is databased at the level of the unique sample from which it originated, rather than at the level of each individual mount.

A major task will be progressively adding individual TMAG registration numbers to the TFIC records and to the physical specimens themselves.

On-going taxonomic work

The presence of so many undescribed or otherwise unnamed specimens in the TFIC makes it a ready source of material for future taxonomic work by TMAG's own taxonomic experts and by those from other institutions. With Lynne Forster, Simon Grove is planning to formally describe new beetle species from the TFIC in the genera *Neopelatops* (Leiodidae) and *Dryophthorus* and *Exithius* (Curculionidae). In this context, it will be important to keep the TFIC web-site up-to-date as it is a ready means of advertising the existence and nature of the collection to the wider taxonomic community.

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Many people involved in the development and management of the TFIC have already been mentioned, either in the body of this paper or in its appendix. Additionally the authors would like to thank Dr Tim Wardlaw at FT for his unwavering support for our insect work and for the TFIC. We would also like to acknowledge the hard work of Nita Ramsden and Alison Phillips, who each spent many years at FT processing insect

samples and generally maintaining the scientific integrity of the TFIC.

Ruiping Gao at FT kindly prepared Fig. 8. Humphrey Elliott and Forestry Tasmania are thanked for permission to reproduce the images in Figs. 1–6, all of which previously appeared in Elliott, H.J., Felton, K.C., Jarman, S.J. and Stone, M.J., 2008. *A history of innovation: eighty-five years of research and development at Forestry Tasmania*. Hobart: Forestry Tasmania, 392 pp.

References

- Bashford, R. (1990) *Tasmanian forest insects and their host plants: records from the Tasmanian Forestry Commission insect collection*. Hobart: Tasmanian Forestry Commission, 32 pages.
- Elliott, H.J. & deLittle, D.W. (1985) *Insect pests of trees and timber in Tasmania*. Hobart: Tasmanian Forestry Commission, 90 pages.
- Elliott, H.J., Felton, K.C., Jarman, S.J. & Stone, M.J., 2008. *A history of innovation: eighty-five years of research and development at Forestry Tasmania*. Hobart: Forestry Tasmania, 392 pages.

Appendix

This appendix comprises a bibliography listing a selection of papers and reports on research that has contributed to, and/or is based upon material in, the Tasmanian Forest Insect Collection.

- Archer, L. (1999) Forestry impacts on the bryophyte-inhabiting staphylinoid beetles (Pselaphidae, Scydmaenidae and Staphylinidae) in a chronosequence of coupes, Warra LTER site. Honours thesis, University of Tasmania, Hobart.
- Baker, S., Barmuta, L., Grove, S. & Richardson, A. (2009) Are streamside buffers edge-affected habitat for ground-dwelling forest beetle assemblages? *Biodiversity and Conservation* 18: 3467–3482.
- Baker, S.C. (2000) *Forest litter beetles and their habitat: a comparison of forest regenerated by wildfire and logging practices*. Honours thesis, University of Tasmania, Hobart.
- Baker, S.C. (2006) A comparison of litter beetle assemblages (Coleoptera) in mature and recently clearfelled *Eucalyptus obliqua* forest. *Australian Journal of Entomology*. 45: 130-136.
- Baker, S.C. (2006) *Ecology and conservation of ground-dwelling beetles in managed wet eucalypt forest: edge and riparian effects*. PhD thesis, University of Tasmania, Hobart.
- Baker, S.C. & Barmuta, L.A. (2006) Evaluating spatial autocorrelation and depletion in pitfall-trap studies of environmental gradients. *J. Insect Cons.* 10: 269–276.
- Baker, S.C., Barmuta, L A, McQuillan, P.B., & Richardson, A.M.M. (2007) Estimating edge effects on ground-dwelling beetles at clearfelled non-riparian stand edges in Tasmanian wet eucalypt forest. *Forest Ecology and Management* 239: 92-101.
- Baker, S.C., Barmuta, L.A. and Richardson, A.M.M. (2009) Response of ground-dwelling beetles across logging coupe edges into streamside reserves. *Australian Journal of Entomology*. 48: 194-203.
- Baker, S.C., Elek, J.A., Bashford, R., Paterson, S.C., Madden, J. & Battaglia, M. (2003) Inundative release of coccinellid beetles into eucalypt plantations for biological control of chrysomelid leaf beetles. *Agricultural and Forest Entomology* 5: 97–106.
- Baker, S.C., Grove, S.J., Forster, L., Bonham, K.J. and Bashford, R. (2009) Short-term responses of ground-active beetles to alternative silvicultural systems in the Warra Silvicultural Systems Trial, Tasmania, Australia. *Forest Ecology and Management* 258: 444–459.
- Baker, S.C., Neyland, M. & Grove, S.J. (2010) Using aggregated retention to maintain and restore mature-forest values in managed forest landscapes in Tasmania. *Ecological Management and Restoration* 11 (1): 82.
- Baker, S.C., Richardson, A.M.M., Barmuta, L.A. & Thomson, R. (2006) Why conservation reserves should not always be concentrated in riparian areas: a study of ground-dwelling beetles in wet eucalypt forest. *Biological Conservation* 133: 156–168.
- Baker, S.C., Richardson, A.M.M., Barmuta, L.A. (2007) Site effects outweigh riparian influences on ground-dwelling beetles adjacent to first

- order streams in wet eucalypt forest. *Biodiversity Conservation* 16: 1999–2014.
- Baker, S.C., Richardson, A.M.M., Seeman, O.D., & Barmuta, L.A. (2004) Does clearfell, burn and sow silviculture mimic the effect of wildfire? A field study and review using litter beetles. *Forest Ecology and Management* 199: 433–448.
- Bar-Ness, Y.D., Kirkpatrick, J.B., & McQuillan, P.B. (2006) Age and distance effects on the canopy arthropod composition of old-growth and 100-year-old *Eucalyptus obliqua* trees. *Forest Ecology and Management* 226: 290–298.
- Bartolozzi, L. (1996) Description of a new species of *Hoplogonus* Parry, 1875 from Tasmania (Coleoptera, Lucanidae). *Redia* 79: 91–95.
- Bashford, R. (1990) *Tasmanian forest insects and their host plants: records from the Tasmanian Forestry Commission insect collection*. Hobart: Tasmanian Forestry Commission, 32 pp.
- Bashford, R. (1990) The dispersal of ground beetles into different aged eucalypt plantations in north-eastern Tasmania. *Tasforests* 2 (1): 43–51.
- Bashford, R. (1991) Wood-boring Coleoptera and associated insects reared from *Acacia dealbata* Link in Tasmania. *Australian Entomological Magazine* 18 (3): 103–110.
- Bashford, R. (1993) Insect pest problems of eucalypt plantations in Australia. 4. Tasmania. *Australian Forestry* 56 (4): 375–377.
- Bashford, R. (1994) Life history and mortality of the longicorn *Epithora dorsalis* MacLeay (Coleoptera: Cerambycidae) in Tasmania. *Australian Entomologist* 21 (4): 125–136.
- Bashford, R. (1995) *Tryphocaria mastersi* Pascoe: a cerambycid causing death of young *E. nitens* and *E. globulus* in Tasmania. *Forest Entomology Research Working Group Newsletter* 12: 29–31.
- Bashford, R. (1997) Records of insects associated with *Acacia dealbata* Link in Tasmania. *Australian Entomologist* 24: 109–115.
- Bashford, R. (1998) Tasmanian ant species collected by Bede Lowery. *The Tasmanian Naturalist* 120: 45–47.
- Bashford, R. (1999) An adjustable light trap stand for insect monitoring in tree plantations. *Victorian Entomologist* 29(3): 53–55.
- Bashford, R. (1999). Predation by ladybird beetles (coccinellids) on immature stages of the Eucalyptus leaf beetle *Chrysophtharta bimaculata* (Olivier) *Tasforests* 11: 77–86.
- Bashford, R. (2001) Some records of arboreal carabid beetles in Tasmania. *Victorian Entomologist* 31: 97–100.
- Bashford, R. (2001) The spread and impact of the introduced vespine wasps *Vespula germanica* (F.) and *Vespula vulgaris* (L.) (Hymenoptera: Vespinae) in Tasmania. *Australian Entomologist* 28 (1): 1–12.
- Bashford, R. (2002) The insect fauna inhabiting *Uromycladium* (Uredinales) rust galls on silver wattle (*Acacia dealbata*) in Tasmania. *Australian Entomologist* 29 (3): 81–95.
- Bashford, R. (2002) The use of sticky trap bands as a long term monitoring tool for detecting exotic saproxylic insects of importance to forestry. *Victorian Entomologist* 32 (3): 42–44.
- Bashford, R. (2004) The insects associated with galls formed by *Trichilogaster acaciaelongifoliae* (Froggatt) (Hymenoptera: Pteromalidae) on *Acacia* species in Tasmania. *Australian Entomologist* 31 (1): 5–12.
- Bashford, R., Taylor, R.J., Driessen, M., Doran, N. & Richardson, A.M.M. (2001). Research on invertebrate assemblages at the Warra LTER site. *Tasforests* 13 (1): 109–118.
- Beveridge, N. & Elek, J.A. (1999) *Bacillus thuringiensis* var. *tenebrionis* shows no toxicity to the predator *Chauliognathus lugubris* (F.) (Coleoptera: Cantharidae) *Australian Journal of Entomology*. 38: 34–39.
- Beveridge, N. & Elek, J.A. (2001) Insect and host-tree species influence the effectiveness of a *Bacillus thuringiensis* spp. *tenebrionis*-based insecticide for controlling chrysomelid leaf beetles. *Australian Journal of Entomology* 40: 386–390.
- Bonham, K.J., Mesibov, R. & Bashford, R. (2002) Diversity and abundance of some ground-dwelling invertebrates in plantation vs. native forests in Tasmania, Australia. *Forest Ecology and Management* 158: 237–247.
- Candy, S.G., Elliott, H.J., Bashford, R. & Greener, A. (1992) Modelling the impact of defoliation by the leaf beetle *Chrysophtharta bimaculata* (Olivier) (Coleoptera: Chrysomelidae) on height growth of *Eucalyptus regnans*. *Forest Ecology and Management* 54: 69–87.
- Chandler, D.S. (2001) Biology, morphology and systematics of the ant-like litter beetle genera of Australia (Coleoptera: Staphylinidae: Pselaphinae). Gainesville: Associated Publishers, 560 pp.

- Cowie, D. (2001) *Jewel beetles of Tasmania: a field naturalist's guide*. Hobart: Tasmanian Field Naturalists Club, 41 pp.
- Coy, R., Greenslade, P. and Rounsevell, D. (1993) *A Survey of Invertebrates in Tasmanian Rainforest*. National Rainforest Conservation Programme Report no. 9. Tasmania: Parks and Wildlife Service and Canberra: Department of Arts, Sport, the Environment and Territories. 104 pp.
- deLittle, D. (1979) A preliminary review of the genus *Paropsis* Olivier (Coleoptera: Chrysomelidae) in Tasmania. *Journal of the Australian Entomological Society* 18: 91–107.
- deLittle, D.W. (1979) *Taxonomic and ecological studies of the Tasmanian eucalyptus-defoliating paropsids (Coleoptera: Chrysomelidae), with particular reference to Chrysophtharta bimaculata (Olivier)* PhD thesis, University of Tasmania, Hobart.
- deLittle, D.W. (1989) Paropsine chrysomelid attack on plantations of *Eucalyptus nitens* in Tasmania. *Journal of Forest Science* 19: 223–227.
- Doran, N., Balmer, J., Driessen, M., Bashford, R., Grove, S.J., Richardson, A.M.M., Griggs, J., & Ziegeler, D. (2003) Moving with the times: baseline data to gauge future shifts in vegetation and invertebrate altitudinal assemblages due to environmental change. *Organisms, Diversity and Evolution* 3: 127–149.
- Driessen, M.M. and Mallick, S. A. (2013) The distributions of invertebrate species along the Warra-Mt Weld altitudinal transect in 2001–2002 and identification of taxa restricted by altitude. DPI/PWE Nature Conservation Report 13 (4).
- Driscoll, D. A. (2010) Few beetle species can be detected with 95% confidence using pitfall traps. *Austral Ecology*. 35: 13–23.
- Driscoll, D., Kirkpatrick, J.B., McQuillan, P.B. & Bonham, K.J. (2010) Classic metapopulations are rare among common beetle species from a naturally fragmented landscape. *Journal of Animal Ecology* 79: 294–303.
- Elek, J.A. (1997). Assessing the impact of leaf-beetles in eucalypt plantations and exploring options for their management. *Tasforests* 9: 139–154.
- Elliott, H. & Greener, A. (1993) *Prospects for using Bacillus thuringiensis to control eucalypt leaf-beetles in Tasmania*. In: Akhurst, R.J. (Ed.), Proc. 2nd Canberra Meeting on *Bacillus thuringiensis*. CPN Publications, Canberra, pp. 147–152.
- Elliott, H.J. & deLittle, D.W. (1980) Laboratory studies on predation of *Chrysophtharta bimaculata* (Olivier) (Coleoptera: Chrysomelidae) eggs by the coccinellids *Cleobora mellyi* Mulsant and *Harmonia conformis* (Boisduval). *General and Applied Entomology* 12: 33–36.
- Elliott, H.J. & deLittle, D.W. (1985) *Insect pests of trees and timber in Tasmania*. Hobart: Tasmanian Forestry Commission, 90 pp.
- Elliott, H.J. (1978) Studies on the fireblight beetle, *Pyrgoides orphanana* (Erichson) (Coleoptera: Chrysomelidae) and its effect on the growth of silver wattle in Tasmania. *Australian Forestry* 41: 160–166.
- Elliott, H.J. (1990) The role of insects in changing forest vegetation in Tasmania. *Tasforests* 2(2): 111–116.
- Elliott, H.J. and de Little, D.W. (1985) *Insects Pests of Trees and Timber in Tasmania*. Forestry Commission, Tasmania.
- Elliott, H.J., Bashford, R., Jarman, S.J. and Neyland, M.G. (2002) Foliage insect diversity in dry eucalypt forests in eastern Tasmania. *Papers and Proceedings of the Royal Society of Tasmania* 136: 17–34.
- Elliott, H.J., Elek, J.A. & Bashford, R. (1995) *Control options for the leaf beetle, Chrysophtharta bimaculata (Olivier) (Coleoptera: Chrysomelidae) in eucalypt plantations in Tasmania*. In: Proceedings of the XX International Congress of Entomology, Firenze, Italy, pp. 516–520.
- Elliott, H.J., Madden, J.L. & Bashford, R. (1983) The association of ethanol in the attack behaviour of the mountain pinhole borer *Platypus subgranosus* Schedl. (Coleoptera: Curculionidae: Platypodinae) *Journal of the Australian Entomological Society* 22: 299–302
- Elliott, H.J., Ohmart, C.P. & Wylie, F.R. (1998) *Insect pests of Australian forests: ecology and management*. Melbourne: Inkata Press, 214 pp.
- Ettershank, G. & Ettershank, J.A. (1993) Tasmanian leatherwoods (*Eucryphia* spp.): floral phenology and the insects associated with flowers. *Tasmanian NRCP Report* 11: 64 pp.
- Forster, L. & Grove, S.J. (2008) *The beetles (Coleoptera) of the Warra – Mount Weld Altitudinal Transect Ecotonal and Baseline Altitudinal Monitoring Plots (BAMPs)* Hobart: Forestry Tasmania.
- Fountain-Jones, N., McQuillan, P.B. and Grove, S.J. (2012) Beetle communities associated with the tree fern *Dicksonia antarctica* Labill. in Tasmania. *Australian Journal of Entomology* 51: 154–165.

- Grove, S. (2006) *A research agenda for insects and dead wood*. Pp. 98–108 in Grove, S.J. & Hanula, J.L. (Ed.), *Insect biodiversity and dead wood. Proceedings of a symposium at the International Congress of Entomology, Brisbane, Australia, August 2004*. USDA Forest Service Southern Research Station General Technical Report SRS-93, Asheville, N.C.
- Grove, S., Bashford, R. & Yee, M. (2009) A long-term experimental study of saproxylic beetle (Coleoptera) succession in Tasmanian *Eucalyptus obliqua* logs: findings from the first five years. In: Fattorini, S. (Ed.), *Insect Ecology and Conservation*. Research Signpost, pp. 71–114.
- Grove, S.J. & Bashford, R. (2003). Beetle assemblages from the Warra log decay project: insights from the first year of sampling. *Tasforests* 14: 117–129.
- Grove, S.J. & Meggs, J.M. (2003) Coarse woody debris biodiversity and management: a review with particular reference to Tasmanian wet eucalypt forests. *Australian Forestry* 66: 258–272.
- Grove, S.J. & Yaxley, B. (2004) A species of jewel beetle (Coleoptera: Buprestidae) new to Tasmania. *The Tasmanian Naturalist* 126: 29–30.
- Grove, S.J. & Yaxley, B. (2005) Wildlife habitat strips and native forest ground-active beetle assemblages in plantation nodes in northeast Tasmania. *Australian Journal of Entomology* 44 (4): 331–343.
- Grove, S.J. (2002) A review of biodiversity conservation issues relating to coarse woody debris management in the wet eucalypt production forests of Tasmania. Hobart: Forestry Tasmania.
- Grove, S.J. (2003) Maintaining data integrity in insect biodiversity assessment projects. *Journal of Insect Conservation* 7: 33–44.
- Grove, S.J. (2007) Mudguts. *The Tasmanian Naturalist* 129: 2–7.
- Grove, S.J. (2009) Do wildlife habitat strips act as refuges for mature-forest carabid beetle assemblages? A case-study in Tasmanian wet eucalypt forest, Australia. *Forest Ecology and Management* 259: 496–504.
- Grove, S.J. (2009a). A decade of deadwoodology at Warra. *The Tasmanian Naturalist* 131: 25–35.
- Grove, S.J. (2009b). Beetles and fuelwood harvesting: a retrospective study from Tasmania's southern forests. *Tasforests* 18: 77–99.
- Grove, S.J. and Forster, L. (2010) A decade of change in the saproxylic beetle fauna of eucalypt logs in the Warra long-term log-decay experiment, Tasmania. 1. Description of the fauna and seasonality patterns. *Biodiversity and Conservation* 20: 2149–2165.
- Grove, S.J. and Forster, L. (2010) A decade of change in the saproxylic beetle fauna of eucalypt logs in the Warra long-term log-decay experiment, Tasmania. 2. Log-size effects, succession, and the functional significance of rare species. *Biodiversity and Conservation* 20: 2167–2188.
- Grove, S.J., Richards, K., Spencer, C. & Yaxley, B. (2006). What lives under large logs in Tasmanian eucalypt forest? *The Tasmanian Naturalist* 128: 86–93.
- Harrison, K.S. (2007) Saproxylic beetles associated with habitat features in *Eucalyptus obliqua* trees in the southern forests of Tasmania. PhD thesis, University of Tasmania, Hobart.
- Higgs, K. (1994) Hidden hunters: a study of predatory litter beetles (Staphylinidae, Pselaphidae and Scydmaenidae) in cool temperate forests of Tasmania and northern New South Wales. Honours thesis, University of Tasmania, Hobart.
- Hopkins, A.J.M., Harrison, K.S., Grove, S.J., Wardlaw, T.J. & Mohammed, C.L. (2005). Wood-decay fungi and beetle assemblages associated with living *Eucalyptus obliqua* trees: early results from studies at the Warra LTER Site, Tasmania. *Tasforests* 16: 111–126.
- Jennings, J.T., Austin, A.D. and Bashford, R. (2009) First record of the wood-wasp family Xiphydriidae from Tasmania with a description of a new species and host record. *Australian Journal of Entomology* 48: 25–28.
- Kile, G.A. (1974) Insect defoliation in eucalypt regrowth forests of southern Tasmania. *Australian Forestry Research* 6: 9–18.
- Leon, A. (1989). The Tasmanian *Eucalyptus* leaf beetle, *Chrysophtharta bimaculata*: an overview of the problem and current control methods. *Tasforests* 1: 33–37.
- Lowery, B. B. and Taylor, R. J. (1994) Occurrence of ant species in a range of sclerophyll forest communities at Old Chum Dam, north-eastern Tasmania. *Australian Entomologist* 21: 11–14.
- Meggs, J.M. & Munks, S.A. (2003) Distribution, habitat characteristics and conservation requirements of a forest-dependent threatened invertebrate *Lissotes latidens* (Coleoptera: Lucanidae) *Journal of Insect Conservation* 7 (3): 137–153.

- Meggs, J.M. & Taylor, R.J. (1999) Distribution and conservation status of the Mt Mangana stag beetle, *Lissotes menalcas* (Coleoptera: Lucanidae) *Papers and Proceedings of the Royal Society of Tasmania* 133 (1): 23–28.
- Meggs, J.M., Munks, S.A. & Corkrey, R. (2003) The distribution and habitat characteristics of a threatened lucanid beetle, *Hoplogonus simsoni*, in north-east Tasmania. *Pacific Conservation Biology* 9: 172–186.
- Meggs, J.M., Munks, S.A., Corkrey, R. & Richards, K. (2004) Development and evaluation of predictive habitat models to assist the conservation planning of a threatened lucanid beetle, *Hoplogonus simsoni*, in north-east Tasmania. *Biological Conservation* 118: 501–511.
- Mensah, R.K. & Madden, J.L. (1994) Conservation of two predator species for biological control of *Chrysophtharta bimaclulata* (Col: Chrysomelidae) in Tasmanian forests. *Entomophaga* 39: 71–83.
- Mesibov, R. (1988) *Log Invertebrate Project*. Hobart: Forestry Tasmania.
- Mesibov, R. (1993) Species-level comparison of litter invertebrates from three vegetation types in northwest Tasmania. *Tasmanian National Rainforest Conservation Programme (Hobart)* Report 13.
- Mesibov, R. (1997) Land snails, landhoppers, millipedes and carabid beetles in mature and regrowth forest near Tahune Bridge. Hobart: Forestry Tasmania.
- Mesibov, R. (1998) Species-level comparison of litter invertebrates at two rainforest sites in Tasmania. *Tasforests* 10: 141–157.
- Michaels, K.F. & Bornemissza, G. (1999) Effects of clearfell harvesting on lucanid beetles (Coleoptera: Lucanidae) in wet and dry sclerophyll forests in Tasmania. *Journal of Insect Conservation* 3: 85–95.
- Munks, S., Richards, K., Meggs, J., Wapstra, M. & Corkrey, R. (2004) Distribution, habitat and conservation of two threatened stag beetles, *Hoplogonus bornemisszai* and *H. vanderschoori* (Coleoptera: Lucanidae) in north-east Tasmania. *Australian Zoologist* 32 (4): 586–596.
- Nahrung, H. (2004) Biology of *Chrysophtharta agricola* (Coleoptera: Chrysomelidae), a pest of *Eucalyptus* plantations in south-eastern Australia. *Australian Forestry* 67: 59–66.
- Nahrung, H.F. & Murphy, B.D., (2002) Differences in egg parasitism of *Chrysophtharta agricola* (Chapuis) (Coleoptera: Chrysomelidae) by *Ennogera nassaui* Girault (Hymenoptera: Pteromalidae) in relation to host and parasitoid origin. *Australian Journal of Entomology* 41: 267–271.
- Nash, S. (2004) Comparisons of gene flow and dispersal in a tenebrionid beetle in wet eucalypt forest and fuelwood harvested coupes in southern Tasmania. Honours thesis, LaTrobe University, Melbourne.
- Ramsden, N. & Elek, J.A. (1998) Life-cycle and development rates of the leaf-beetle *Chrysophtharta agricola* (Chapuis) (Coleoptera: Chrysomelidae) on *Eucalyptus nitens* at two temperature regimes. *Australian Journal of Entomology* 37: 238–242.
- Reid, C.A.M. (2006) A taxonomic revision of the Australian Chrysomelinae, with a key to the genera (Coleoptera: Chrysomelidae). *Zootaxa* 1292: 1–119.
- Rice, D.R. (2005) *The larval parasitoid guild of Chrysophtharta agricola (Coleoptera: Chrysomelidae): host – parasitoid ecological and developmental interactions*. Hobart, doctoral thesis, University of Tasmania, 228 pp.
- Semmens, T.D., McQuillan, P.B. & Hayhurst, G. (1992) *Catalogue of the insects of Tasmania*. Hobart: Department of Primary Industry.
- Taylor, R.J. (1990) Occurrence of log-dwelling invertebrates in regeneration and oldgrowth wet sclerophyll forest in southern Tasmania. *Papers and Proceedings of the Royal Society of Tasmania* 124: 27–34.
- Taylor, R.J., Michaels, K., & Bashford, D. (2000) Occurrence of old-growth carabid beetles in retained unlogged strips in production forests in southern Tasmania. In: Saunders, D. *et al.* (Eds.), *Nature Conservation 5: Managing the matrix*. Sydney: Surrey Beatty, pp. 120–127.
- Turner, P.A.M., Grove, S.J. & Airey, C.M. (2007) *Wildfire Chronosequence Project Establishment Report*. Bushfire Cooperative Research Centre, Melbourne.
- Wall, D.H., and 35 others. (2008) Global decomposition experiment shows soil animal impacts on decomposition are climate-dependent. *Global Change Biology* 14: 2661–2677.
- Wardlaw, T.J., Grove, S.J., Balmer, J., Hingston, A., Forster, L., Schmuki, C. and Read, S. (2012) Persistence of mature-forest biodiversity elements in a production-forest landscape managed under

- a Regional Forest Agreement. Technical Report no. PNC142-0809. Forest and Wood Products Australia.
- Wardlaw, T.J., Grove, S.J., Hopkins, A.J.M., Yee, M., Harrison, K.S. & Mohammed, C.L. (2009). The uniqueness of habitats in old eucalypts: contrasting wood-decay fungi and saproxylic beetles of young and old eucalypts. *Tasforests* 18: 19–32.
- Watson, S. (2003) Dispersal and gene flow in *Prostomis atkinsoni* (Coleoptera) Honours thesis, LaTrobe University, Melbourne.
- Watts, C.H.S. (2007) Revision of Australian *Pseudomicrocara* Armstrong (Coleoptera: Scirtidae). *Transactions of the Royal Society of South Australia* 131 (1): 1–82.
- Watts, C.H.S. (2009) Revision of *Heterocyphon* Armstrong, *Peneveronatus* Armstrong and *Accolabass* gen. nov. (Scirtidae: Coleoptera). *Transactions of the Royal Society of South Australia* 133 (1): 108–149.
- Watts, C.H.S. (2010) Revision of Australian *Prionocyphon* Redtenbacher (Scirtidae: Coleoptera). *Transactions of the Royal Society of South Australia* 134 (1): 53–88.
- Watts, C.H.S. (2010) Revision of the genus *Macrohelodes* (Scirtidae: Coleoptera: Insecta). *Transactions of the Royal Society of South Australia* 134 (1): 19–52.
- Yaxley, B. (2000) *An overview of weevils of the genus Merimnetes associated with native conifers in Tasmania*. Honours thesis, University of Tasmania.
- Yaxley, B. (2000) Arthropod communities on native conifers of Tasmania. Honours thesis, University of Tasmania, Hobart, 126 pages.
- Yee, M., Grove, S.J., Richardson, A.M.M. & Mohammed, C.L. (2006) Brown rot in inner heartwood: why large logs support characteristic saproxylic beetle assemblages of conservation concern. In Grove, S.J. and Hanula, J.L. (eds.) *Insect biodiversity and dead wood*, pp. 42–56. USDA Forest Service, Southern Research Station.
- Yee, M., Yuan, Z.-Q., & Mohammed, C.L. (2001) Not just waste wood: decaying logs as key habitats in Tasmania's wet sclerophyll *Eucalyptus obliqua* production forests: the ecology of large and small logs compared. *Tasforests* 13: 119–128.