MATERIAL APPROACHES TO POLYNESIAN BARKCLOTH

CLOTH, COLLECTIONS, COMMUNITIES

edited by
FRANCES LENNARD
& ANDY MILLS

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Biographies

Ruby Antonowicz-Behnan

Ruby Antonowicz-Behnan trained at the Centre for Textile Conservation and Technical Art History, University of Glasgow, volunteering on the research project *Situating Pacific Barkcloth in Time and Place*. The experience led her to a dissertation titled *A Preliminary Investigation into the Use of Wet Cleaning Treatments for the Conservation of Pacific Island Barkcloth*. Since graduating she has worked for the Victoria and Albert Museum, and in 2018 contributed a poster on her dissertation research at the symposium, *Recent Advances in Barkcloth Conservation and Technical Analysis*, held at Royal Botanic Gardens, Kew. Ruby is currently working for Historic Royal Palaces textile conservation treatment team at Hampton Court Palace.

Michele Austin Dennehy

Michele Austin Dennehy has over thirty years' experience working in the field of objects conservation with a focus on collaborative engagement. As a conservator in private practice she supported exhibitions and special projects for the Smithsonian Institution National Museum of Natural History including a three-year effort to conserve vulnerable Polynesian tapa collected by the US Exploring Expedition where she worked closely with community scholars from Polynesia. As well as preserving the tapa, the project aimed to put it into the hands of scholars and researchers who often need to touch the artefacts as a critical part of their research.

Jean Chapman Mason

Jean Chapman Mason is curator of the Cook Islands Library and Museum Society. In her role as museum curator Jean has written on dance, weaving, tapa, and tattoo. She was an intern at the Smithsonian Museum of Natural History, Washington DC, in July 2013 as part of the Wilkes Tapa Project conservation of tapa cloth. Her most recent publication 'The tutunga is silent now: the lost art of tapa making in the Cook Islands' appeared in *TAPA – De L'Écorce À L'Étoffe, Art Millénaire D'Océanie*. *From Tree Bark to Cloth, An Ancient Art of Oceania*, Somogy éditions d'Art, Paris, France, ed. Michel Charleux, 2017.

Alice Christophe

Dr Alice Christophe is the Benioff Curator of Oceania at the British Museum (London, UK) and the former Collections Manager for Ethnology at the Bernice Pauahi Bishop Museum (Honolulu, Hawai‘i). She trained in Oceanic Art History and Museology at the École du Louvre (Paris, France) before undertaking a PhD in Art History and World Art Studies at the Sainsbury Research Unit, University of East Anglia (Norwich, UK). Completed in 2016, her PhD thesis explores the role of Pacific museums in establishing, strengthening and reactivating trans-Oceanic networks through exhibition making. Throughout her research journey, Dr Christophe was fortunate to work and collaborate with museum caretakers, practitioners and artists in Hawai‘i, Aotearoa New Zealand, Kanaky New Caledonia, Taiwan, England and France. Her research interests include Pacific museology, collection trajectories, museum genealogies and museum caring methodologies.

Jean Clarkson

Jean Clarkson is an artist and teacher. She was born in Auckland, to a Norfolk Island mother and a Scottish father. She has a Diploma in Fine Arts with Honours from Auckland University. For over 25 years Jean has been involved with art education at tertiary level. She has also taught in the prison system and run workshops in the community. Her work is held in many collections, including the Museum of New Zealand Te Papa Tongarewa and the Australian National Gallery in Canberra.

Brittany Curtis

Brittany Curtis is a graduate of the UCL Museum Studies MA programme and a volunteer at the National Museum of the American Indian. She interned at Kew’s Economic Botany Collection while conducting a research project on a portion of the tapa collection. She developed an interest in barkcloth and Pacific material culture while conducting field work for her undergraduate ethnographic thesis in Hawai‘i. She is passionate about increasing narratives of indigenous agency in museum collections.

Su’a Tupuola Uilisone Fitiao

My family moved to American Samoa in 1969. I learned our traditional form of painting called Siapo in the late 1970s from the late Mary J. Pritchard, a big inspiration to me. I am now a *Tufuga ta Tatau*, a traditional Samoan Tattoo master, after working with Su‘a Lafaele Suluape for almost seven years as his apprentice. My ability to work with others is very important to me. I embrace and help to manage the ancestral and sacred art forms of Tatau and Siapo; they are unique and meaningful to our culture and I am honoured to be a part of this work.

Hélène Guiot

Hélène Guiot is a PhD ethnoarchaeologist, teaches Oceanian arts at INALCO and is an associate member of laboratory Patrimoine Locaux (MNHN-IRD). Her research combines two main topics: technology (skills and materiality) and local conceptions about insularity. She studies Polynesian canoes, barkcloth, sculptures and matting. She works with European and Pacific museums to document ethnographic collections and to organise exhibitions to promote the value of Oceanian cultural heritage. She is also committed to the development of cultural programmes in order to offer access to knowledge about Oceanian cultures.

She edited the book *Vivre la Mer. Expressions Océaniennes de l'Insularité* (PUR-CIM, 2013) and is author of the documentary *Paroles de Tapa* (Société des Océanistes, 2015).

Adrienne L. Kaeppler

Adrienne L. Kaeppler is Curator of Oceanic Ethnology at the Smithsonian Institution, Washington, DC. Her BA, MA, and PhD are from the Anthropology Department at the University of Hawai'i. She was an anthropologist at the Bishop Museum, Honolulu, where she was involved with barkcloth since the 1970s. Moving to the Smithsonian Institution in 1980, she worked with the Conservation Department to provide stabilisation, conservation, documentation and access to the large barkcloth collection, culminating in a four-year Barkcloth project on the US Exploring Expedition collection, which is the predecessor of the Glasgow project. Her overall ethnographic focus is on social structure and the arts, including the visual arts, poetry, music, and dance. She has published widely on these subjects, as well as collections made during the voyages of Captain Cook and the United States Exploring Expedition.

Beth Knight

Beth Knight became a freelance textile conservator in Washington, DC after completing an Andrew W. Mellon Fellowship in Textile Conservation at the National Museum of the American Indian. She is currently a contract textile conservator at the National Museum of American History. She received an MPhil in Textile Conservation from the Centre for Textile Conservation, University of Glasgow (2017) and a BA in Art Conservation and Art History from the University of Delaware (2014). Her special research interests include the characterisation and removal of rust stains on organic materials. She is currently an Intern and Fellow Coordinator for the Washington Conservation Guild.

Frances Lennard

Frances Lennard is Professor of Textile Conservation at the University of Glasgow and was director of the Centre for Textile Conservation and Technical Art History until 2020. Her research interests focus on conservation approaches and methodologies and she is particularly interested in interdisciplinary research, working across arts, humanities and sciences. She is the co-editor of *Tapestry Conservation: Principles and Practice*, with Maria Hayward and *Textile Conservation: Advances in Practice*, with Patricia Ewer. She was Principal Investigator of the research project, *Situating Pacific Barkcloth in Time and Place*.

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Billie Lythberg is Senior Research Fellow at The University of Auckland Business School, working at the junction of economics, anthropology, and history. She wrote her PhD on entrepreneurship in Tongan barkcloth making in Tonga and its diaspora. Since 2005, Billie has worked with Moana artists, academics and traditional knowledge holders to explore first exchanges between European and Moana peoples and their legacies. She co-edited *Artefacts of Encounter: Cook's Voyages, Colonial Collecting and Museum Histories* (University of Otago Press, 2016), and *Collecting in the South Sea: the Voyage of Bruni d'Entrecasteaux 1791-1794* (Sidestone Press, 2018), which can be read at sidestone.com

Regina (Reggie) Meredith Fitiao

Reggie Meredith is a Professor of the Arts, both contemporary and traditional. She is a fourth generation Siapo maker and learned from the late great Auntie Mary J. Pritchard. She is honoured to carry on the art form of Siapo making and ensures that it is being perpetuated by continuing to make it, teaching it in the classroom, and providing special workshops. Meredith worked with conservators at the Smithsonian National Museum of Natural History with the Samoan Tapa collection from the 1800s. Handling Siapo from the past has given her a renewed outlook on the ancestral art form.

Andy Mills

Andy Mills is curator for Archaeology and World Cultures at The Hunterian. He is a world art historian, ethnohistorian and anthropologist, with specialist interests in Oceanic art, collections provenance, missionary collecting, textiles, and arms and armour, among other things; he is the co-editor, with Tom Crowley, of *Weapons, Culture and the Anthropology Museum*. During the project *Situating Pacific Barkcloth in Time and Place*, Andy's research focused on historical change in the arts of Polynesian barkcloth, analysing the materials and processes of tapa making, and exploring the histories of barkcloth in the world's museums.

Mark Nesbitt

Mark Nesbitt is curator and senior research leader at the Economic Botany Collection, Royal Botanic Gardens, Kew. His interests are in long-term patterns of plant use by humans, and in the curation and repurposing of historic botanical collections. His current research foci include working with source communities in the Rio Negro region of the Amazon rainforest, tracing Kew's role in colonial networks of acquisition and dissemination, the study of materials including barkcloth, basketry and paper, and the long-term history of medicinal plants including quinine and aloe vera. He was co-editor of *Curating Biocultural Collections: A Handbook* (Kew, 2014).

Fuli Pereira

Fuli Pereira, Curator Pacific at Auckland War Memorial Museum is Tokelauan, born in Samoa and raised in Porirua, Wellington, Aotearoa New Zealand. I work to bring the knowledges and experiences of Pacific peoples in Aotearoa New Zealand to the fore; to bear witness to Pacific peoples' endurance and aspirations as reflected in the material culture created contemporaneously, and their stories and connections with the material culture in museum collections. That was the motivation for the Pacific Collections Access Project 2016-2019, and the central role of our Pacific elders in it. Publications include *Pacific Jewellery and Adornment* with R. Neich (AWMM and David Bateman, 2004), 'Arts Specific: Pacific People and New Zealand's Arts' in *Tangata o Le Moana: New Zealand and the People of the Pacific (*Te Papa Press, 2012).

Monique Pullan

Monique Pullan is a textiles and organic materials conservator. She has worked at the British Museum for over 25 years, where she is currently head of the organic materials conservation studio. She has developed a particular interest in barkcloth, having been fortunate to work on many pieces from the museum's Oceanic collections. Employing techniques drawn from textile and paper conservation she has explored treatments for cleaning and repair of barkcloth. She is keenly aware of the need to place museum conservation work within the expectations of indigenous owners, most recently working with Tahitian/Norfolk Islander barkcloth maker Pauline Reynolds.

Pauline Reynolds

Pauline Reynolds is a Norfolk Islander. She is a historian invested in thinking through how islanders can re-imagine, re-construct and re-write the accepted histories of their past in which they are marginalised. Pauline has researched and written widely on the subject of Tahitian and Pitcairn tapa, and also has her own tapa practice. She is currently completing a PhD by Creative Practice in Australia. She is interested in practice-led research and research-led practice. She has work held in the Museum of Archaeology and Anthropology, Cambridge collections.

Leone Samu Tui

Leone Samu Tui (Ngati Hāmoa, Ngati Kahungunu ki Wairarapa) is currently a graduate student in Pacific Studies at the University of Auckland. Her research interests include Pacific museum collections and digital cultural heritage. Between 2016 – 2019 she was a collection technician in the Pacific Collection Access Project (PCAP) at Tāmaki Paenga Hira Auckland War Memorial Museum. Her work with Auckland-based Pacific communities during this project drives her interest in developing museological practices informed by Pacific perspectives.

Lisa Schattenburg-Raymond

Lisa Schattenburg-Raymond is a Hawai‘i-born ethnobotanist with a passion for working in Hawaiian fibre arts. She is a lecturer in Hawaiian ethnobotany and Ma‘awe (Hawaiian fibre arts) at the University of Hawai‘i, Maui College. Lisa has a BS in Horticulture with a minor in ethnobotany from the University of Hawai‘i. Prior to teaching she was the Executive Director of the Maui Nui Botanical Gardens for ten years. She continues to work closely with the Gardens, giving annual workshops in kapa making and Hawaiian dyes. She is most fascinated with the kapa making process and dyes, and her research focuses on traditionally available Hawaiian materials and methods of the 18th and 19th centuries.

Allan Tuara

I am of Scots/Irish-Polynesian Heritage. I trained as a dental technician in Aotearoa New Zealand and worked for the Health Services in Aotearoa New Zealand and the Cook Islands. I have always been fascinated by the history and culture of my Māori (Polynesian) side. I try to encourage the revival of some of the almost forgotten cultural practices of my home island Mangaia. I am a keen environmentalist and conservationist and a great believer in the protection not only of our island’s culture, environment and biodiversity but also of our ‘mother home’, our planet.

Fanny Wonu Veys

Fanny Wonu Veys is Curator Oceania at the National Museum of World Cultures, a Dutch umbrella organisation comprising the Tropenmuseum, Amsterdam; Museum Volkenkunde, Leiden; the Afrika Museum, Berg en Dal; and the Wereldmuseum, Rotterdam. She has previously worked at the Museum of Archaeology and Anthropology in Cambridge (UK) (2004-2006, 2008-2009) and has held postdoctoral fellowships at the Metropolitan Museum of Art (New York) (2006-2007) and at the Musée du Quai Branly (Paris) (2007-2008). Her fieldwork sites include Aotearoa New Zealand (since 2000), Tonga (since 2003) and more recently Arnhem Land, Australia (since 2014). Her most recent single-authored book is *Unwrapping Tongan Barkcloth: Encounters, Creativity and Female Agency* (Bloomsbury, 2017).

Patricia Te Arapo Wallace

Dr Patricia Te Arapo Wallace (Ngati Porou) is an Adjunct Fellow in Aotahi School of Māori and Indigenous Studies at the University of Canterbury, Aotearoa New Zealand. Her PhD thesis (2002) entitled *Traditional Māori Dress: Rediscovering Forgotten Elements of Pre-1820 Practice* included early European images of Māori as a source of ethnographic data; she continues to research Māori textiles and traditional technology.

Introduction

Frances Lennard

Barkcloth, or tapa, is a material expression of identity throughout Oceania. A cloth made from the inner bark or bast of selected trees, it was used in Polynesia for all purposes: clothing, furnishings, bedding, ceremonial and sacred artefacts, until the introduction of woven cloth following European contact from the late 18th century onwards. It was a high status material, a principal unit of value across Polynesia; the earliest museum collections derive from presentation bales of fine white cloth from the Cook voyages of the second half of the 18th century, some of the first encounters between Pacific and European peoples. Barkcloth remains a culturally significant practice across the Pacific today; the skill of making tapa has been reintroduced into some island groups, such as Hawai‘i, but in others, such as Tonga, production has been continuous and it has continued to play an important social role. Tapa can be considered both an art and a craft; as a medium it demonstrates supreme artistic creativity and beauty and it is also an expression of cultural significance which springs from the skilled use of materials in the creation of functional artefacts. But while the artistic quality is clear to all who view tapa, the intricate and diverse skills of making it are not always so apparent. This volume highlights some of the less readily accessible but equally significant practices and materials used to create this unique cloth and to fit it to a variety of purposes; the more we learned about tapa, the greater our respect for its makers.

The terms barkcloth and tapa are used interchangeably in this volume; the word tapa is widely used to mean barkcloth from the Pacific. As Veys discusses in Chapter 11, the Dutch explorers Schouten and LeMaire saw Tongans wearing tapa cloth in 1616, and inferred it to be made of tree bast. However, it would be more than another 150 years before the fabric's manufacture was observed and described in text, or samples of it were collected to be taken to Europe, at Tahiti in the Society Islands during James Cook's first voyage in 1769 (Parkinson, 1773; Banks, 1962; Beaglehole, 1969). Primary source accounts of manufacture, and descriptions of both fabric plants and colourants, rapidly increased in number over the remainder of the 18th and the 19th centuries as Western exploratory voyages, whalers, merchant ships, colonists and colonial officials became more frequent visitors to Oceania (see Dening, 2004, and, as a representative example, Martin, 1818). Many early accounts of tapa making take the form of very brief synopses within short texts outlining the 'manners and customs' of a particular Polynesian society. It is no longer clear to what extent some of these sources relied upon direct observation of artists at work, or to local explanations imperfectly translated by European visitors, or how much they were based on secondary historical harvesting of the fairly detailed early accounts made by the Cook voyagers and others. This uncertainty was instrumental in our decision to undertake the project leading to this volume: we gradually became aware that little that has been written about tapa can be taken as certain. Polynesian barkcloth manufacture was under threat, and ultimately in decline, throughout the 19th century as western traders flooded the region with cheap cottons and woollens. Christian missionaries pursued a programme of acculturating Polynesian dress to European conventions of modesty from 1797 onwards (*e.g.* Wilson, 1799; Pitman, 1836). Nevertheless, missionary writers offer an important body of historical literature, and often took an interest in local craft, and botany, where this had been absent before (see Pitman, 1836; Wyatt Gill, 1892).

Our most detailed historical sources are those explicitly anthropological, ethnohistorical and ethnobotanical accounts of the 20th century. Many of these ethnographies were written by Polynesian scholars themselves, some immediately before practical barkcloth manufacture was discontinued in the nations they focused on (*e.g.* Henry, 1928; Hiroa, 1944; 1957; Tamahori, 1963; Pritchard 1984). The last 50 years of scholarship in Pacific art history have seen the publication of many regional and national surveys of artefacts in museum collections, creating a western-style 'canon' of Pacific art, and greatly increasing the accuracy of cultural attributions made in museums around the world (Kaeppler, 1978a; Neich and Pendergrast, 1997; Kaeppler, 2011). This period began with the publication of Simon Kooijman's landmark work *Tapa in Polynesia* (1972), arguably the most important single work in the field. In the last ten years, there has been greater emphasis on producing a synthesis of art historical and contemporary art practice approaches, such as the proceedings of a symposium which accompanied a major exhibition of barkcloth at Cologne's Rautenstrauch-Joest-Museum in 2013-2014 (Mesenhöller and Stauffer, 2015), and Michel Charleux's major survey of 2017.

Therefore, unlike most previous work, this volume approaches barkcloth from a specifically material perspective, closely examining objects themselves as both fabrics and plant products to ask, 'What do the objects themselves tell us?' It is based on a research project, *Situating Pacific Barkcloth in Time and Place*, based at the University of Glasgow in 2016-20, which drew upon the historic barkcloth collections of The Hunterian, University of Glasgow, and the Economic Botany Collection (EBC) at the Royal Botanic Gardens, Kew in London. The collections of the National Museum of Natural History, Smithsonian Institution in Washington, DC, USA, formed a valuable further reference. Collaboration with contemporary barkcloth makers and local plant experts in the Pacific, particularly fieldwork in Hawai'i, the Cook Islands, Samoa and Tahiti, was key to the research. This volume, like the project, also considers the value of barkcloth artefacts to both contemporary communities and historic collections.

The project was based at the University of Glasgow's Centre for Textile Conservation and Technical Art History and demonstrates the ability of conservation to be a bridge between arts, sciences and humanities; Chapter 22 develops this theme. The conservation component of the project aimed to preserve both the cloths themselves and also their intangible qualities, and to that end working with Pacific communities was essential. In the conservation field, and in the museum sector more broadly as Chapter 20 shows, we have become more active in recent years in collaborating with those who represent the makers of the objects we treat, but this is a developing field and we are still working towards stronger relationships between those who care for Pacific cultural heritage both inside and outside museums. The reconciliation of different systems of knowledge production is an ongoing responsibility. It was of course recognised during the project that a large part of the tapa in the historic collections which formed a focus for the research is no longer in the Pacific, with large collections in museums in Europe and North America, though the Bernice Pauahi Bishop Museum in Hawai'i has one of the largest collections in the world, and museums in Aotearoa New Zealand and Australia are also well represented. While this is often painful for the Pacific practitioners and scholars who are the descendants of the makers of these pieces, it was acknowledged in the course of the research that this situation has at least resulted in the survival of many historic pieces around the world that would otherwise have been lost, and has contributed to a greater understanding of the significance of this material beyond the Pacific.

The project used diverse methodologies to explore the cloths' materiality, drawing on the disciplines of Pacific art history, technical art history, anthropology, provenance research, materials science and conservation. Examining a large number of cloths was integral to this process, enabling evidence from the objects themselves to be interrogated statistically, and in the light of historical theory. This interdisciplinary bridging of quantitative and qualitative investigation methods, while often challenging, gave us new insights into the materials and techniques of making. In the history of western art, the relatively new discipline of technical art history contributes information on materials and making to our broader stylistic and contextual understanding of an artwork. The field of Pacific art history has developed differently and is rooted instead in the discipline of anthropology, traditionally leading to a greater historical focus on the style and design of artworks and their cultural significance, rather than how they were made; for example the materials and tools are rarely discussed although this is more common in western art history. However, here, a close scrutiny of evidence of making, for example matching the number of grooves in barkcloth beaters to the cloths themselves, proved extremely useful for confirming the attribution of cloths to particular island groups (see Chapter 7 for more information on beaters). The value of commonly used conservation and scientific techniques was clearly demonstrated, such as the use of low-level magnification to gain a more detailed view of the relationship between cloth and colourant, while the examination of small samples in cross section, usually used for the analysis of paintings, revealed barkcloth in new detail. This interdisciplinary methodology gave us new information about this unique material's manufacture, demonstrated clear regional and chronological trends and showed how the employment of different materials and processes affected the nature and use of the finished fabric.

This detailed object-based research set out to question received wisdom and intuitive understanding – for example, does the material evidence confirm or contradict the historic record, is it possible to identify barkcloth fibres and colourants accurately by eye and by touch? While results were not always conclusive, they did give new insights. While the feel of barkcloth is often as important as visual clues in deciphering its material and manufacture, it became clear, for example, that visual and textural differences in the cloths are often more dependent on the processing method than the fibre type. Tapa collections in western museums are often labelled 'paper mulberry' (*Broussonetia* *papyrifera*) almost by default, but research showed that breadfruit (*Artocarpus altilis*) was another significant tapa fibre whose use may often have been overlooked. Another area of investigation was the materials used to make tapa colourants. Early travellers recorded a large range of plants being used to make barkcloth dyes and pigments – up to 70 species of dye plants have been mentioned in Hawai'i alone – while Banks describes *mati* as the principal red dye of the Tahitian region. In fact analysis of the cloths found only a small number of colourants: turmeric (*Curcuma longa*), *noni* (*Morinda citrifolia*), madder (*Rubia tinctorum*), tree tannins and inorganic iron oxide pigments; mati was not found (Flowers, Smith and Brunton, 2019). Interestingly, turmeric could be detected on cloths even when it had faded to the point of invisibility. Research on the British Museum (Tamburini et al., 2019) and National Museum of Scotland collections gave the same results on what is overall a large data set. This information challenges our understanding of historic texts and is not easily explained, though we should of course remember that cloths in European collections are a vanishingly small sample of those made in Polynesia in that period, and that they were collected in particular places at particular times. We have looked at very few cloths from the region and analysed even fewer. Nonetheless, this result demonstrates that the historical literature needs to be treated critically, like any other source. The research also showed that contemporary barkcloth practice cannot be used uncritically as a guide for understanding artefacts made in the past – analytical investigation of historic and contemporary materials was not always corroborative – confirming the value of an interdisciplinary approach. This volume does not report in detail on the scientific and conservation research which is published elsewhere, but the project also established new and improved methods for identifying the plants used (Smith, Holmes-Smith and Lennard, 2019) and new developments in conservation techniques (Tamura, forthcoming).

Although this volume touches on barkcloth from all parts of Oceania, the main focus is on Polynesia, because of the remarkable diversity in manufacturing and style encompassed within Polynesian tapa, which is well represented in the small but diverse collections at The Hunterian and Kew. The major part, or two-thirds, of The Hunterian's collection is from Tahiti and Hawai'i with the remaining third scattered more broadly across the region, while the Kew collection is more evenly distributed across Polynesia. While we acknowledge the contested nature of the terms widely used to divide Oceania into different areas, Polynesia, Melanesia and Micronesia, we have employed the commonly used term Polynesia to describe the islands largely situated in a rough triangle between Hawai'i, Rapa Nui and Aotearoa New Zealand (see map of Oceania on p.25). The chronological focus of the book is on a period of just over 100 years with the earliest cloths in the two collections originating from the Cook voyages in the 1760s and the latest (apart from some more recent acquisitions of contemporary material at Kew) collected in the 1880s.

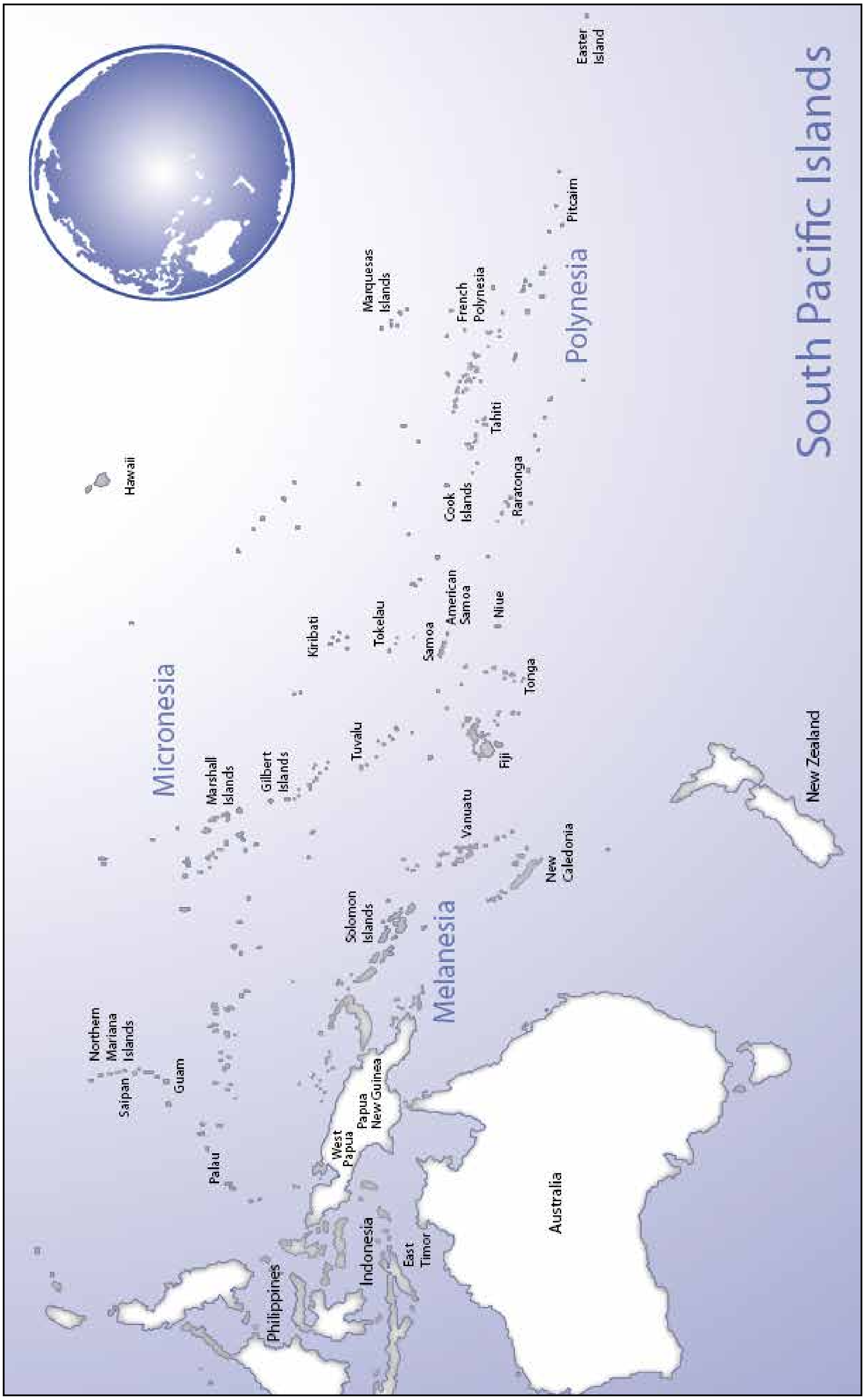
This volume is divided into three parts and is written by researchers in Pacific barkcloth who worked directly, indirectly or in loose affiliation with the *Situating Pacific Barkcloth* project. The authors include academics, curators, conservators and makers of barkcloth, reflecting the interdisciplinary nature of the project. The range of perspectives presented here, and the collaborative nature of much of the reported research, demonstrates how the interplay between text, object and plant-based studies can give new insights. Part I, *Tapa as Fabric: Bast and Colourants* contains technical investigations of the plants and other materials and the processes used to make and decorate barkcloth. The chapters in this section are united by the diverse range of methodologies used to interrogate barkcloth production: fieldwork, making, research of historic sources and text records alongside the study of historic objects. Mills, the project's historical researcher, presents his detailed findings, informed by fieldwork in the Pacific, on the species used to make tapa in Polynesia (Chapter 1) and on the discrete stages of making tapa – these have common elements in different island groups but are not universally applied across the region (Chapter 2). Austin Dennehy, Chapman Mason and Kaeppler also undertook fieldwork in the Cook Islands and Tahiti and experimented with tapa making as part of the project; their investigation, reported in Chapter 3, has helped to develop our understanding of the use of breadfruit and its relationship with paper mulberry as a tapa material in Eastern Polynesia. Schattenburg-Raymond, an ethnobotanist and fibre arts practitioner, has been researching the lost arts of *kapa* making in Hawai'i for many years and her combination of experimental making with textual research has yielded extraordinary insights into the kapa making processes formerly used (Chapter 4) and the range of colourants unique to these islands (Chapter 6). Mills also experimented with Mangaian colleagues, Tuara and Nooroa, in the Cook Islands to cast light on traditional Central Polynesian colourants (Chapter 5).

Part II, *Understanding Tapa in Time and Place* considers barkcloth from different regions of Polynesia and ranges in time from the late 18th century to the present day, highlighting differences in making practice (and in terminology). This section moves beyond the physical processes of making to put tapa in context and to show how different forms of manufacture are linked to its practical uses and symbolic associations. Mills begins the section by providing a historical overview, a synthesis of chronological developments in the region over the last three millennia (Chapter 7). Kaeppler's long career in tapa research, her extensive travels in the region and her contacts with tapa practitioners and users have given her an extensive knowledge of tapa production over time; her increasing interest in uncovering the materials and techniques used in objects in the Smithsonian collections led to her role as Co-Investigator on the *Situating Pacific Barkcloth* project. Here she writes about her long involvement with tapa makers and tapa making on Tonga in Chapter 8 and explores tapa colourants in Western Polynesia in Chapter 9. The focus on Tonga, an important centre of large-scale tapa production with a continuous tradition of making, is expanded by Lythberg – who examines recent developments on Tonga from the perspective of Tamahori's classic 1963 research (Chapter 10) – and by Veys, who contextualises this study by considering the colours of Tongan barkcloth and their meanings (Chapter 11). In two regional studies, Guiot discusses the techniques and significance of tapa from Wallis ('Uvea) and Futuna (Chapter 12), while Wallace reports on her novel research into the lesser known history of barkcloth in Aotearoa New Zealand (Chapter 13). This section moves up to date in Chapter 14 where Reynolds and Clarkson, two of the 'Ahu Sistas, describe how their work has reclaimed a place in history for their ancestors, the women of Pitcairn Island, and how this has informed their contemporary artwork. In the final chapter of this section (Chapter 15), Gillies and Burrows, contemporary artists from Aotearoa New Zealand, describe how their Tongan roots lie at the heart of their present day art practice and demonstrate the significance of tapa for them today.

This theme is developed in Part III, *Tapa in Collections and the Community*. This section moves beyond the cloths themselves to consider the value of tapa in historic collections and its meaning for contemporary Pacific communities. It begins with accounts of the three historic collections at the core of the project. A considerable amount of provenance research was necessary for Mills to gain an understanding of The Hunterian's significant collection and its donors; its rather tantalising nature was a starting point for the research. The propensity of collectors to cut up cloths has resulted in an unusual situation where parts of the same original cloth can be found in different western museums; this phenomenon provides a valuable key to provenance research and its significance for understanding the collection is explained here (Chapter 16). The Kew collection is very different from The Hunterian's, with a rich context provided by the botanists, naval officers and missionaries who donated it to the institution. The project prompted Nesbitt, also a Co-Investigator on the project, to uncover more information on the donors and their collections, in collaboration with Curtis and Mills, and to reassess the value of the collection for research (Chapter 17). Alongside these accounts, Kaeppler presents an overview of the Smithsonian's barkcloth collections, focusing on those from Polynesia and particularly the US Exploring Expedition collection which she has researched in depth and which was another starting point for the research (Chapter 18).

The value of such historic collections is explored in two accounts of projects which successfully engaged contemporary Pacific communities with this tangible heritage. In Chapter 19, Christophe explains the value for Hawaiian kapa makers in engaging with artefacts made by their ancestors and now housed in the Bernice Pauahi Bishop Museum, during a workshop arranged as part of the *Situating Pacific Barkcloth* project. Pereira and Samu Tui describe the Pacific Collections Access Project at the Auckland War Memorial Museum, a hugely successful project which hosted around 7,000 visitors from the local Pacific communities to engage with museum collections, to their mutual benefit (Chapter 20). This ongoing community engagement encouraged the *Situating Pacific Barkcloth* team to explore tapa making with contemporary artists and practitioners in a workshop held at the museum in 2017. Two final chapters consider the interaction of conservation with communities. While this volume does not cover technical conservation practice, it explains how liaison with Pacific scholars and practitioners has enhanced the conservation of barkcloth collections to the benefit of all museum visitors, whether intended for display, or for long-term storage and access. In Chapter 21 Pullan describes the importance of discussion with stakeholders from Pacific Island communities for making appropriate decisions about the extent of conservation treatment for the display of tapa at the British Museum, while Lennard et al. (Chapter 22) consider the role of conservation more broadly, in preserving both the physical object and its wider value.

Plants, the source of the fibres, dyes, oils and other materials that make up barkcloth, were a constant in the project. Understanding what was available – and how that changed – over the last 250 years has demanded a complex triangulation of data sources: historic texts, recent ethnobotanical studies, and the knowledge of plant species and distribution captured in collections, databases and published floras and checklists. We drew heavily on these floristic resources, greatly benefitting from the online availability of herbarium specimens through the *Consortium of Pacific Herbaria* (https://serv.biokic.asu.edu/pacific/portal) and the *Global Biodiversity Information Facility* (https://www.gbif.org/), and the digitisation of key floras such as the *Manual of the Flowering Plants of Hawai'i* (Wagner et al., 1999) and the *Flore de la Polynésie française* (Florence, 1997). We were guided by the botanical expertise of makers and botanists during our relatively brief periods of fieldwork; large-scale botanical or ethnobotanical research fell outside the scope of our project.



Map of Oceania. Pacific Peoples' Partnership.

The book is underpinned by information on these plants used to make barkcloth across the Pacific, and we are grateful to Mark Nesbitt for ensuring botanical accuracy throughout this volume. Considerable effort has gone into resolving ambiguities and standardising plant names in this book, and we hope it helps build bridges between technical botanical resources, and makers and curators working with barkcloth plants and raw materials. In particular the text is supported by a range of Plant Profiles, in which Nesbitt provides core botanical information on a group of 17 key plants used as barkcloth fibres and colourants, together with images of the plants and of herbarium specimens. These portraits provide a summary of key information on the plants, bridging the discussion in the various chapters. They are based on multiple sources, including Art Whistler's classic book *Plants of the Canoe People: an Ethnobotanical Voyage through Polynesia* (2009), and the valuable species profiles available online at agroforestry.org (Elevitch, 2006). The ethnobotanical work of W. Arthur Whistler (1944-2020) was a foundational resource and inspiration for us throughout the project. The botanical names used throughout the book are those most widely established in regional works such as Whistler (2009). In some cases the accepted name has recently changed; we note these as 'now known as' at the first time of use. Author names are not given for plant species in the main text, except in a few cases where ambiguity would result from homonyms.

The project website (accessed on the University of Glasgow website at https://tapa.gla.ac.uk) should be seen as a companion to this volume. It contains complementary resources, including images and information on plants used as barkcloth fibres and colourants, images and information relating to the Hunterian and Kew EBC barkcloth collections, links to other tapa collections referred to during the research, bibliographies and more details of the scientific and conservation aspects of the project.

PART I

TAPA AS FABRIC: BAST AND COLOURANTS

1

The Procurement, Cultural Value and Fabric Characteristics of Polynesian Tapa Species

Andy Mills

Most of the historical literature on the art of Polynesian tapa describes its production and features when made with the bast of *Broussonetia papyrifera* (paper mulberry). While this was, and remains, the most widely used tapa species, several other trees and plants were also used to make barkcloth in various parts of Polynesia during the 19th century. The world's museum collections of Oceanic art contain a significant minority of tapa cloths made from other species, although art historians and curators have fared poorly at differentiating and describing their distinctive material characteristics. Such work has been greatly hindered by a lack of correctly provenanced and described museum collections, and a systematic over-simplification of species diversity: it is commonplace to find every tapa in a western museum described in its documentation as made from paper mulberry bast on assumption alone. Here I discuss the plants, the cloth made from them, and the historical use and cultural significance of each. Uncertainties about identifying the species used to make different tapa cloths largely emerge from the fact that several of them are closely related genetically: paper mulberry, breadfruit (*Artocarpus altilis*) and banyan (*Ficus prolixa*) – the three principal tapa species of Oceania – are all members of the Moraceae (fig) family, as are other Oceanic tapa species described below, and the principal barkcloth species of Africa, Indonesia and Amazonia (Aragon, 1990; Boom, 1996: 53; Worden, 2016). In a very real sense, the global story of barkcloth is primarily a story of the Moraceae family.[1] All Moraceae species produce latex in their bast as a defence mechanism against insect pests, and distribute it throughout the bast layer by means of a net-like system of interconnected vessel cells with thickened walls termed *articulated laticifers* (Wilmot-Dear, 2015a) (Figure 1.1a). It remains to be shown experimentally, but it may be these structural characteristics, or the presence and mechanical manipulation of

1 Those other Moraceae species used for barkcloth elsewhere in the world are *Ficus natalensis* of Africa; *Antiaris toxicaria* (which was used in Africa, Indonesia and Oceania as far east as the Santa Cruz islands); and *Brosimum utile* and numerous other fig species of the South and Central American lowlands.

in: F. Lennard & A. Mills (eds) 2020: *Material Approaches to Polynesian Barkcloth. Cloth, Collections, Communities*, Sidestone Press (Leiden), pp. 29-42.

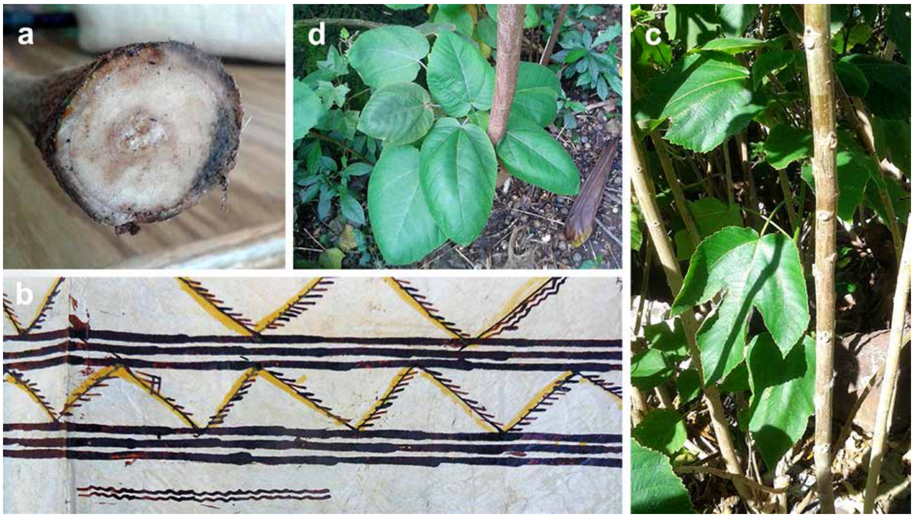


Figure 1.1. a) Cut stem of 18-month old *Broussonetia papyrifera*, showing the clear demarcation between wood and bast. b) Detail of 1850s Niuean *hiapo* (The Hunterian, GLAHM: E.417/2) showing the remarkable whiteness achievable with paper mulberry. c) *Broussonetia papyrifera* of the wauke manalima type growing on Oahu. d) *Broussonetia papyrifera* of the wauke po'a'aha type.

their latex, which allows the bast of Moraceae species to be removed in a single sheet that remains coherent throughout the transformations of beating.

Most of the other plants used for Pacific barkcloth are Hawaiian species of the Urticaceae (nettle) family: *māmaki* (*Pipturus albidus*), *'oloa* (*Neraudia melastomifolia*) and *akolea* (*Boehmeria grandis*). Nettles have long been exploited worldwide for their long and immensely strong bast fibres (Wilmot-Dear, 2015b).[2] These endemic Hawaiian species are discussed in depth by Schattenburg-Raymond (Chapter 4), as is another endemic species in the Thymelaeaceae family, *Wikstroemia uva-ursi* (Plant Profile 6), and here I will only discuss Hawaiian data for those species also found elsewhere. This includes two well-known but long-discounted species of the Malvaceae (mallow) family, *Hibiscus tiliaceus* and *Thespesia populnea*. Later in the paper, I also discuss species which have been (at one time or another) described as providing tapa, but for which the evidence is poor or for which the consensus is that they should be discounted. In this way, I hope to offer the reader an accessible overview of the resource management and fabric characteristics of Polynesian tapa plants.

Broussonetia papyrifera, the paper mulberry

Although Gardiner (1898: 410) remarked that it was neither grown nor used on Rotuma, and it seems that the Tuamotu Archipelago lacked the salt-free land to support it, around the year 1800 paper mulberry was otherwise under cultivation throughout Polynesia (Plant Profile 1). It was the region's most widespread tapa species, but it is important to

2 Whether Urticaceae can produce a true barkcloth alone or must be mixed with other bast to provide their fibres a cohesive matrix, is for debate.

note that it was not always the most abundant or heavily used resource locally, as I discuss concerning *Artocarpus* below. As Kooijman (1972: 178) mentions for the Marquesas Islands, it was considered everywhere (regardless of its availability) to furnish the best cloth; by 'best' was meant the softest, smoothest, whitest and most prestigious. Two points require clarification: first, paper mulberry provides an extremely white cloth (Figure 1.1b), and all historical Polynesian barkcloth of a pale cream or lighter colour – *unless* made in the Society Islands – essentially must be *Broussonetia*. As I discuss below, some Society Islands resources complicate identification, and there is therefore uncertainty in that case. Second, *Broussonetia*'s foremost prestige value should be understood as *secular* only: while paper mulberry cloth did fulfil numerous sacred functions and held first place in economic and ergonomic judgments of value, other materials frequently superseded it in spiritual significance. However, where a choice could be made,[3] it was always the fabric of chiefly gifting, and everyday elite dress. Demand for it often exceeded supply, the lower echelons of society often went without and wore fibre garments, or relied on the *subjectively* inferior tapa species listed below.

Recent analysis of paper mulberry plants collected throughout Polynesia has shown that there is virtually no genetic diversity in its population (Seelenfreund et al., 2010). It appears that the entire Polynesian stock of paper mulberry has been transmitted from its ultimate point of origin by vegetative reproduction (taking cuttings) from clones of its female ancestor plant.[4] By comparing female Polynesian clones to sexually propagated varieties of *Broussonetia papyrifera* in its native Asia, Seelenfreund et al. (2010) show that the ancestor plant was extracted from a population common to Taiwan and the southern Philippines. The modern Hawaiian *Broussonetia* population is the only exception to this, as it appears that Chinese or Japanese settlers introduced their own mixed-sex *Broussonetia* population (for paper-making) during the 19th century, the males of which have hybridised with local female clones since that time. It therefore seems that the Austronesian-speaking peoples brought paper mulberry with them when they arrived in Western Polynesia 3,100 years ago or more (Whistler, 2009).[5]

The vegetative propagation of genetically identical female *Broussonetia* trees raises important questions about the fact that, both historically and currently, more than one named variety has been cultivated in several parts of Polynesia. For example, Tonga has *lau mahaehae* with lobed, entire leaves and slightly thicker bast, and *lau ma'opa'opa* with rounder, slightly serrate leaves and thinner bast (Veys, 2017: 30-31). Modern Hawaiian *kapa* makers generally recognise two varieties of *wauke*: the *wauke manalima* (Figure 1.1c) and the *wauke po'a'aha* (Figure 1.1d), which essentially correspond in character to the

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3 Futuna, 'Uvea, Rapa Nui and Aotearoa New Zealand had only *Broussonetia papyrifera*; Rotuma had none and seems to have relied on breadfruit bast (Kooijman, 1972: passim).

4 *Broussonetia papyrifera* is a dioecious plant species; its female and male sexual parts are carried in separate flowers, and only one sex of flower occurs on any given individual tree. In this way, it is appropriate to speak of male and female plants in such species (Capon, 2010).

5 Although clonal distribution means that paper mulberry trees in Polynesia are genetically very similar, recent work by Olivares et al. (2019) has detected some regional structuring of populations, mapping on to potential routes of distribution by prehistoric Polynesians. Further work remains to be done on characterising locally variant forms of the plant recognised by makers. It remains at least possible that *Broussonetia* was not the primary tapa plant of ancient Polynesia; a possibility which may seem more plausible when I discuss breadfruit below – a plant dominant on 19th-century Rotuma, in the Marquesas Islands, and heavily used in Eastern Polynesia.

two Tongan varieties listed above – and which are said to prefer different terrains and rainfall levels (Kooijman, 1972: 100). However, in Hawai‘i it is wauke po‘a‘aha which is said to provide the thicker, whiter bast. (Also see Chapter 4 where Schattenburg-Raymond identifies three distinct Hawaiian varieties.) The Cook Islands had two varieties, *aute* and *‘anga* (Hiroa, 1944: 67), although these may have been merely differences in dialect. Ellis (1829, I: 179) mentions ‘several’ varieties of aute in Tahiti without providing more details. On Mangareva, Kooijman (1972) tells us, a distinction was made between cultivated (*pure*) and ‘naturalised’ (*eute*) *Broussonetia,* as well as the cloths made from them. As female *Broussonetia* clones cannot reproduce sexually due to the absence of males mentioned above, it cannot have truly naturalised in Polynesia (Whistler, 2009). This suggests, therefore, the perception of a qualitative difference between fabrics produced from younger trees grown on fertilised, tended soils and older trees lingering on depleted soils in abandoned gardens.

How are we to reconcile these two divergent conceptions of *Broussonetia*’s nature – that of its Polynesian cultivators on the one hand, and of the plant geneticists on the other? Casting an eye over even a few *Broussonetia* plants will show that it has a particularly variable growth habit, and (like many other species) its leaves vary in shape over a single stem. Discussion with several growers on Oahu in 2017 revealed that plants classified as one variety, when stem cuttings were taken and planted up in a different location under different environmental conditions, grew to exhibit the traits of the other variety (cf Veys, 2017: 31). This is genetically inconsistent and therefore such traditional classifications cannot be horticultural cultivars. Rather, they must reflect the growth conditions of *Broussonetia.* Moreover, Kooijman (1972: 100) suggests that, in the Kona district of Hawai‘i island itself, the term po‘a‘aha corresponded not to a variety but the bast from its third harvesting cycle (see below). Henceforth, I would therefore urge tapa researchers to explore the identification of the trees’ generative environmental factors, the source plantation’s stage of cultivation, the resultant characteristics of harvested bast, and its correlation to specific cloth-making projects.

As there is recent renewed interest in growing and using *Broussonetia* in parts of Polynesia where it died out during the 20th century, and its increasingly short supply is one of the greatest obstacles to the renaissance of the art form everywhere, it is useful to offer some notes on its historical garden cultivation. The paper mulberry is an adaptable and hardy plant in the tropics, and grows happily in a range of lowland habitats on comparatively level, well-drained and alkaline soils.[6] Forster (1778: 445) described Tahitian aute plantations as ring-ditched to keep the pigs out and fertilised with shells, while Handy (1940: 197) describes a top-dressing of leaf mould in Hawai‘i, again reiterating the importance of a free-draining soil. New *Broussonetia* plantations were usually laid out in the early rainy season (January-March) to keep the cuttings moist until they had properly rooted. Ellis (1829: 168-172) provides useful details on 30cm slips (that is, stem cuttings comprising at least two nodes and one upper leaf) being taken from the ‘parent’ plants. Kooijman (1972: 100) remarks that these slips were planted out in the new plantation

6 Although Neich and Pendergrast (1997b: 13) argued that the plant will not grow on the low, sandy islands of central Tonga (and that is why, they argue, Ha‘apai became famous for exporting its fine pandanus mats), in 1777 Anderson remarked on seeing several large and fine hiapo plantations on Lifuka (Beaglehole, 1969, III: 906). Veys (2017: 32) also discusses Ha‘apai as a noted exporter of bast in historical Tonga.

(or a rooting bed) the following day and protected from wind damage with little banana-leaf screens or collars until well-established. Wind was a major cause of *Broussonetia*'s short supply on Rapa Nui, where it was planted in small dry-stone enclosures, and the plant must be viewed as vulnerable in this regard (Metraux, 1940: 157-159). A healthy *Broussonetia* sapling will send out a radial system of underground runners several metres distant during its second year of growth, which root and throw up a new trunk. In most places (such as both Tonga and Fiji today) these satellite trunks are an important source of young saplings for laying out new plantations (Tamahori, 1963: 16-20). Reported planting distances between rows varied from 45cm to 60cm, with a similar spacing between plants in each row (Kooijman, 1972: 9, 299; Abbott, 1992: 50-53). While most accounts describe *Broussonetia* gardens as kept neat and weed-free, the plant's preference for dry feet meant that it could be intercropped with yams or fruit trees in Tonga, with sugar cane or bananas in Hawai'i (Ellis, 1853, IV: 109; Tamahori, 1963: 16-17). All accounts of the crop's management emphasise regular weeding and removal of the side-shoots to ensure a knot-free bast.[7] In general, three bast harvesting cycles are derived from each plantation before the ground is considered depleted and a new site found: the first harvest when the initial slips are ready for cutting; the second when the runners thrown out from them in the second year are themselves ready; and the third harvest when additional coppiced stems (up to three), which sprout from the initial root crown after its first cutting, have themselves matured. The secondary growth cycle of vigorous runners is preferred for providing new slips to transplant a garden (rather than making fabric), and the third harvest for a thicker, whiter bast – one assumes due to a mature root system.

There was seemingly considerable variation in the size at which paper mulberry was historically harvested. On Tongatapu in July 1777, James Anderson (Beaglehole, 1969, III: 905-906) estimated the width of a cut hiapo stem as 'four fingers', but this so diverges from all other accounts I think he can only have been referring to the circumference of the stripped bast layer. In Tahiti, both Morrison (1935: 160-161) and Wilson (1799: 369-370) remarked that *Broussonetia* saplings were harvested at 10-12 feet (3.5-4m) in height and 3 inches (7.5cm) in circumference – *i.e.* approximately 3-4cm in diameter. Hiroa (1944: 70) observed the harvesting diameter of *Broussonetia* in the Cook Islands as the width of a human thumb. Neich and Pendergrast's (1997b: 13) ethnographic account of Samoan *Broussonetia* harvesting describes the stems being cut after 10-14 months, at a diameter of 5cm with a clear trunk height of only 1m. The proportions of these sticks are surprising and perhaps suggest crown-pruning as a resource management technique in the area of Savai'i where their research was conducted, leading to a thicker, denser bast. Ellis (1853, IV: 109) also recorded this as a known management technique in Hawai'i for thickening the trunk. Hiroa (1957: 168-169) described Hawaiian *wauke* as harvested at ten feet (3.5m) in height and one inch (2.5cm) in diameter. His remark that this was at an age of 12-24 months *depending on the conditions* resolves those questions (discussed extensively by modern tapa makers and scholars) concerning the sapling's best harvesting age; various claims are made for one year, eighteen months, two or three years. All trees are individuals (even clones) and every stem's ripening to harvesting size is determined

7 This pruning only applies to the woody branching stems and not the leaf petioles. It is anecdotally reported that some modern growers remove all leaves on the main stem. This only inhibits photosynthesis and slows the growth, as the petioles produce no knots in the bast.

Figure 1.2. *Artocarpus altilis*, the breadfruit tree: a) A small breadfruit tree in its typical mixed-orchard setting. b) Aerial parts of the breadfruit, showing greenish-purple first year growth, grey second year growth, flower and fruit.

by its underlying soil, aspect, planting distances, water supply, development of the root network, and the significant differences in climate between islands. Moreover, as three harvesting cycles are described above, we should at any rate expect different harvests to come off each plantation at any time between 12 and 48 months or more after initial planting out.

Artocarpus altilis, the breadfruit tree

The extent of exploitation of *Artocarpus altilis* for tapa varied widely, particularly between Western and Eastern Polynesia (Plant Profile 2). Although under cultivation for food throughout Western Polynesia, there is scant evidence of its use for cloth-making in Fiji, ʻUvea, Futuna or Niue. According to Kooijman (1972: 283), however, it was the only available tapa species on Rotuma – although he was unable to locate any cloth in the world's museums reliably provenanced to Rotuma. Speaking of the Tongans, Mariner (Martin, 1817, II: 293) remarked: 'They make also an inferior kind of gnatoo of the bark of young breadfruit trees, which, however, is coarse and seldom worn, but is chiefly used for various purposes at funerals.' Ella (1898: 166) mentions that it was also used to make an inferior cloth in Samoa, although this contradicts George Turner's more experienced opinion (1861: 203) that *Broussonetia* was the only Samoan species commonly used.

In most Eastern Polynesian societies, *Artocarpus* cloth is well documented as holding an important place. That said, *Artocarpus* was seemingly absent from Rapa Nui in historical times (Metraux, 1940: 159). Equally, it cannot survive outside the tropics, and *Broussonetia* was relied upon in Aotearoa New Zealand (see Wallace, Chapter 13). While the production of *poʻulu* breadfruit cloth was well documented in Hawaiʻi, it occupied a weak tertiary level of significance behind *māmaki*, which itself comprises no more than 5% of kapa in museums (Hiroa, 1957). Perhaps one or two historic Hawaiian kapa per hundred are made of breadfruit, but as *Wikstroemia* cloth has some basic similarities of colour, attributions must be made cautiously. For the Cook Islands, Charles Pitman's (1836: 68) diary for October 1830 clearly indicates that breadfruit was used on Rarotonga to produce a 'short-lived' fabric. Hiroa (1944: 67) describes a 'greyish-brown' *tiputa* poncho of breadfruit from Atiu in the collections of the Bishop Museum (BPBM C2891). He (1944: 73-74) found that early 20th-century Mangaian tapa production *exclusively* employed breadfruit and suggested that Mangaia's *Broussonetia* plantations were pulled out during the last quarter of the 19th century to make way for cash crops. Nevertheless, a requirement for tapa in the production of Mangaia's 19th-century masquerade costumes led to breadfruit's continued use.[8]

In the remaining archipelagos of Eastern Polynesia – the Society Islands, Austral Islands, Marquesas Islands and Mangareva – we are on surer footing in one sense, and less sure in another. Kooijman (1972: 178-179) argues that it was a lack of level farmland in the Marquesas which rendered *Broussonetia* in such short supply, and meant both that breadfruit (*mei*) provided the majority of fabric, and that Marquesans generally wore less than other Polynesian nations (Handy, 1923: 161).[9] This may have been the case, but there was abundant horticultural land in the Society Islands, and an attentive reading of Forster (1778: 446) and Banks (1962: 353) suggests that the majority of ordinary cloth worn by 18th-century Tahitian *manahune* (commoners) was made from breadfruit. Whether this has been largely overlooked because a one-species *Broussonetia*-biased explanation was easiest, because Western observers were principally interested in elite clothing, or were interested in *Artocarpus* for its fruit alone, is unclear; probably something of each. In both the Society and Austral Islands, two distinct terms (*uru* and *maiore*) were applied to breadfruit trees, but it remains unclear whether they were designated varieties bred for food and cloth, or simply dialect variations. In the early 19th century there were at least 40 named varieties of breadfruit in the Society Islands alone (Kooijman, 1972: 9); probably more than a hundred across the whole of Polynesia. The work of systematically reconstructing their known characteristics and uses, however, is unfinished. Something clear from many sources cited here is that bast could be derived from two different parts of the tree: on one hand, the bast of immature saplings which naturally propagate under the canopy of their parent tree – a resource which was strongly analogous to *Broussonetia* saplings discussed above, and in no way inhibited the fruit yield. On the other hand, tapa could also be made from the second-year growth of the canopy; greenish-purple, waxy and flowering on their first year growth, in the second year branches develop a true bast and cortex which is usable for a few seasons before it develops the typical fissured grey cortex of mature breadfruit limbs (Wilmot-Dear, 2015a) (Figure 1.2).

Very little barkcloth in museum collections is positively identified as *Artocarpus.* Most sources describe *Artocarpus* cloth as coarser-textured than *Broussonetia*, and of a beige, light brown or grey colour. Diagnostically, Hiroa (1944: 67) argues that the ridges of an

8 Given Mangaia's considerable size, and formerly much greater population, Hiroa's explanation seems unlikely. Rather, I would suggest that *aute* simply ceased to be an important plant for Mangaians by the 1850s, and without people to propagate them from cuttings, the trees simply aged and died out. Happily, through the efforts of the Cook Islands Museum and the University of the South Pacific, the plant has been reintroduced to the island in the last ten years.

9 In Hawaiian mythological narratives recording the primordial period before the deity Maikoha's gift of wauke to humanity, breadfruit ('ulu) and māmaki (*Pipturus albidus*) are described as having been the principal species of kapa manufacture (Fornander, 1919; Beckwith, 1970: 98-100). Given that Hawai'i was first settled from the Marquesas, this may record an ancient memory of breadfruit having also been Hawai'i's principal fabric plant in the remote past.

Figure 1.3. Three manifestations of breadfruit tapa: a) An Aitutaki fabric showing classic brown ridges and beige furrows in the beater mark (Honolulu Museum of Art, 4821). b) Darker and lighter beige fibres in a Pitcairn Island rebeaten and rubbed breadfruit fabric (University of Aberdeen Museums, ABDUA 4007). c) Two layers of breadfruit fabric in different forms, the upper using a net-like method and beaten into a sheet constructed with a conventional fused method (Honolulu Museum of Art, 4828).

Artocarpus cloth's linear beater mark are darker than the lighter-coloured furrows – a situation which is generally reversed on beater-marked *Broussonetia* cloths in museum collections (Figures 1.3a and 1.3b). To this, I would add that an *Artocarpus* cloth often feels subjectively drier, and offers more friction to the touch, than paper mulberry. In more coarsely grooved examples, the darker ridges will often have a more cellulosic, scaled or fibrous appearance under a hand magnifier. Hiroa (1944: 73-74) generally describes *Artocarpus* as producing 'a good cloth' from the young branches and shoots of the tree. A key inference from this is that the formal differences between *Broussonetia* and *Artocarpus* cloths can be very subtle. So subtle, in fact, that I would suggest that many of the early Society Islands cloths in museum collections (and particularly *'ahufara* cloaks, which are often greyish-beige rather than white) are actually of *Artocarpus* rather than *Broussonetia* – although most have been documented as the latter for two centuries or more. Adding to this the fact that Ellis (1829: 174) describes Society Islands cloths made by mixing breadfruit and paper mulberry bast as 'of a light brown and sometimes fawnish colour', we must recognise that many Central Polynesian cloths are actually composites of the two species – both in adjacent layers beaten together, and in different areas across the cloth where smaller *Broussonetia* and *Artocarpus* pieces were fused together at their edges (Figure 1.3c). The relative use and proportions of each probably varied pragmatically due to availability, season, readiness for harvesting and the aims of the maker. Even the finest, whitest sun-bleached *hopu* cloth, Ellis (1829) describes only as 'made principally, and sometimes entirely, with the bark of the paper mulberry.' However, Kooijman (1972: 9) mentions one special variety of Tahitian breadfruit (the *puta* or *pu'upu'u*) which produced an extremely white, highly prized fabric known as *ahu pu'upu'u*; where Tahitian cloth is concerned, therefore, even extreme whiteness was no guarantee of a *Broussonetia* origin.

The very highest echelons of Tahitian society wore 'ahufara capes and tiputa ponchos made from the finest aerial shoots of breadfruit (Ellis, 1829: 168-170). Lythberg (2016: 207-209) has recently published an interesting discussion of one printed 'ahufara cloak of breadfruit in the collections of Cambridge University (MAA Z6048) which was gifted to the Reverend George Bennet of the London Missionary Society in the 1820s by Tamatoa Vahine, the 'queen' (*ari'i rahi*) of Raiatea. One of the few known breadfruit garments documented as the personal possession of a high-ranking Society Islands noble, this cloak's distinctive lattice-like surface texture reveals that the bast sheets have been first twisted into cords, then finger-woven into a rhomboidal-orientation net. Once created, this network was beaten flat into a continuous surface with a coarser sheet-constructed under-layer of the same material. The prominent darker brown fibre bundles (running longitudinally in the light beige mass of each cord) disappear and reappear at every second intersection, in a colour combination unique to *Artocarpus* wherever it is seen.

Ficus prolixa, the banyan

Those banyan trees which grow in Hawai'i and Aotearoa New Zealand today were introduced from Asia as ornamentals during the later 19th century, and the tree was formerly neither found nor used there, on Mangareva, or on Rapa Nui (Plant Profile 3). Both *Ficus prolixa*, and the related *Ficus obliqua* (the small-leaved fig) were the primary barkcloth species of Melanesia, making the physical traits of its cloth comparatively easy to identify and differentiate from other major Polynesian tapa species. It was the *Ficus obliqua* (*baka*) which provided a coarse stiff orange-brown cloth for Fijian commoners (Seemann, 1862: 313), and as both fig species are also to be found in Samoa and Tonga, it may be that Ella's (1898) mention of a *Ficus*-made cloth in Samoa was *Ficus obliqua* rather than *Ficus prolixa*. Nevertheless, the use of baka for *masi*-making may have been forgotten in Fiji by the early 20th century, as Parham (1939: 3) makes no mention of it. The *ovava* cloth of Niue must have been *Ficus prolixa*, however, as the *F. obliqua* is absent from that island (Kooijman, 1972: 286). Ovava was a tree of great spiritual significance in pre-Christian Tonga, as an abode of spirits and commonly the site of *malae* (ceremonial) precincts (Gifford, 1929) but documentary evidence is absent for ngatu being manufactured from it, and the same applies to 'Uvea, Futuna and Rotuma. *Ficus* use in Western Polynesia was therefore patchy, but it seems possible this was due to historical concerns of *tapu* or metaphysical restriction.

Turning to Eastern Polynesia, it was those same groups discussed above as heavy utilisers of breadfruit cloth, in which *Ficus prolixa* cloth saw prominent use: The Society Islands, Austral Islands, Cook Islands and Marquesas Islands. Apart from the Cook Islands (where it was seemingly just another useful material) banyan cloth had sacred and chiefly associations throughout this region. Even collections of tapa cloth from these island groups, however, rarely include banyan tapa, simply because there was so little of it, and it was very precious to local people. In his journal from the voyage of HMS *Endeavour*, Banks (1962: 353) wrote that, of the three main Tahitian species, it: 'is much the most rare…[and provides] a coarse harsh cloth of the colour of the deepest brown paper, which is the only one they have that at all resists water. It is much valued, the greatest quantity of it is perfumed and used by the most principal people as a Morning [sic] dress' – in

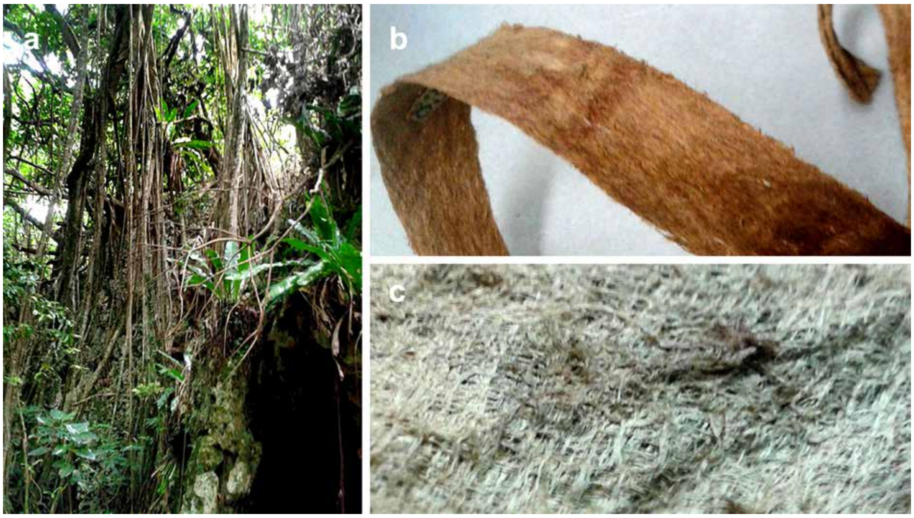

Figure 1.4. a) Aerial roots of *Ficus prolixa* growing on a cliff-face in central Mangaia, Cook Islands. b-c) *Ficus prolixa* bast in a late 19th-century New Guinea loincloth (University of Aberdeen Museums, ABDUA 1622): b) brown and fuzzy at the growing tip; c) grey and coarsely fibrous at the branch.

other words, *aoa* cloth was used for funeral observances.[10] Johann Reinhold Forster (1778: 386) remarked that the principal deity images of the Tahitian *marae (*ceremonial precinct*)* wore cloth of aoa, and Kooijman (1972: 10) interpreted its wearing by the upper classes as an indication of their divine status. Ellis (1829: 171-172) records that the aoa (or *ora*, or *oraa*) tree had a lunar origin – the moon's *mare,* or dark areas, were understood to be forests of banyan. It was a vital presence on marae precincts, where it was used as a suspension framework for human and other sacrifices after offering. He also remarks that it had close associations with the principal god of the 18th-century Society Islands, 'Oro. In such a light, its usage for mourning observances, and its restriction to highly *mana* persons, is congruent.

In the Marquesas Islands, aoa was fabricated into a cloth termed hiapo (a generic name for cloth further west), but its use was highly restricted to the *hami hiapo* loincloth of the priesthood and the eldest son in each generation of the extended kin-group – *i.e.* the male heir to senior rank (Handy, 1923: 79; Kooijman, 1972: 179, 189). That *Ficus prolixa* was therefore associated with the celestial otherworlds, and with the sanction of ancestral patrilineages, seems clear enough. We can recognise that the tree therefore possessed certain ritual qualities of an *axis mundi*, which in turn passed into the fabric manufactured from it. In contrast to this, Hiroa (1944: 74) has little to say about Cook Islands banyan cloth, other than it was brown, known as aoa like the tree itself, and produced (as everywhere) from the depending aerial roots (Figure 1.4). He remarks that it

10 The English term 'morning dress' (a formal dress code of the aristocracy, initially for horse-riding) did not arise until the early 19th century, so we can be sure that Banks here meant 'mourning dress'. Beaglehole (Banks, 1962: 353n7) was incorrect to take Banks to task for describing ora cloth as coarse and harsh in comparison to *Broussonetia*; it certainly is.

was worn only by commoners on Mangaia (and only at need) on account of its coarseness. Equally, there is no evidence that anything other than black-decorated white *Broussonetia* cloth was of spiritual significance on Rarotonga. In this regard, Cook Islands Māori seem to have viewed the aoa rather neutrally.

Other *Ficus* tapa species

A small range of other species are documented as employed for tapa production in Eastern Polynesia, but it is noticeable that all the species listed henceforth in this chapter were seemingly not discovered as (or deemed) cloth-worthy in Western Polynesia, where the number of species exploited was at its lowest. I discuss the additional Moraceae species here first. The use of bast from the *mati* tree (*Ficus tinctoria*; Plant Profile 13) to produce a high quality, extremely white cloth was documented in the Society Islands by Ellis (1853, I: 179-180).[11] On the basis of reproduction samples kindly supplied by the Smithsonian Institution, mati cloth is surprisingly like *Broussonetia* in its finished qualities. Nothing more exists in the historical documentation about it beyond that it *was* used, and it is perhaps likely to have been an alternative species when insufficient *Broussonetia* was available on its own, and a whiter cloth was desired than an *Artocarpus* blend could normally provide. The rubber tree (*Ficus elastica*) was introduced to the Cook Islands in the 19th century, and it has been anecdotally reported in recent decades that it too has been used to produce tapa cloth. Adrienne Kaeppler commissioned the production of rubber tapa samples in the Cooks in the last ten years, which may be found at the National Museum of Natural History, Washington, DC.[12] Like mati, it also produces a very good white cloth, but it need not concern us in relation to historical collections. *Ficus tinctoria*, however, must be considered one of a small set of species that could potentially be mistaken for *Broussonetia* in collections of Society Islands cloth.

Malvaceae tapa species

Two other Polynesian species, both belonging to the Malvaceae (mallow) family and familiar to scholars of Oceanic material culture, are attested in the historical literature as providing tapa cloth – but have been largely discounted in recent summaries. In both cases, there is evidence that this omission has been a mistake, and I would encourage contemporary makers to explore their usefulness as barkcloth trees. The first is *Hibiscus tiliaceus* (*hau*, *fau*, *vau*, the sea hibiscus), well known as a fibre plant for moderate-stress cordage, and for providing exquisite lace-like flat ribbons of heavily retted bast which adorned *liku* skirts, dance club handles and some spear shafts in 19th-century Fiji (Hooper, 2016: 152-155; Plant Profile 5). Such ribbons show that *Hibiscus* provides a strongly consolidated bast fibre system. It was historically recorded as a tapa species in four Polynesian countries: Niue (Smith, 1902: 213); Aitutaki in the Cook Islands, where it was known as *purautea* (Hiroa, 1944: 67);[13] the Austral Islands, where

11 Kooijman (1972: 9-10) seems to have conflated mati into his discussion of aoa cloth, but the two *Ficus* species, and their resultant cloths, are different. The *Ficus tinctoria* also grows in Western Polynesia (it is known as masi in Tonga), but it seems (in the last 250 years at least) not to have been used to derive a cloth. Whether the fact that masi is the Fijian term for tapa has any significance here (or none) is for linguists to decide.

12 Personal communication, 2016.

13 In Kooijman (1972: 47) a typographical error renders this term *purantea*.

it was called both *purau* and fau (Aitken, 1930: 14-15); and Hawai‘i, where it is known as *hau* (Brigham, 1911: 134-135). Tamburini et al.’s recent (2019) fibre analysis of a Hawaiian kapa *malo* loincloth in the British Museum (BM Oc, Haw.25) has shown it to be made of *Hibiscus* bark, seemingly settling the question once and for all. That garment is of a typically 18th-century style, and the fabric is thick, coarsely beaten and of a mid-greyish-greenish-brown, retaining numerous small regularly organised round knot-holes – a diagnostic feature which can be seen on several similar kapa malo samples collected on Cook’s third voyage in 1778-1779.[14]

Kooijman (1972: 179) also lists the *mio* (*Thespesia populnea*, the Pacific rosewood) as providing a good bast for tapa in the Marquesas Islands (cf Linton, 1923: 411). In *Ke Hana Kapa*, Brigham (1911: 135) says much the same for Hawai‘i, where it was termed *milo*, and draws an explicit similarity to the *Hibiscus*. This requires further exploration by contemporary makers and scholars to establish first its validity, and second the characteristics of such a cloth if its production is possible. Nonetheless, we can certainly state that the bast fibres of various *Thespesia* species are exploited for good cordage in many parts of the world (Mansfeld and Büttner, 2001: 1604-1605).

Uncertain and unlikely tapa species

Over the history of tapa manufacture’s description in the literature, a few other species have been described as producing barkcloth. For various reasons outlined, these species are either very uncertain, or have been rejected entirely by different scholars, and are not considered viable tapa species here. Rather, such attributions are taken to be the outcome of errors in historical documentation or translation. Many seem to originate from a failure to differentiate between plants providing a bark strip, bast fibre or leaf strip to produce woven textiles on the one hand, and plants providing a cohesive and malleable bast layer to produce tapa. For example, in the Marquesas Islands, the *pukatea* (*Pisonia brunoniana*, catchbird tree) is listed as providing ‘a kind of tapa’ by Von den Steinen (1925, II: 5; cf Kooijman, 1972: 179). That said, it is notoriously brittle-branched (the forest floor often being littered with its rotting limbs around the base of its trunk), which seems to little recommend it as a bast plant. Given that its famously sticky fruits were also used in Hawai‘i (where it is *pāpala kēpau*) to catch birds for cloak-making, by smearing them onto the branches of the preferred food trees of nectar-feeders, there may be some garbling of historical data here (Lincoln, 2009: 124); alternatively, given the similarity of pukatea to purautea, it may be a mis-transcription that also indicates *Hibiscus* tapa in the Marquesas.

In Hawaiian mythology, three species are listed as used for producing tapa prior to the coming of paper mulberry: while breadfruit and māmaki are well understood as tapa species, the outer bark of *ma‘auea* (a banana (*Musa*) hybrid) is also listed (Beckwith, 1970: 98-100). Ma‘auea leaf strips were traditionally woven to make thatched rain capes. However, bananas are not (in botanical terms) trees, have no bast, and cannot provide barkcloth. A similar situation has occurred, I suspect, in the description of *Entada phaseoloides* being used by commoners on Mangaia for producing a coarse barkcloth (Hiroa, 1944: 74); this

14 Hiroa (1944; 1957) discounted the original written sources on *Hibiscus* barkcloth for both the Cook Islands and Hawai‘i, and it is clear that he considered *Hibiscus* purely a cordage fibre plant, while Kooijman (1972) was considerably more circumspect on the question.

creeping liana in the Fabaceae (pea) family is notable for its long pendulous seed pods similar to those of the tamarind, which might have furnished a useful strip for coarsely woven or quickly run-up skirts. Brigham (1911: 215) listed the *'akala* (*Rubus hawaiensis*, Hawaiian raspberry) as a species for making kapa; as Hiroa (1957: 168-169) remarked, however, while it provides a fine pink colourant, it has no properties for furnishing bast.

Discussion

A consciousness of the genetic relationships and botanical classification, cultivation and harvesting, and cloth characteristics of the various species documented as tapa plants of Polynesia is helpful for revealing what they have in common, and how they differ. Confusion in the secondary sources of the 20th century is perhaps more of a factor than confusion in the primary sources of the 18th and 19th centuries. The Moraceae and Urticaceae families are each large, and few of their genera and species have ended up being selected for barkcloth production around the world. Nonetheless, they are themselves more closely related to each other than to any other plant family within the order *Rosales;* according to the Angiosperm Phylogeny Group III classification, therefore, almost all of the world's common barkcloth species can be found within a comparatively small group of what are informally termed the Urticalean Rosids – demonstrating the common origin of a set of common structural characteristics that merit ethnobotanical exploration in the future (Sytsma et al., 2002).

Knowledge of which plants were exploited in each archipelago, historical descriptions of their cloth characteristics, and examination of historical museum collections, in concert with an awareness of the methods of their cultivation and harvesting, can in most cases provide us with a reliable set of physical characteristics for the visual deduction of species. I believe there are only three localised situations where it cannot: first, in extremely white Society Islands ahu, the differentiation of *Broussonetia papyrifera* from either the pu'upu'u variety of breadfruit or *Ficus tinctoria;* second, in Society Islands ahu ranging between a pale cream and a coppery-fawn brown colour, the differentiation of unbleached paper mulberry from bleached breadfruit, and composite mixtures of the two; and third, in Hawaiian kapa the differentiation of breadfruit from *Wikstroemia*, where both might take on an oatmeal-like colour. In all three cases, however, it is fair to say that the latter options are significantly less likely than the former.

Overall, it seems to have been the case that each of the principal tapa species of Polynesia was culturally differentiated by social class associations and ceremonial functions. In general, breadfruit was a cloth of the common people; paper mulberry was strongly preferred by the upper classes and the only species widely commoditised or used as storable wealth; and banyan was highly restricted to ceremonial use on the marae, or for the dress and bedding of social elites. By the 18th century, at any rate, both breadfruit and banyan were much less significant in Western Polynesia than in Eastern Polynesia. Particularly in the latter case of banyan's ceremonially significant orange-brown cloth, however, we might see certain traditions of Western Polynesian pigmentation – such as the smoked *masi kuvui* of Fiji, as well as the black-painted *ngatu 'uli* of Tonga and related styles – as intimations that a naturally dark tapa may have formerly carried similar cultural associations of nobility and sacredness in the west too. For me personally, the most surprising fact to have emerged whilst undertaking this review of historical data on tapa species has been the prominence of *Artocarpus* cloth in the central groups of

Eastern Polynesia; very much a species which was an equal alternative to *Broussonetia*, and a replacement when the latter was in short supply, if viewed as marginally inferior in quality. This alone merits the reconsideration of historical museum collections with an eye more sensitive to the fine gradations of fabric colour and texture resulting from species selection by makers.

~ Plant Profile 1: Fibre ~

Paper mulberry *Broussonetia papyrifera* (L.) L'Hér. ex Vent. MORACEAE

Mark Nesbitt

Left: Coppiced trees in the garden of the Bishop Museum, Oahu, Hawai'i.
Right: Jacques-Antoine Moerenhout, Tahiti, c. 1830-1840 (Muséum national d'Histoire naturelle, Paris, P06758371). A rare flowering specimen, showing the globous female flowers.

Paper mulberry is native to southeast Asia. Genetic evidence shows that it was carried from Taiwan and cultivated in plantations by early voyagers, reaching throughout Polynesia. Although it can grow to be a tree 35 metres high, it is coppiced (cut at ground level) in Polynesia, forming a multi-stemmed shrub 2-4 metres tall. Paper mulberry is dioecious, that is with separate male and female-flowered plants; it was exclusively female plants that spread as canoe plants (Florence, 1997; Peñailillo et al., 2016). Without fertilisation these do not set seed, so the species was spread vegetatively, carried as suckers. Today some male plants are also found in Hawai'i, probably the legacy of a recent introduction from Japan where paper mulberry is grown for paper-making. Like many other genera in the mulberry family, including breadfruit and some wild figs, the tree's inner bark is strong and amenable to beating into barkcloth. The coppiced trees are usually cut at 1-2 years old and less than 4cm in diameter, as the young inner bark is easier to separate from the outer bark, and easier to beat. Once the stem is harvested, a vertical incision in the bark allows it to be removed, and the inner bark can then be separated from the outer bark.

Vernacular names (selected): Tonga, Niue: *hiapo*; Samoa: *u'a*; Futuna: *lafi*; Cook Islands, Aotearoa New Zealand: *aute*; Hawai'i: *wuake*.

Breadfruit *Artocarpus altilis* (Parkinson) Fosberg (formerly *A. communis* J.R. Forst. & G. Forst.) MORACEAE

Mark Nesbitt

Left: Leaves and fruit at Puehuihueiki cemetery, Lahaina, Maui, Hawai'i.
Right: Male flowers and pressed leaf of breadfruit. Major General C.G. Gordon, Seychelles, 1881-2 (Kew, EBC 42759).

Breadfruit trees grow up to 15 metres in height, and are easily recognised by their massive (to 90 cm length) lobed leaves and large, starchy fruits. Breadfruit was probably domesticated on the islands of New Guinea and the Moluccas, from wild ancestor *A. camansi*, and spread to Melanesia and Polynesia by Lapita migrations beginning 3500 years ago. It travelled as root cuttings, leading to the evolution of the seedless landraces that dominate Polynesia. Breadfruit trees do not become naturalised in Polynesia. The importance of the fruit in Pacific diet is reflected in the existence of several hundred landraces, many now grown at the National Tropical Botanical Garden in Hawai'i. Breadfruit is a multi-purpose plant, with timber that is hard and termite-resistant, a milky sap used as a glue, leaves used as wrapping for food, and several plant parts used medicinally. As discussed in Chapters 1 and 3, breadfruit inner bark, both from the stems of young saplings and from two year-old branches of trees, appears to have been an important source of barkcloth fibre in some island groups of eastern Polynesia, such as Tahiti and the Cook Islands, at the time of European contact. However it is little represented in 19th-century or later museum collections.

Vernacular names (selected): Samoa, Hawai'i: *'ulu*; Cook Islands: k*uru*; Society Islands: *maiore*, *'uru*; Tonga, Niue, 'Uvea, Futuna, Marquesas: *mei*.

2

Technical Variation in Historical Polynesian Tapa Manufacture

Andy Mills

Interaction with tapa from several Polynesian traditions quickly shows that a great range of fabric types was produced around the turn of the 19th century. While some textural and colour variations emerge from the choice of plant species constituting the cloth (see Mills, Chapter 1), the principal tapa species are genetically very close, and this material distinction is less significant than might be expected. By contrast, the highly variable processes of tapa manufacture have an enormous impact on the finished qualities of Polynesian barkcloth. This chapter addresses that variation in manufacturing techniques and technologies as an interrelated set of cultural systems, which can be read in the material qualities of a fabric. The principal works on tapa in Pacific art history have focused on the delineation of geographically distinct decorative styles, to eradicate the vague or inaccurate geographical attributions that ethnographic museum collections inherited from early 19th-century western collectors. Scholars are still tracing the rarer unlocalised and discontinued styles to their correct archipelago of origin, and it seems likely to be some decades more before we can speak confidently about the tapa styles of specific islands and historical polities within many island groups.[1] Some early historical accounts of tapa making contain information absent from later syntheses and vice versa. Moreover, some recent key works have heavily prioritised one national tradition of manufacture over others and have sometimes generalised inaccurately from local practices.[2] Neich and Pendergrast (1997b: 13) assert that the greater part of variation in tapa production can be found in its decoration, and fall back on Hiroa's (1944; 1957) binary distinction between the pasted cloths of Western Polynesia and the *'felted'* (here, *fused*)

1 Such aims have themselves enjoyed mixed success. Traditional knowledge holders have only ever been partially engaged in the writing of such studies. Much has been forgotten that was formerly known by Polynesian women of past generations. The art historical assessment of several Polynesian tapa traditions – notably the Austral Islands and the northern island groups of Western Polynesia – have been rather rudimentary.

2 For example, Neich and Pendergrast (1997b) primarily relied upon Samoan ethnographic data, while Hiroa's ethnographic understandings were developed in Samoa and the Cook Islands, and Kooijman's in the Lau islands of Fiji.

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cloths of Eastern Polynesia. However, this useful division conceals as much technical complexity and diversity as it explains. Kooijman's (1972) landmark *Tapa in Polynesia*, conversely, presents such a wealth of data that the humble researcher might despair of adding another useful word on the subject; and yet, it does not impart a sense of tapa as a regional system of techniques interrelated in the middle range of their complexity.

As one aspect of this volume's approach to tapa from a material and technical perspective, this paper therefore aims to provide a brief general regional account of tapa production. Its central concern is the relationship between varying technical practices and the formal traits of their material outcomes. Consequently, I only address the decoration of tapa here when its manufacture cannot be accurately explained without it. Understood as an operational sequence, the techniques of tapa production varied in numerous ways across Polynesia. Vital to our understanding of the art form's stylistic history, however, those numerous technical variations fortunately arise from a comparatively small number of easily understood technological developments. As these transformations produce such significant differences in the finished fabric, their description is not only valuable for its own sake, but also allows naked eye examination to attribute many undecorated cloths to specific island groups or regions of Polynesia. As is always the case in material culture studies, understanding manufacturing processes, style and provenance is an interdependent enterprise. All extraneous analytical frameworks will inevitably fail to actually grasp the artist's mental construct of the work, objectives and actions perfectly, and the art historian must content themselves with a good approximation at best. The deployment of many different techniques geared towards the art work's realisation is performed responsively in real time, and in truth we never actually repeat anything in the same way; not even two single gestures with the same tool.

It is not simple to frame the stages of tapa manufacture (and beating in particular) into a single etic structure of phases with universal applicability to all of Polynesia. Accounts of Tongan, Samoan and Fijian manufacture tend to frame beating as a single phase sandwiched between bast preparation and pasting (Martin, 1817; Williams, 1858; Buck, 1930). In the Cook Islands, however, Hiroa (1944: 70-71) framed it into three phases (with Aitutaki terminology) of primary beating, secondary beating and finishing – with distinct aims to flatten the bast and 'bring out its texture', achieve the correct thickness and fuse sheets together, and to lightly complete the surface with its final beater mark. His later writing on Hawaiian *kapa* (1957: 180-182) frames its manufacture into two phases based on the use of stone anvils and round-sectioned *hohoa* beaters (the *hoʻomoʻomoʻo* phase) to condition and thin the bast, and the use of wooden anvils and square-sectioned *iʻe kuku* beaters (the kuku phase) to complete the cloth. However, this latter phase also subsumed fermentation and various mechanical operations, and from an etic, material perspective, the transition from hohoa to iʻe kuku was simply determined by the need for a more delicate tool, rather than any change in the aims of beating. It seems to me, then, that an etic rationalisation of barkcloth's manifold manufacturing processes requiring ten distinct phases is necessary for even the simplest clear regional explanation. However, several of these phases are culturally specific to different traditions. The ten principal manufacturing phases outlined here are shown in Table 2.1. Around the year 1800, no Polynesian society utilised all the techniques described below, and those possessing most (notably the Society Islands and Hawaiʻi) employed them in different phase combinations to produce radically different fabrics. There are, however, very few (if any) exceptions to this basic sequence of manufacturing phases.

Phase	Principal Activities
1	Bast preparation and pre-soaking
2	Soaking and retting of scraped bast
3	Fermentation of retted bast
4	Initial beating and pre-fusing
5	Spreading and homogenisation
6	Fusing composition
7	Beater marking
8	Pasting composition and rubbed decoration
9	Textural finishing and conditioning
10	Post-completion reworking: pasting and re-beating

Table 2.1. An etic model of technical phases in Polynesian barkcloth manufacture.

Phase 1: Bast preparation and pre-soaking

On Tongatapu in 1777, James Anderson (Beaglehole, 1969, III: 905-906) observed women putting a circumferential cut around their *Broussonetia* saplings just above ground level with a clamshell, snapping the slender stick off at this point, slitting the trunk all along its length, and pulling the bark off in a single sheet. This generally describes stripping for the whole of Polynesia – the only minor variations seeming to focus on whether it was the teeth or a shell used to begin the separation of the bark from the wood, and whether a shell or the thumb was used as a bodkin to continue the work. In both Tonga and Fiji, once the bark was stripped from the woody sticks it was then steeped in water for 24 hours, 'to facilitate the separation of the epidermis' (Williams, 1858: 65).[3] The outer bark (or more properly, the cortex) was then immediately scraped off the bast (or secondary phloem) with the same bivalve shell, although Veys (2017: 35) notes that this has been replaced with a pulling method as described for Eastern Polynesia below. The moistness of the bark was an important factor in preparing the trees: a drier bast facilitated stripping from the sticks, while a moister bast facilitated an easier separation of the bast and outer bark; several sources relating that, once a stick was cut, the outer bark should be removed within 24 hours. Kooijman's (1972: 345-346) Lau-focused account omits this pre-scrape soaking in his discussion of Fijian *masi* making. He also discounts a similar several-day saltwater soak to facilitate bark removal in 'Uvea (1972: 250). At Tahiti in the mid-1770s, Johann Reinhold Forster (1778: 445-446) also remarked on the stripped bark being: 'put into a running stream, under a board loaded with stones; when the water has rendered the filamentous part of the bark more flexible, dissolved the gummous substance which joins them, and softened the pulpy intermediate substance, then the women scrape the bark, in or near the water, on a smooth board.'

There was a striking operational similarity between the bark removal process in Samoa, Tahiti-Nui and the Marquesas Islands around 1800 – women scraping down the bast on a rectangular wooden board with a clam shell to remove the cortex, while sitting in a stream or at its very edge to permit the fresh running water to clean the bast and wash out its 'sap and slime' (Buck, 1930: 285; Morrison, 1935: 160-161; see Figure 2.1). Viti Levu women, Kooijman (1972: 345-346) informs us, traditionally did much the same but

3 Veys (2017: 33-35) notes that pre-soaking has been abandoned in modern Tonga.

Figure 2.1. A Samoan board for the scraped removal of paper mulberry epidermis from the bast, alongside the bivalve shells employed in the process. Mid-19th-century (Kew, EBC 42887).

laid the bast on a bamboo water carrier instead of the bespoke scraping board. Neich and Pendergrast (1997b: 13) recount that Samoan women, apparently for comfort, abandoned this practice in the later 19th century, and now rely on a bowl of water indoors.[4]

Ellis' (1829, II: 172) description appears to refer only to the Austral Islands, as he substantially contradicts Forster's account and describes a dry bark stripping and scraping for both *Broussonetia* and *Artocarpus* as occurring before a light initial beating. Wilson (1799: 370) shows that Tahitian women could manipulate the aesthetic qualities of the finished cloth even at this stage: 'if they wish it to be clouded, they break the outer bark with a stone, and wrap the sticks in leaves for three or four days before they bark them'. It is unclear to me what fabric this 'clouded' Tahitian tapa might equate to in museum collections. For the Cook Islands, Hiroa (1944: 70) also describes a dry bast preparation method and remarks on the outer bark being prised and then pulled away from the bast in long strips – a technique also found on Hawai'i and Rapa Nui (Kooijman, 1972: 102, 199), which was surely much more efficient than the laborious scraping technique found elsewhere.

4 As the women are likely to have undressed to get in the water, we might suspect it was the censure of Anglican missionaries from the 1830s onwards, rather than comfort, which motivated this change.

Phase 2: The soaking and retting of scraped bast

Soaking was practised quite differently in different areas of Polynesia, and Forster's description of the impact of Tahitian pre-soaking indicates that soaking's material consequences for the finished qualities of the tapa were much more significant than has been emphasised in the recent literature. Traditional Polynesian practices seem to have broadly fallen into two basic categories: a short soak in Western Polynesia and a long soak in Eastern Polynesia. This is of vital importance to our understanding why the texture of many cloths produced in Western Polynesia retains a 'fibrous' visual appearance (the visible 'fibres' actually being bundles of numerous microscopic bast fibres), while many cloths produced in Eastern Polynesia (using a long soak and other methods discussed below) have an even and uniform texture. However, as the practice varied so widely with such fundamental implications, it is certainly worth enumerating those variations here. In Tonga, the freshly scraped bast was left to macerate for 24 hours (Beaglehole, 1969, III: 905). Conversely, the available data for Fiji suggests this was only conducted in the heavily Tonganised chiefdom of Lau, while elsewhere in Fiji the bast was only soaked overnight before scraping, and in Samoa, the aforementioned riverine scraping was seemingly considered an adequate wetting (Buck, 1930: 285; Kooijman, 1972: 346-347). Touching at Huahine in the Leeward Society Islands in 1773 on Cook's second voyage, Johann Reinhold Forster was told that the locals soaked their scraped bast in a pond for a full month to condition it before the fermentation and beating phases which required a further five-six days in all (Forster, 1778; Shaw, 1787: 5).

Hiroa's (1957: 169) description of the highly developed Hawaiian method is particularly informative, as he mentions both the use of saltwater for an extensive soak of seven days, and its stated aim as the leaching out of an undesirable component of the fresh bast (*'ua lele ke kae oka wauke'* – metaphorically, the 'edge' of the *Broussonetia*), thus rendering it soft and pulpy. These details also make it clear that the pre-scraping and post-scraping soak resulted in essentially the same transformations of the bast. Bishop's (1940: 24-25) account also adds important details and highlights variety in the Hawaiian practice, remarking that a freshwater soak of anything from seven to thirty days was common, while a seawater soak of ten days duration (usually in a quiet rockpool at the shore) was primarily intended to bleach the bast – as is also widely done with pandanus leaves for basketry in many parts of the Pacific. Her remarks (1940: 31) that the bast for *malo* loincloths and *pa'u* skirts was both soaked and beaten for a much shorter time than bast for other purposes, in order to preserve more of its strength, are very significant. As well as explaining the thickness and minimal beating of several elaborately printed cloth samples collected in the 18th century (including several in the Shaw albums), it also shows that the Hawaiian kapa maker was striking a fine balance between the strength and coarseness of unworked bast on one hand, and the weaker softness of a highly transformed material on the other, as her desired outcome prescribed. This tension between strength and softness was surely universal to all barkcloth manufacture, but particularly so in those areas where extensive retting was practised. This saltwater retting is extremely similar to those also traditionally practised in Europe and South Asia for the processing of flax, jute, ramie, hemp and coconut fibres, where it separates the fibre bundles by leaching out the pectin (Forster's 'gummous substance') that holds the fibres together and introducing anaerobic pectin-eating bacteria (Wells, 2003: 499; NIIR Board of Engineers, 2014: 137-138). In a more delicate material like *Broussonetia* or immature *Artocarpus*, the impact is profound.

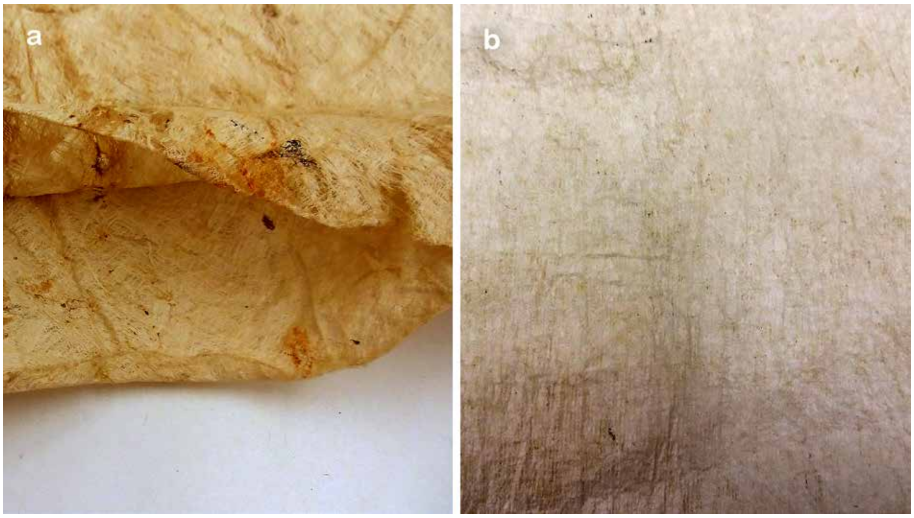

Figure 2.2. The stark visible contrast between the finished structure and texture of barkcloth from: a) unretted bast soaked for a short period and b) retted bast soaked for a long period.

The breakdown of much of the pectin enables the beating to distribute the fibre bundles evenly and allows the fibres in superimposed layers of bast to entangle and lock together during the fusing process (Phase 7). Such retting fundamentally transforms the bast thereafter and enables several subsequent operations which are essentially impossible with unretted bast, because the retted material becomes (and remains) semi-plastic when wet – and (like paper) can therefore be reworked in various ways. Western Polynesian tapa, conversely, with its short soak and more fibrous resultant texture, is highly reliant on pasting and substantially fixed thereafter. This explains why much more variation exists in both the etically classifiable form, and the emic classification, of different cloths in Polynesia to the east of Niue. This seemingly minor technological difference in bast preparation – in combination with a set of techniques it subsequently enabled – wholly transformed the medium to the point where the two different approaches were almost as different to each other as each was to paper-making (Figure 2.2).

Phase 3: Fermentation of retted bast

Fermentation in Eastern Polynesia is another key transformation in the preparation of the bast for beating, which must be understood as closely correlated to the long retting soak that preceded it. A phase of fermentation was implemented in the Society Islands, Cook Islands, Austral Islands, Marquesas Islands and Hawai‘i. Fermentation acted to condition the bast in a manner which allowed its subsequent beating to fuse sheets together into a continuous surface. In the west, conversely, it was only the pasting together of sheets which enabled the production of large tapa sheets. The historical processes of fermentation are not as well understood as they might be – largely due to tapa's earlier decline in many of the nations where it was practised. That said, we have a few informative accounts. On Mangaia in the Cooks, Hiroa (1944: 70) tells us that the bundled bast, still wet from an additional washing, was wrapped up tightly in impermeable banana leaves (or old and tough taro leaves on Aitutaki), then left to sit for three full days. As he relates, the most skilled women were able to taste the bast bundle and determine by its (presumably sour or bitter) flavour that it was ready for beating. Handy (1923: 162) recounts a similar method in the Marquesas, lasting four days. On Tahiti-Nui in the late 18th century, Morrison (1935: 160-161) provides some key facts: In a similarly layered and wrapped bundle, the sodden bast was insulated under a deep layer of grass cuttings and left for three-four days. When removed, it had become 'clammy and glutinous', at which point it was ready for working into a cohesive cloth (cf Oliver, 1974: 145). Bishop (1940: 25) recorded that Hawaiian fermentation was achieved by wrapping wet *mo'omo'o* (bast sheets) in *ki* (*Cordyline fruticosa*) leaves, and placing them into a lidded calabash for ten full days. These accounts indicate many pertinent features of the process, which has clear technological affinities with the European technology of silage-making. The fermenter created a moist, dark and fairly airless environment for the assembled stack of bast which would, under the weight of stones, fuse together into a single laminated mass of fibres. The art of fermentation was well developed in all Polynesian civilisations, and fermented carbohydrate dishes such as the classic Hawaiian *poi* were both a dietary staple, a defence against famine and siege, (in some cases) a mildly alcoholic luxury, and a refined delicacy (Hiroa, 1944: 20-21). Fermentation's operational properties were well understood and skilfully managed, and we should of course expect nothing less for the fermentation of tapa. The result of this transformative operation on the superposed bast layers was to further reduce the former coherence between bast fibres within fibre bundles, and between bundles within bast sheets, and to increase the coherence between bast fibres and fibre bundles in adjacent bast sheets – driving the overall cuboidal mass of bast into the state of an ever more plastic material. That expert makers tasted the bast stock to assess the progress of fermentation clearly indicates that it effected a chemical transformation. The temperatures and acidities required for the breakdown of the bast's cellulose and hemicellulose components are unattainable by such processes, allowing us to infer that this fermentation must have been a bacterial and/or fungal degradation of the pectin and lignin components.

Phase 4: Initial beating and pre-fusing

Fundamental to all tapa production, *initial beating* corresponds with the Hawaiian *ho'omo'omo'o* phase and the Aitutaki *'oa'anga* phase. Its aim was not at this stage to work directly towards a finished cloth, but to bring each strip into a suitable condition for that; flattening out the barked and soaked bast, and partially splitting the fibre bundles to open up the structure. It was conducted with the heaviest hand of the whole process and the most coarsely grooved face on the beater. In those Eastern Polynesian societies where stone anvils were used as well as hardwood ones, and round-sectioned beaters as well as cuboidal ones (the Marquesas Islands, Hawai'i and Rapa Nui), their use was entirely restricted to this first of the five beating phases (Kooijman, 1972: 103-104, 180-181, 199-200). There was considerable cultural variation in the way women undertook the initial beating of the bast. Mariner (Martin, 1817, II: 289) recorded that two or three Tongan women might sit at a *tutua* (anvil) 1.8m long, rhythmically beating with their right hands and moving the bast under the *ike* (mallet) with their left, then swapping over when one arm tired without breaking the rhythm. Both Parkinson (1773) and Reinhold Forster (1778) saw much the same scene at Tahiti. Conversely, Ellis (1829, II: 177) described 16-20 Austral

Figure 2.3. Lapped tabs in Fijian masi barkcloth, a diagnostic feature found only in barkcloth from Fiji and produced by pinching knot-holes closed and beating them in (detail of The Hunterian, GLAHM: E.610).

Islands women of all ranks beating together on a scale of collective activity only seen in Western Polynesia at the pasting stage (Phase 8).

The *pre-fusing* of bast at this stage of production highlights the fact that Hiroa's axiomatic dichotomy between pasted Western Polynesian cloth and fused Eastern Polynesian cloth is much too strict to represent the historical realities. In Fiji, for example, Williams (1858: 65-66) wrote: 'Two lengths of the wet masi are generally beaten together, in order to secure greater strength; the gluten which they contain being sufficient to keep their fibres united' (cf Kooijman, 1972: 353-354). At this early stage of beating, therefore, *Broussonetia* bast strips can be beaten together without a long soak, fermentation, or pasting – something I corroborated myself on 'Oahu in 2017. One aesthetic characteristic of Fijian masi which was achieved in the pre-fusing phase was the creation of small repeating double-thickness areas in the cloth of a rhomboidal or triangular shape. These *lapped tabs* were achieved by pinching the fabric at the edges of a natural split or knot-hole, overlapping them and beating them flat to fuse the hole closed. In some examples a loose diagonal pattern of the tabs is evident, created by the alternate opposite growth habit of *Broussonetia* when allowed to grow without regular side-pruning. In other examples, this pattern is simulated or enhanced for aesthetic purposes (Figure 2.3).

Phase 5: Spreading and homogenisation

Spreading and homogenisation can be viewed as the central phase of working the bast into a basic wearable condition and was (like Phase 4) universal. As implied, its two principal objectives are to increase the area of the cloth until it reaches the greatest possible area without tearing apart or reaches the desired thickness; and to homogenise the sheet's thickness as this work goes along. Participant observation of tapa beating in 2017 emphasised the artist's delicate regulation of the beating process so that tiny adjustments with the wrist in the angle at which the beater strikes the bast surface enables each strike's force to be directed more to the left, the right, or equally in both directions – and by this means thicker sections of bast may be thinned out, and thinner sections built up. Small holes can also be closed by this means, even in little-soaked bast. The artist creates a wave of thicker material in the bast and drives it sideways towards the edge of the sheet, spreading its overall area and progressively homogenising its thickness and structure. The density of grooving on the beater face determines the scale at which such lateral spreading effects are applied to the material, and so the artist adaptively moves to increasingly finer grooved faces as the fabric gradually approaches the desired shape and uniformity.

Area and overall thickness are competitive outcomes in any fixed volume, but the *homogeneity* of thickness is not, and the considerable variation in this trait between cultures reflects different technological approaches and capacities elsewhere in the operational sequence of manufacture. Thus, James Cook noted of Tongan barkcloth: ‘Very often they take the layers of bark just as they are cleaned, and beat them out as thin as they will bear without any regard to form’ (Beaglehole, 1969, III: 171-172); such pieces were destined for lamination and pasting into much larger compositions, however, and so we can recognise that maintaining and homogenising thickness were subordinate concerns to deriving the largest useful area from each strip. In Eastern Polynesia, conversely, the extensive retting and fermentation discussed above rendered the bast more plastic, and meant that single sheets of uniform fabric were the principal intended outcome. The labour of beating such a conditioned material into shape was greatly reduced, and better outcomes were achievable at less cost.

Another integral part of the spreading phase which has received scant scholarly attention is the folding of the bast sheet during beating. In early 19th-century Ha‘apai, central Tonga, Mariner (Martin, 1817, II: 290; cf Beaglehole 1969, III: 906) observed: ‘In the course of about half an hour it is brought to a sufficient degree of thinness, being so much spread laterally as to be now nearly square when unfolded; for it must be observed, that they double it several times during the process, by which means it spreads more equally, and is prevented from breaking.’ As Kooijman (1972: 352-353) explains for Fiji, folding over the naturally narrower upper end of the bast enabled the doubled or tripled thickness to be spread out more steadily by the diffusion of the force through a more substantial volume, permitting the sheet to become squarer overall (if significantly thinner at one end). By the end of Phase 5, the basic fabric of Tonga, Samoa and Fiji was almost completely beaten and ready for pasting. In much of Eastern Polynesia, however, the beating continued through two further steps.

Phase 6: Fusing composition of sheets

With the minor exception of those rudimentary *pre-fusing* operations detailed in Phase 4 above, true fusing of the sheets was seemingly dependent on the long retting soak and fermentation of the bast; it only occurred in societies where those highly developed operations were also practised. Essentially, it seems that the limited capacity of un-retted Moraceae bast to be ‘pre-fused’ was eliminated by the work of spreading and thinning the bast in Phase 5, precluding the further fusing entanglement of the fibres in their natural state. Conversely, in the glutinous layered bast stock that came out of the fermentation clamp, fusing was powerfully enabled by the biological digestion of the pectin and the mechanical juxtaposition of layers. In practical terms, fusing itself was very straightforward with properly conditioned bast: Two sheets of damp tapa are overlapped at the edge by a few centimetres, and beaten vigorously to smash their fibres together, striking only with the distal end of the beater to focus the compressive force into a small area; once joined in this way, the thick overlap was then beaten out with the conventional spreading technique of Phase 5 to even out its thickness with the areas on either side, and the operation was complete. Transmitted light will often reveal a less translucent band where a join was made during the fusing phase.

Although this fusing of bast sheets has previously been called *felting* in various works on Pacific art history, it is important to note that this process was not (by some strict definitions) a true felting technique. All operations of beating, folding and layering served to increasingly disorder the natural linear structure of the bast fibres towards a chaotic multidirectional mat (towards the fully pulped and reconstituted state of true paper, essentially) and to further fuse the fibres and fibre bundles in adjacent layers to one another. As with the repeated folding of superposed layers in the production of filo pastry or Japanese sword blades, exponential doubling soon multiplied the number of layers in a cloth greatly, while blurring their boundaries and entangling their fibre bundles evermore completely.

Phase 7: Beater marking

Phase 7 completed the beating of cloth throughout Eastern Polynesia. It is important to realise that this phase was – in Western Polynesia also – wholly concerned with the visual aesthetics of the fabric, and not a final remnant of the spreading and homogenisation activities of Phase 5. We do occasionally see cloths where this phase has been omitted; what one finds there is a mixture of two or more beater mark grades (*i.e.* grooving densities, corresponding to two different faces of the beater), and those marks at seemingly haphazard orientations where, during the later parts of Phases 5 and 6, the artist has passed over the cloth striking selectively in different areas to thin out any thicker areas of bast remaining from the fusing of sheets or natural irregularities. These, then, correspond to the chisel-marks of the sculptor or the fingerprints of the potter, which Phase 7 sought to erase by replacing them with a uniform linear pattern (Figure 2.4). The artist's hand becomes increasingly light over Phases 5 and 6, but at this stage she returns to a more vigorous, smart rapping action. Carefully drawing the cloth across the anvil in sections to maintain a good line, the final selected beater mark obliterates all other marks, and thereby imparts a strict uniformity. The same is, of course, true for the final flat-faced beating of Western Polynesia, but there the aesthetic motivation is to flatten and

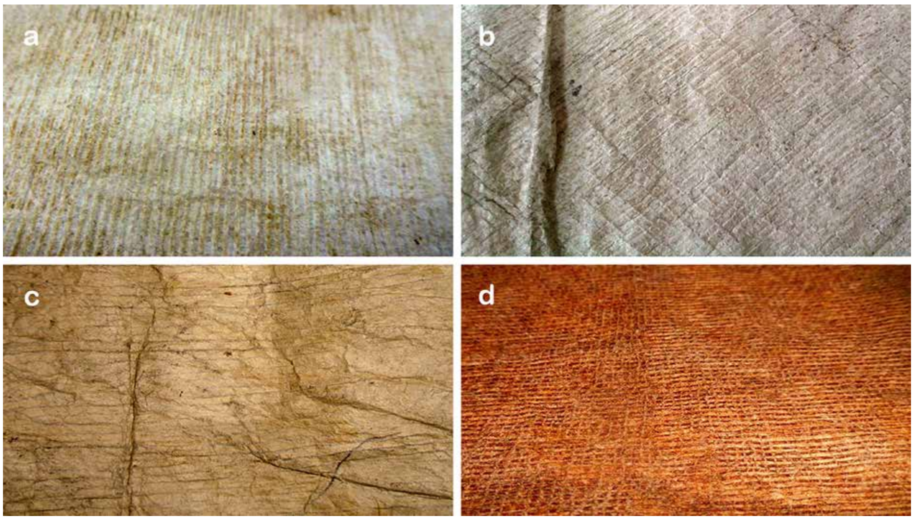

Figure 2.4. Permutations of linear beater marks on Central Polynesian barkcloths.

consolidate the surface, thereby bringing out the natural organic structures in the bast. I discuss the more complex issue of non-linear beater marks in Chapter 7.

Phase 8: Pasting composition and rubbed decoration

The traditional Tongan composition of cloths by pasting has been well described (Martin, 1817, II: 290-292; Neich and Pendergrast, 1997b: 41-42; Veys, 2017; see Lythberg, Chapter 10), and serves as a good model for the overall technique. In Tonga, the convex surface of the *papa koka'anga* (broadly 'resining bench', some 90-120cm wide and 3m long or more) provides the working surface for the pasting, at which several pairs of workwomen sit facing each other. *Kupesi* pattern rubbing boards are temporarily bound onto the surface of the papa in attractive tessellating arrangements, then composition begins. Single strips of plain beaten cloth (*tapa*) are termed *feta'aki* in Tongan, and two feta'aki are laid transversely between each pair of women, tapering in opposite directions to compensate for their natural trapezoidal narrowing. Overlapped slightly where they centrally abut, the seam between the two feta'aki (and those between the feta'aki of adjacent pairs of women) are pasted together by rubbing them with parboiled tubers of the *māhoa'a* (elsewhere termed *pia*, *Tacca leontopetaloides* or Polynesian arrowroot; Plant Profile 8). In Tonga, Samoa, 'Uvea and parts of eastern Fiji, the formed continuous sheet is then usually rubbed over with the resinous brown sap of *koka* (*'o'a* in Samoan, *Bischofia javanica*; Plant Profile 9), which transfers the relief patterns of the kupesi (Samoan '*upeti*; Fijian *kupeti*) onto it. A second layer of cloth is superimposed on the first, the feta'aki laid at right angles to the bottom layer and again pasted together at all adjoining edges – with the double effect of also glueing them to the first layer. At this stage, small scraps of cloth may be interleaved and pasted to patch any knot-holes or tears unresolved during beating. A second application of *Bischofia* resin follows to impart the rubbing patterns to the upper layer. Ostensibly complete, this piece of pattern-rubbed cloth the same size as the papa's surface constitutes two *langanga* (length units of Tongan *ngatu*, each langanga being the equivalent of the papa's width in front of each woman from the central ridge down to her knees). Pulled across and neatly folded under the papa, two more langanga are begun and pasted onto the edge of this sheet, and so the work progresses to create very large cloths of 50 or 100 langanga. In this state, certain styles of Tongan *ngatu tahina* ('white decorated tapa') were essentially finished and ready for storage or use.

The foregoing describes the process of pasting composition (in its most basic terms) faithfully enough for Tonga, Samoa, Fiji, Futuna, 'Uvea and Niue. Naturally enough for such a vast and culturally diverse region, however, there were numerous important and diagnostic variations between archipelagos and cloth styles. One principal distinction is between the cloths of Tonga, Fiji, 'Uvea (and Rotuma, seemingly) on one hand, which were only pasted along the seams of the sheets (Figure 2.5), and the cloths of Samoa, Futuna and Niue on the other, which were pasted throughout to form a laminate material sandwiched together with starch. As a result, the two-layered cloths of Tonga and Fiji (especially when they are only small samples in museum collections) are often open at the side or will move independently between seams. Conversely, those of Samoa, Niue and Futuna are stiffer and often whiter. A distinctive feature of Tongan pasting was the addition of a third layer of feta'aki to produce exceptionally thick cloths. This was a key structural feature of the heavily glazed *ngatu 'uli* (black-decorated tapa) of Tonga around 1800, reserved for chiefly use and funereal purposes (Martin, 1817, II: 290).

Figure 2.5. Detail of pasted seam and rubbed decoration in Tongan ngatu tahina barkcloth (The Hunterian, GLAHM: E.417/8).

While the Polynesian arrowroot appears to have been the starchy tuber generally used in the zone of pasting composition, in early 19th-century Tonga it was a relatively recent replacement for the parboiled fruit of the *Melochia aristata* (*tou*) (Martin, 1817, II: 290). Arrowroot was itself largely replaced in Tonga and Samoa by taro (*Colocasia esculenta*) during the later 19th century, and by taro and manioc (*tavioka*, *Manihot esculenta*) in Fiji during the same period (Williams, 1858: 66). Presumably these substitutions were made largely for economic reasons, as it is well known that taro can yellow with age – something we find regularly on the seams of museum objects. The most notable variation in pasting between Polynesian societies is in the scale of the pieces composed: Fiji and Tonga are justly famous for their vast cloths of immense length, although the Fijian production of square cloths some 5m on a side (hung over beams to create room dividers) was also popular. In Samoa, Futuna, ʻUvea and Niue, conversely, cloths rarely seem to have exceeded 2.5m x 2.5m, and the production of vast presentation cloths in Tonga, Fiji and Rotuma seems to have arisen purely for ceremonial largesse. Equally, while patterned rubbing with *Bischofia* resin occurred only during pasting, it was by no means a universal element of pasting outside Tonga, and rather reflects a zone of historical Tongan cultural influence since the mid-16th century. There was considerable formal variation in the pattern boards and pattern-rubbed cloths from this central zone of the tropical South Pacific.

Phase 9: Textural finishing and conditioning

Nearly all accounts of tapa manufacture include a final period after completion in which the cloth is conditioned prior to use, storage or colouring. Most common is a traditional one-night exposure to softening dew (freshly beaten tapa stiffens as it dries), followed by a day's exposure to bleaching sunlight. Repeated over several days, this operation can have a profound effect on the cloth's whiteness, and especially in combination with saltwater soaking in Phase 2. Consequently, it is important to note that a heavily bleached *Artocarpus* cloth may be as white as an unbleached *Broussonetia* one. The pressing of the cloth was also important throughout Polynesia, and cloths were generally neatly folded into bolts and laid down under the multiple-layered mats of the bed for a prolonged period. Another textural finishing technique – historically documented only in Hawaiʻi, but likely much more widespread – was the burnishing of the tapa with a leopard cowrie or some other large smooth shell, rubbing in circular motions to reaggregate the loose fibres into the surface, and loosen up their lateral flexibility to make the cloth supple. These conditioning operations complete, all tapa was finished and ready to wear or store until needed. However, much tapa was destined for dyeing or painting, which several contributors to this volume address.

Phase 10: Post-completion reworking – pasting and re-beating

Essentially finished tapa was also reworked in several interesting ways to create new composite fabrics and garments, which are worth discussing here. As discussed above, the compositional pasting of Phase 8 has been widely described as a Western Polynesian technology in contrast to Eastern Polynesian fusing. The study of collections and historical sources makes it abundantly clear, however, that pasting was also extensively used in Eastern Polynesia to turn finished fabrics into several new forms. During the early 19th century, for example, male priests of Mangaia's Tonga'iti tribe (who traced their recent origin to Tonga) produced a thick white and cardlike ceremonial tapa (*tikoru mata'iapo*) – almost certainly a re-pasted cloth (Hiroa, 1944: 67). Similarly, those exquisite grooved and double-layered *kua'ula* cloths of Hawai'i which are generally red (or sometimes yellow) on one side and white or liner-stamped on the other, were entirely pasted throughout; indeed, it is notable that grooving does not seem to occur outside of the double-faced cloths, and we might hypothesise that grooving boards and tools initially developed as a methodology for effectively achieving this pasted unification neatly and concealing the inevitable wrinkles in the sheets.

Museum collections from the Society Islands (and its daughter-tradition on Pitcairn), as well as historical accounts of Tahitian culture between the 1760s and early 1800s, indicate that finished cloths of various kinds were cut and pasted together to create decoupage fabrics and garments. The most commonly encountered fabric of this cut and pasted type has a tiger-striped appearance where strips dyed a different colour along one edge have been laid like overlapping tiles, pasted and beaten to reconsolidate them into a single piece. They often appear as paired ornamental stripes down the breasts of Pitcairn *tiputa* ponchos.

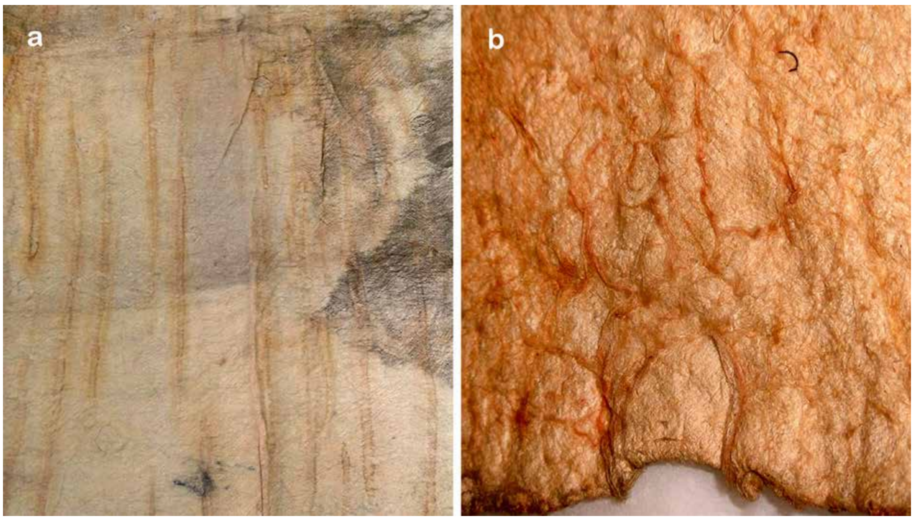

Figure 2.6. Pasted and re-beaten fabrics of the Society Islands and Pitcairn.

A particularly interesting technical family of Society Islands cloths is those termed here *rebeaten rubbed*, and which are best described in Tahiti by Johann Reinhold Forster (1778: 447) as produced from finished and once used *hopu* cloth: 'sometimes they make of such soft and fine cloth…several large layers which they join by a kind of glue, prepared from the root of the *Tacca pinnatifida*: these layers are again consolidated by beating again, rubbed, washed and softened, which operation makes it downy, smooth and warm'.[5] Given that *'ahufara* cloaks of this warm, soft fabric are among the commonest of cloths in museum collections from the late 18th and early 19th centuries, Forster's description shows that pasting was not even particularly rare in Tahitian manufacture. It is clear from the beautiful whorls in the arrangement of this fabric's fibre bundles, which often have circular holes at their centres in its outer layers, that the rubbing was performed with a small-diameter circular action of the hand when the rebeaten fabric was quite wet and the bundles themselves could be moved around and slip between one another. Given that a smooth rubber (such as the cowrie shells used in Hawai'i to burnish some styles of kapa) would reduce the pile and consolidate the surface, it seems probable that the tool was a rounded pebble offering some degree of friction; only a suitable experiment might indicate whether coral or basalt served best. It may be that food pounders served very well for such work, and no other tool was required. Nor is it clear whether the beating anvil was reused for this operation, a floor mat or some other surface. These fleece-like, re-beaten rubbed fabrics were made in several different styles, from three-layer cloths less than 2mm thick with a downy, velvet-like texture, to much thicker cloths of 5-6mm thickness where the rubbing process has been taken to such an extreme that the constituent layers are no longer discernible and the whole closely resembles a coarse woollen blanket (Figure 2.6).

Discussion

Through the ten foregoing phases, I hope to have provided the reader with a comparatively brief and relatively comprehensive overview of tapa's manufacture in Polynesia, frozen in an artificial but heuristic representational moment sometime around the turn of the 19th century. I have made a few observations above that perhaps warrant reiteration in conclusion. While Hiroa (1944: 429-434) made a strictly dualistic distinction between the tapa of Western and Eastern Polynesia as one of pasting versus felting, I have both advocated for the use of the term *fusing* as more accurate, and I hope to have shown that a minor tradition of fusing was to be found in Western Polynesia, and of pasting in Eastern Polynesia. Although there was a distinction between the Western and Eastern traditions of tapa making in Polynesia around 1800, this distinction truly lay in the perfection of the long bast soak and fermentation in Central Polynesia – probably the Society Islands – at some point during the first millennium AD (see Mills, Chapter 7). While pre-fusing was a basic technique of early beating common to all Austronesian barkcloth manufacture, it was this discovering of Moraceae bast's plasticity under chemical and mechanical treatment that revolutionised the possibilities of production in the central waters of the Pacific.

5 *Tacca pinnatifida* was the botanical name first given by the Forsters when they documented the *pia* or Polynesian arrowroot; it is now known as *Tacca leontopetaloides*. Shaw (1787: 5) or his printer incorrectly transliterated this as *Lacca pinnaisida* in the introductory text to his tapa albums, adding an early layer of confusion to the subject.

3

Breadfruit Tapa: Not Always Second Best

Michele Austin Dennehy, Jean Chapman Mason, Adrienne L. Kaeppler

Background

Low quality, inferior, greyish and secondary: these are some of the pejorative adjectives used to describe tapa made from breadfruit (*Artocarpus altilis*) in the historical record. Kooijman writes that breadfruit was '…primarily a source of food and only secondarily served for the production of tapas of lower quality.' (Kooijman, 1972: 3). Typically relegated to cloth for the poor or those of common birth, breadfruit tapa is generally described as not as white, not as soft and generally not as desirable as tapa made from paper mulberry (*Broussonetia papyrifera*). However, there is more to the story of breadfruit, elevating it to a more prominent status with an important ceremonial context.

The significance of breadfruit bark was recognised by early western explorers including Georg Forster, a young scientist travelling on Cook's second voyage with his father Johann Reinhold Forster. Georg wrote of breadfruit:

> That soft fabric from which each year a new layer of wood forms on trunk and branches or the same sapwood situated under the bark, is composed thus that the inhabitants of Taheiti were able to fabricate their cloth from it. They plant many young trees close together in loose soil and aim to groom them as straight as possible and without branches. In the next or third year they are cut and the sapwood is removed in the same way, prepared and made into Musslin-like cloth, as is customary with the sapwood of the paper mulberry tree…[1] Though these cloth feel a little more brittle than those of the aforementioned mulberry vine, in fineness they come close to them. (Forster, 1789: 427).

1 Here Forster gives his translation into German of Hawkesworth's *History of Voyages*, part 3, as reference. The description of the production of paper mulberry cloth is on p. 515 in the German text, Berlin 1775.

in: F. Lennard & A. Mills (eds) 2020: *Material Approaches to Polynesian Barkcloth. Cloth, Collections, Communities*, Sidestone Press (Leiden), pp. 61-69.

Many varieties of breadfruit are recognised for their fruit production, tree size, leaf type and the quality of the tapa manufactured from them (Plant Profile 2). At least one of the many varieties of Tahitian breadfruit is recorded as equal to or perhaps superior to paper mulberry in fineness and whiteness (Henry, 1928: 40). Henry notes, ‘The choicest white native cloth, called *pu‘upu‘u* [variety of breadfruit] in Tahiti came from the supple and profuse underbark of the young branches of the breadfruit tree, pu‘upu‘u.’ Henry also links this tapa with a sacred use (1928: 153). Some hint of the nature of this tree might be taken from the Tahitian meaning of pu‘upu‘u as ‘pimply and warped’ (Wahlroos, 2002: 642). Kaeppler concludes that the sacred white pu‘upu‘u was made from breadfruit bast by men and used in the *pa‘iatua* (ritual) on *marae* (sacred meeting places) for important occasions (Kaeppler, 2017b: 17). This periodic ritual was used primarily to renew the divinity of the *to‘o* (sacred sennit gods). The gods were assembled, their sennit coverings were removed, and they were re-dressed at a national marae for an important occasion such as the installation of a high chief, at seasonal ritual junctures, or at times of crisis. With the sennit covering removed, new pu‘upu‘u barkcloth, along with other fibrous materials, was placed in the covering, sometimes with a wooden object, rubbed with sacred coconut oil. Apparently pu‘upu‘u was one of the activating ingredients necessary to renew the divinity of the to‘o, with the prayers of the priest and the addition of red feathers (Kaeppler, 2007: 100-101).

Researchers are also confident that a similar type of high status barkcloth made from breadfruit was once produced in the Cook Islands to wrap sacred carvings (Chapman-Mason, 2017: 332). After tapa was replaced by European cloth, Koojiman notes, ‘Thereafter, the bark cloth required for ceremonial purposes was made from the inner bark of the shoots and younger branches of the breadfruit tree…’ (1972: 47). Writing about tapa in the Cook Islands, Gill notes, ‘Seven varieties of breadfruit are indigenous to Rarotonga; the eighth variety of breadfruit, until lately deemed sacred was brought from Tahiti by Tangiia, the chief of one of the two original bands of settlers’ (1885: 176). Today, there are about 12 varieties of breadfruit in the Cook Islands.

Many varieties of breadfruit are identified by Polynesians including Cook Islanders and Tahitians. In a survey of Tahiti and Mo’orea in the late 1820s, John Muggridge Orsmond, a missionary from the London Missionary Society who lived in Tahiti, recorded that Maohi distinguished about 40 varieties of breadfruit based on differences in the form of the fruit, the ways in which the fruit was best eaten, the time of year the tree fruited, or the suitability of the tree for making tapa cloth (Henry, 1928: 40-41). Between 1925 and 1927, the ethnobotanist Gerrit Parmile Wilder identified 32 varieties of breadfruit on Tahiti and Mo’orea and recorded the names of a further 27 varieties from various sources. Wilder found the rich and isolated nature of the localised breadfruit knowledge to be too daunting to penetrate. ‘The names given by Tahitians to the different varieties of breadfruit’, he confessed, ‘have been perplexing to me, as the same variety will sometimes be given different names in different localities and many names are seemingly synonyms. It has been somewhat difficult to procure reliable information and it takes much time and not a little patience.’ (Wilder, 1928: 20).

Dr Adrienne Kaeppler, Smithsonian Curator of Oceania, designed investigative fieldwork on the tiny lush island of Atiu in the Cook Islands and in French Polynesia on the island of Tahiti to try to answer her many questions surrounding the historical and current use of breadfruit in tapa production. The fieldwork included the identification and collection of several varieties of breadfruit used to make tapa today. Kaeppler also sought to determine if pu‘upu‘u was a recognised breadfruit variety on Tahiti, and possibly in the Cook Islands as well, in the hope of collecting this variety for study. *Tapa kuru* (breadfruit tapa in the Cook Islands) is still made intermittently on two of the Cook Islands, Atiu and Mangaia (Chapman-Mason, 2018: 13). *Tapa ‘uru* (breadfruit tapa in Tahiti) is no longer produced on Tahiti or in most of French Polynesia though the Marquesas and Mo’orea are exceptions. On Mo’orea breadfruit is used to make tapa for demonstrations and workshops. While breadfruit still grows widely on both the islands of French Polynesia and in the Cook Islands, paper mulberry has disappeared from the landscape (Ragone, 1991: 215).

Before organising the research trip to Atiu and Tahiti, Kaeppler discussed the breadfruit variety pu‘upu‘u with Diane Ragone, Director of the Breadfruit Institute at the National Tropical Botanical Garden in Hawai‘i. Ragone noted that she had not come across pu‘upu‘u during her own fieldwork in 1987, 2004 and 2009, although she had specifically asked about it. Pu‘upu‘u, collected by Steve Perlman in 1977, is listed as a variety in the breadfruit germplasm collection at Kahanu Garden, part of the National Tropical Botanical Garden. Perlman’s field notes record: ‘Rare variety, only three trees known in Huahine. Guide: Mr. Tapi Ruroa. Collected Fare Village, Chez Afong, Huahine.’ Ragone questions the provenance of this variety, now in their living collections. Collection of breadfruit leaf samples was a primary focus of the trip to Atiu and Tahiti; they were to be placed in the Smithsonian Herbarium for future DNA or other forms of scientific analysis. Smithsonian Botany staff member Nancy Khan gave the travelling group a tutorial on the best practices for the collection of breadfruit specimens including selecting the plants, pressing them and preparing them for shipment back to the Smithsonian. The group adhered to the published Smithsonian guidelines for collecting vouchers and tissues intended for genomic work (Funk et al., 2017).

Phase 1: Fieldwork on the island of Atiu

In late February 2018, we (Adrienne Kaeppler and Michele Austin Dennehy) flew to Rarotonga, Cook Islands to meet our colleague Jean Chapman Mason. On Atiu, a group of local experts, led by Atiuan tapa maker Patikura Jim, demonstrated current methods of manufacturing breadfruit barkcloth from harvest to finished product (Figure 3.1). Patikura Jim is a hat maker in the traditional style, using processed *kikau* (the immature leaves of the coconut palm) and she also practises other crafts including tapa, *tivaivai* (traditional quilt making) and pandanus mat making. She teaches tivaivai across Atiu and visited Australia to promote the practice to Cook Islands communities there. Patikura Jim’s grandson, Joshua Jim, provided a comfortable working area at Punarei in Ngatiarua Village. Other experts working with the local group included Atiuan elders George Mateariki and Teariki Tatuava, who helped harvest the breadfruit as well as discuss cultural history. George Mateariki is a keen environmentalist and the caretaker of Mokoero Reserve, a large tract of forest on the north-west coast of Atiu, which he protects from illegal use. Joy Jim, Patikura Jim`s daughter, who makes tapa and tivaivai for a living, also helped in the harvesting and the preparation of the breadfruit for beating. The work was also supported by Sauliloa ‘Loa’ Niumeitolu, project assistant and Mareta Atetu, officer of the Cook Islands Tourism Corporation.

Three varieties of breadfruit were discussed. One, *kuru enua,* is considered a ‘native’ breadfruit. Another, *kuru pa‘ea,* is thought to have been introduced in ancient times from

Figure 3.1. Patikura Jim demonstrating the beating out of the breadfruit bast to Adrienne Kaeppler at Punarei in Ngatiarua Village, Atiu.

Tahiti, specifically from the district of Pa'ea, to which many Cook Islanders have traditional ties. The third, *kuru Niue*, which is known to have been imported from the island of Niue in recent times, was also considered but there was disagreement as to whether it was actually kuru pa'ea, and therefore already present in Atiu. Diane Ragone collected the pa'ea during her fieldwork and its morphological characteristics and DNA analysis showed it to be the Samoan/Tongan variety Ma'afala.[2] All three varieties are used to manufacture tapa on Atiu.

The days started by cutting down breadfruit tree branches while recording botanical data, including location, associated flora and people present. We worked with George Mateariki to cut branches from both a small and large breadfruit tree on his property, Te Manava O Atiu, in the village of Areora (Figure 3.2a). Branches were also cut from trees on nearby Marae Karoariki, the Tatuava family marae. Next, a metal drum was filled with water and a fire lit beneath it. When the water started steaming, the cut branches were placed in the drum (Figure 3.2b). The group would then watch the proverbial pot boiling and wait until the bark separated somewhat from the branch. At this point the branch was pulled from the drum of boiling water and, while still hot, the outer bark was stripped from the inner bark (Figure 3.2c). The heating allowed for an easier separation between layers and reduced stickiness from the sap. The stripped inner bark was then beaten on a *tutunga* (wooden anvil) using a variety of hand-held *ike* (wooden beaters). Patikura described how traditionally, in a ceremonial custom before beating out the tapa, women would wash and

2 Personal communication, July 2019.

Figure 3.2. Harvesting the breadfruit: a) George Mateariki cuts a young breadfruit tree at his home in Areora, Atiu. b) Steaming the breadfruit branches before stripping. Punarei in Ngatiarua Village, Atiu. c) Mareta Atetu peels the breadfruit bark.

put oil on their bodies, and would place flower *'ei (*wreaths) on their heads. While some of the women beat the tapa, others would sing or dance, the beating of tapa generally being a communal activity. The anvil was raised with dry banana leaves placed under it; the hollow sound created by the gentle beating was an ideal accompaniment to the chanting and singing. Patikura recited for us a number of chants traditionally used during tapa making.

The bark was kept damp with a water spray bottle as it was beaten; the moisture level is critical as too much causes the tapa fibres to separate. After the tapa was beaten out it was dried in the sun. The breadfruit has a natural gradation of colour from off-white to a light reddish-brown. The colour is not influenced by the tapa maker; Patikura commented that it can be influenced by factors such as the age of the tree, the thickness of the limb cut, the soil the tree grows in, the variety of breadfruit being used and, sometimes, the wood the tutunga is made from.[3] If left out too long in the morning sun the tapa will become hard and unworkable. We learned from Patikura how the dried tapa is then ironed along the grain, first on the 'bad' side followed by a final ironing on the 'good' side. Before irons were available the drying period was much longer; the iron speeds up the drying process though it sometimes sticks.

Patikura Jim also described her work with *ava* (banyan, *Ficus prolixa*) which is boiled, beaten when wet and then dried in the sun. The group was surprised at the light colour of the banyan having only seen a more reddish *anga* (banyan tapa) produced previously. Again, the banyan cannot be left out too long as it too will harden. Depending on the desired colour, the banyan would be left out in strong sun for a very pale surface and in the later afternoon sun for a darker shade. We were told that banyan and breadfruit are both used for investiture garments but not together on the same garment. Kuru is considered harder than banyan and they are not typically joined together as the harder breadfruit will damage the banyan.[4] Patikura Jim recognised a good side to the beaten tapa and she wrapped them 'good side in'. Kuru pa'ea is best for tapa making and is referred to as 'land kuru'. She observed that all kuru is good if one is an experienced tapa maker since one needs to know how to make repairs. She commented, 'You have to play your part. I am a *taunga* (expert/teacher). You need to practise. You should not use glue for repairs. Rather you take a piece from the edge and beat it into the damaged area.' The young breadfruit is easier to work with and spreads more easily; however the older breadfruit, while more difficult to work with, has a more interesting mottled surface colouration, almost a grain, which is very desirable.

Today, baskets, hats, flowers and decorations are made from tapa but larger items such as *tiputa* (poncho) and *parekura* (chief's head-dress) are now only made for investitures, the ceremony that accompanies the appointment of *ariki* (chiefs). Embellishments are made by using contrasting colours of barkcloth; no dyes or designs are added. Traditionally the costume was not made with a pattern; a hole was cut in the centre and a tie was made for the waist. Patikura Jim makes her own individual patterns and uses a white glue to hold the costume together. During the week on Atiu the group also saw how *mati* (dye fig, *Ficus tinctoria*) bast was beaten out after Joy Jim stripped the bark from a living tree. It was interesting to our group that the mati was not boiled but was directly beaten out, resulting in an off-white barkcloth.

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3 The timbers traditionally used for tutunga were: *toa* (*Casuarina equisetifolia*); *kauariki (Terminalia glabrata*); *tamanu* (*Calophyllum inophyllum*). Tamanu will cause white tapa to turn a mild shade of pink.

4 This contrasts with '… and there he procured the *Aka-a-rangi* [a cloth made from the combined barks of the Breadfruit and the Banyan trees; the pattern traced on the cloth was called the Aka-a-rangi; *i.e.*, 'the branches of heaven']' (Te Ariki Tara'are, 2000: 181). This work is a reproduction of the publications by S. Percy Smith in volumes 7 and 8 (1898-99) and volume 27 (1918) of the *Journal of Polynesian Society* and is a translation into English based on a copy of Te Ariki Tara'are's original work which is believed to have been written in the 1860s.

We worked closely with Patikura over the course of our weeklong visit to Atiu. A community presentation was organised focusing on the Smithsonian's collection of Cook Islands materials. Enuamanu School, the only school on the island, also hosted our group with discussions of the stewardship of Cook Islands collections now in the National Museum of Natural History, using large-scale images of the collections.

Phase 2: Fieldwork in Tahiti

Next the group flew to Tahiti to investigate the breadfruit tapa in the collection of the National Museum of Tahiti and her Islands at Puna'auia. This includes large, very finely made breadfruit tapa from Marquesan tapa maker Suzanne Tetuanui-Peters, who has demonstrated tapa making in the museum over the years. Her breadfruit tapa are very finely made and are very thin, but strong and uniformly beaten out with fine parallel beater marks. Kaeppler examined the tapa holdings including contemporary costumes. A very white lacy tapa trim was identified as *'uru pae'a* (breadfruit variety) by museum staff (Figure 3.3). This tapa looked very different from the kuru pa'ea tapa we saw in Atiu. The processing method used in the manufacture of the tapa is not in the museum collections records, though the person who created the costumes might still be located in Tahiti. Surprisingly, the Director of the Museum Manouche Lehartel said that while she knew of about ten varieties of breadfruit, all for eating, she did not associate the word pu'upu'u with any variety of breadfruit tree.

Figure 3.3. Detail of costume (National Museum of Tahiti and her Islands). The white, lacy, gathered frill around the lower edge of the hat, and the detached part at the bottom of the image are the components made of breadfruit.

Figure 3.4. a) Jean Chapman Mason tries beating out the inner bark from a breadnut branch (*Artocarpus camansi*) overseen by Hinano Murphy, Vaiurua, Tahiti. b) *Camansi* fruit and leaves look very similar to breadfruit although the bast was useless for tapa.

Our next visit was to the home of ‘Quito’ Enrique Braun-Ortega in the remote Vaiurua Valley on Tahiti-iti. Accessible only by boat, the property is an 800 hectare conservancy for the indigenous and endemic plants of Tahiti including breadfruit. Braun-Ortega has focused his efforts on acquiring the many varieties of breadfruit recorded in the literature as found in Tahiti. He has not been able to locate the pu‘upu‘u variety described in historical documents although he hopes he will be able to locate it in the future through continued outreach, if it does indeed still exist. Other colleagues joining the visit included: Hinano Murphy, tapa maker and President of Te Pu Atitia (Atitia Center) and the Associate Director of Administration and Outreach at the University of California, Berkeley, South Pacific Research Station in Mo‘orea, French Polynesia; her husband, Francis Murphy, who is the director of the Research Station; Jean-François Butaud, Consultant and Forest Engineer; and Heinui Tatiaru, school teacher and our driver.

While on the property the group tried to beat out the inner bark from a branch of a breadnut tree (*Artocarpus camansi*) which is in the same genus as breadfruit (Figure 3.4). It was clear that this tree was not easily processed for tapa; it was difficult to separate the bark from the branch and the outer bark from the inner bark. Hinano Murphy discussed many factors believed to influence the workability of varieties of breadfruit including seasonal influences and monthly cycles such as the phases of the moon, all of which were taken into consideration before harvesting for tapa making. Hinano also explained that Tahiti was unique in the practice of leaf printing designs on tapa. The *ana‘e* (king fern, *Angiopteris longifolia,* now known as *Angiopteris evecta*) was also used to ‘imprint’ a pleasant scent on tapa. Discussions with our colleagues while visiting Braun-Ortega`s conservancy also included the use of the root of the *pia* plant (*Tacca leontopetaloides*) as an additive to the barkcloth to serve as a natural glue and insecticide.

Hinano Murphy was not familiar with the pu‘upu‘u variety of breadfruit, but if it is still a viable variety, she thinks it might be found on Ra‘iatea. On our return to Puna‘auia, we stopped at Arahurahu marae as it seemed possible, given the best tapa was reserved for the *ari'i* (chiefs) and *atua* (wrapping idols) placed on the marae, that the pu'upu'u might be found at such a place. The trees were not bearing fruit at that season but we saw an unusual breadfruit tree with naturally misshapen leaves which we documented for future analysis.

Identification of tapa made from breadfruit varieties is complicated by multiple factors. The variety of the breadfruit tree used to produce the tapa appears to strongly influence physical characteristics such as colour, looseness of fibres, thickness and probably other properties. The age of the shoots and branches also plays a role, as the older and thicker part of the tree has more colour and grain. Sun bleaching also plays a role in achieving the desired shade. In the future, if Braun-Ortega is successful in obtaining the pu'upu'u variety of breadfruit, and with advances in analytical techniques, it may be possible to reconnect tapa now in museum collections to their once sacred status. The research also relies on techniques that enable the botanical identification of tapa in collections.

Two packages containing the pressed breadfruit samples, one from Atiu in the Cook Islands and one from Tahiti, were sent to Nancy Khan at the Smithsonian. They are now part of the Herbarium collection and will be available for future research.

Conclusion

After the preparation and fieldwork, and consultation with a variety of academics and indigenous people, some parameters have been established. We are convinced that pu'upu'u is not a widespread or known variety of breadfruit, at least today, and perhaps never was. Although the literature about Tahitian tapa records that the pu'upu'u variety of breadfruit was preferred for religious and chiefly purposes in the past, that knowledge is no longer held by the Tahitians we met. Similarly, in the Cook Islands, there is scant information about which variety of breadfruit was preferred for making the tapa used in costuming the chiefs and gods. It is known that there was a 'sacred' variety although not what that is, or whether it still exists. In the case of Tahiti, at least, it may be possible to identify pu'upu'u today if one were able to confidently identify old Tahitian tapa extant in museum collections as being of the pu'upu'u variety. We may have to conclude that pu'upu'u is a breadfruit known to us already but now by a different name. But if no variety should match a tapa, we will know we are looking for something that did exist but cannot now be found, and our search for this once revered tree must continue.

Kaeppler tentatively concludes that for some unknown reason a specific variety of breadfruit became special. Perhaps, a god brought it from one of the levels of the sky, well known in Central Polynesia. Perhaps it had an unusual texture or was shiny white. Perhaps the prayers of a priest added a specific quality that was perpetuated in a special soil enhanced by a meteorite or a one-off event. It is possible that a reference in a chant or story is waiting to be uncovered. For now, we can safely say that a special kind of breadfruit was a container of divinity and we will continue to search for it and to discover why that was the case.

Acknowledgements

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~ Plant Profile 3: Fibre ~

Pacific banyan *Ficus prolixa* G. Forst.
MORACEAE

Mark Nesbitt

Left: Branches and fruits, Marquesas Ua Huka, Hanahouua, French Polynesia, 2004.
Right: M. Balansa 3024, New Caledonia, 1871 (Kew, K001050998).

The Pacific banyan is a large tree (to 40 metres or more), named after its 'banyan habit', with large numbers of aerial roots reaching to the ground as the tree climbs and strangles the host tree. It is native to Micronesia and throughout much of Polynesia, but not Hawai'i or Aotearoa New Zealand. It grows wild in lowland forests, and is now threatened on some islands by their clearance. There are several records of its use as barkcloth at the time of European contact, but with no evidence of its cultivation it was probably a scarce material. As discussed in Chapter 1, it often had sacred and chiefly associations, perhaps because of its scarcity. The small-leaved fig (*Ficus obliqua* G. Forst.) is more common in Micronesia and western Polynesia and was also used as barkcloth.

Vernacular names (selected): Samoa, Futuna, Cook Islands: *āoa*; Tonga, Niue: *'ovava*; Society Islands: *ora*.

~ Plant Profile 4: Fibre ~

Māmaki *Pipturus albidus* (Hook. & Arn.) A. Gray ex H. Mann URTICACEAE

Mark Nesbitt

Left: Andy Mills with young māmaki tree, Waika Gardens, Oahu, Hawai'i.
Right: Frederick W. Beechey, HMS Blossom, 1825-6 (Kew, K000741520).

Māmaki is native to the islands of Hawai'i, and is an endemic species, not found outside Hawai'i. It is a small tree, up to 6 metres tall, growing in wet forest from sea-level to 2000 metres. It has glossy, large leaves, and edible fruits. As with many members of the nettle family, such as the better known *'ālena* (*Touchardia latifolia*), the inner bark is strong and has a history of use as cordage. Its role in barkcloth is more cryptic. Ethnographic records record that it was used for barkcloth on the island of Hawai'i, and mixed with *Broussonetia* bark on other islands. Scientific analysis and visual survey of museum collections has identified a very small number of barkcloths that comprise a *Broussonetia* and māmaki mixture of fibres (Smith et al., 2019). Experimental work by Lisa Schattenburg-Raymond suggests that māmaki was used to make double-retted fibre, *pōpō* (Chapter 4). Ethnographic records suggest that it was never cultivated; it was likely harvested as young stems from the forest.

Another species, *Pipturus argenteus* (G. Forst.) Wedd. is an abundant wild tree in Polynesia, with inner bark widely used as cordage.

4

A New Perspective on Understanding Hawaiian Kapa Making

Lisa Schattenburg-Raymond

Hawaiian *kapa* (barkcloth) is one of the most diverse forms of fabric in the Pacific. Collections in museums around the world have an amazing variety of materials, textures, colours, and patterns. Unfortunately, much of the knowledge regarding how ancient kapa was made is sparse or incomplete. The decline of kapa making began with the influence of the Puritan missionaries arriving in 1820, when Hawaiians were encouraged to adopt western style clothing to cover their perceived nakedness. By 1850 few Hawaiians were wearing their native dress in urban areas, and by the end of the century almost no one was making kapa. By the early 1900s when Brigham was compiling the comprehensive work on tapa cloth, *Ka Hana Kapa* (Brigham, 1911), he was only able to consult a few elderly informants. It has been a lesson in frustration attempting to replicate museum collection kapa by following methods explained in the literature or passed on orally. However, through my independent research, progress toward replication is advancing.

'Ma ka hana ka ʻ*ike* – In doing one learns' (Traditional proverb).

In my early efforts to consistently recreate the kapa I saw in museums, I was rarely satisfied with the way my pieces turned out. They often had holes or weak areas, or were thick and as stiff as cardboard. Importantly, they lacked the strength and flexibility that I saw in the museum specimens. It occurred to me that, if thousands of Hawaiian women were making kapa and their kapa was consistently high in quality for over a thousand years, there must have been some standardised processes that efficiently used their time and resources. I realised that I needed to reconstruct those processes to find out how they accomplished this. I set about examining every historical document I could find in both English and Hawaiian, while also trying the various methods of kapa making discussed in the literature. During my research, I became aware of sometimes conflicting accounts by early explorers on the one hand, and practitioners on the other. Many of these have then been reprinted in modern publications. One reason that some of the accounts contradict each other is that they were sometimes describing different processes as if there was only one method. In fact, there are at least three methods for manufacturing kapa with *wauke* alone (*Broussonetia papyrifera,*

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Figure 4.1. a) Wauke nui with large thick leaves. b) Poʻaʻaha with ovate leaves. c) Wauke mālolo with deeply lobed leaves. d) Individual leaves. Left to right: wauke nui, wauke mālolo and poʻaʻaha.

paper mulberry), the variations depending on the type of wauke used, the age of the wauke at harvest, and the length of time for which the fibres are retted.

Another key cause of confusion is that there has never been a documented examination of the wauke varieties used, aligning the plant with its product in a way that historical Hawaiians surely did. In reconstructing and working out these various processes, I have been astounded at their efficiency; the economy of motion and resources inherent in each phase. This article cannot address the vast range of kapa lore, and so it focuses on two aspects of kapa making that I believe most urgently need a new perspective: I will clarify several distinct varieties of wauke grown in Hawaiʻi that differ from *Broussonetia papyrifera* found in other parts of the Pacific, and I will explain some distinctive Hawaiian methods of processing and making kapa as I have come to understand them.

Varieties of wauke (*Broussonetia papyrifera*, paper mulberry)

Hawaiʻi has three distinct varieties of wauke which have been documented in the literature (Meilleur, Maigret and Manshardt, 1997): w*auke nui*, po*ʻaʻaha*, and w*auke mālolo* (Figure 4.1). I believe I currently have the only living collection of these three

Figure 4.2. Retted kapa with fine beater mark in the pūʻili pattern.

varieties growing together. Like other island groups around the Pacific, isolation and selection have produced certain varieties unique to Hawaiʻi. The Hawaiian varieties share the characteristic of having reddish veins and leaf stems, a trait most noticeable near the young growing tips. There are two leaf types: the poʻaʻaha has ovate leaves and wauke nui and wauke mālolo have lobed leaves. The wauke mālolo has deeply lobed leaves resembling a flying fish which it is named after. This is confirmed by the Hawaiian literature: 'Wauke has fingered leaves (*lau manamana*) and poʻaʻaha has round leaves *(lau poepoe)*' (Stokes, n.d.).[1] Two other non-Hawaiian varieties are also found in Hawaiʻi: a three-lobed Samoan variety which is a light yellow-green and has bark that splits and scars easily, and a lobed leaf Asian type of unknown origin.

Since the 1960s resurgence of Hawaiian kapa making, there has been some confusion concerning which of these *Broussonetia* varieties now growing in Hawaiʻi are truly Hawaiian. The only variety grown in Hawaiʻi which possesses male flowers is an imported Asian variety that was introduced during the mid-20th century; it was dubbed w*auke manamana lima* (finger-like wauke) by master craftsman and kapa mentor Dennis Kanaʻe Keawe due to its deeply lobed leaves.[2] This Hawaiian nickname may have contributed to some practitioners, and others, believing it was a traditional Hawaiian variety, but this is not the case. As this Asian variety has been cultivated for paper-making, its fibres are stringy and its colour is off-white – quite unlike Hawaiian wauke. In fact, one of the main

1 Personal communication, Kalokuokamalie.

2 Personal communication, Dennis Kanaʻe Keawe. The first voucher accession at the Bishop Museum was 1965. This introduced variety may be the male population identified on the basis of DNA analysis as a historic introduction to Hawaiʻi by Olivares et al., 2019.

Figure 4.3. Waili‘ili‘i kapa showing the fibre structure.

Figure 4.4. a) Using the papa hole grooving tool. b) Detail of grooves on a malo.

challenges in trying to reproduce the qualities of traditional Hawaiian kapa has been that we practitioners have often been using non-Hawaiian varieties without understanding that there are fundamental differences in their fibre quality, colour and intended function. For the last ten years I have collected, grown, and used all these varieties in my kapa making and carefully observed their different characteristics. The following kapa making descriptions are based on a reconciliation between the available accounts in the historical literature and my own experience as a practitioner. The names are based on Kamakau's descriptions of kapa making (1976: 108-116).

The harvesting and preparation of wauke

The bast (or inner phloem) fibre of the plant is harvested when mature, at 18 months or more in age. At this age, the trees are approximately 12-15 feet (4-5m) tall, with the usable lower part being approximately 7 feet (2m). The top branches and leaves are discarded. The outer bark is slit longitudinally and peeled from the woody stalk. The inner bast is then separated from the outer bark. If the bark is to be softened or a particularly white kapa is required, it is coiled up and soaked in salt water for seven-ten days to ret and bleach. Then the bast is soaked in fresh water until the required maceration has occurred. If the kapa does not need to be white, the bast is soaked in fresh water from the outset. Although fine paper-like kapa is not unique to Hawaiʻi, the incorporation of beater designs is sometimes considered to define kapa as 'Hawaiian,' and creating the kind of kapa that will take such a beater mark demands retting the fibre (Figure 4.2). Retting involves soaking the bast in water until the inner phloem fibre bundles undergo fermentation and become soft. Some kapa-makers colloquially call this entire process 'fermentation'. In the retting process, bacteria that occur naturally in the environment enter the bast and begin breaking down the connective tissue which consists of pectin and mucilaginous substances; this helps to loosen and soften the bast fibres. The process can take several days, weeks, or months depending on the age and type of bast used and the temperature of the water. The action of these bacteria in retting makes the bast very foul-smelling and the bast is dried and bleached in the sunlight to remove this odour.

Varieties of kapa and kapa processing

Something which has seen scant attention in the historical literature on Hawaiian kapa-making is the fundamentally different processes of manufacture leading to the production of different kinds of kapa. Here I will discuss four main processes, each of which relate to the bast and the plant variety in a different way.

Wailiʻiliʻi kapa

In the *wailiʻiliʻi* process, the bast is beaten out immediately after it is harvested and stripped. No soaking or additional water is needed, no retting is involved, and the moisture naturally contained in the bast is sufficient to enable its working (Figure 4.3). Wauke nui is the main variety used for this because its fibre is very white and strong, although poʻaʻaha also works adequately and may be used. Wailiʻiliʻi literally translates as 'a little water'. This process is used to make *malo* loin cloths, *pāʻū* skirts, *kīhei* shawls, and *kapa moe* sleeping blankets. When beating out a stalk of wauke in this fashion, the finished length of the sheet will be 7-10 inches (18-25cm) shorter than its original height because the horizontal beating outwards of the fibres results in a shortening of the length. To make larger pieces a secondary process called *kuʻikuʻi* is then undertaken, overlaying and beating the edges together with new pieces, either at the edge or along the length. The individual wauke strips can be dried and dyed before being beaten out and combined into larger pieces. Because the original structure of the bast fibre bundles is retained in this process, wailiʻiliʻi kapa were washable and wore well. On the whole, this method is similar to the tapa making processes of other parts of the Pacific.

Figure 4.5. a) Dried and soaking moʻomoʻo. b) Dried moʻomoʻo.

It is wailiʻiliʻi kapa which are sometimes grooved with a special grooved board called a *papa hole* (Figure 4.4). The grooving is done (usually for making a malo or pāʻū) after the fabric has been dyed and patterned, and is done when the kapa is dry, not wet as was incorrectly reported by Hiroa (1957: 186). The kapa is first laid upside down over the papa hole and a bamboo ruler is used to press the fabric into the first groove; then a tool similar to an ice-skate blade is pressed into a second adjacent groove and slid back and forth to compress the fibres into shape. The ruler continues to hold the kapa in position, while subsequent grooves are pressed; this grooving work goes pretty quickly and results in a much more supple kapa. If you attempt to stamp or pattern the kapa after it has been grooved, the decoration will be much more difficult to apply onto the uneven surface.

Kapa moʻomoʻo

Understanding the construction of this type of kapa was one of my most exciting epiphanies as a kapa-maker. I first began to understand it when I had the chance to observe the conservation of some kapa moe that had been damaged by seawater in a 2011 tsunami. The kapa had been immediately frozen and then carefully dried before conservation could take place. One of the kapa moe was constructed of two sheets that had a patch of glue spilled on them in the past. When the two sheets were pulled apart, a thin micro-layer of kapa was pulled away from the lower sheet with the glue. I was intrigued by this development and once I began to understand the more complex structure of this type of kapa, I began working towards reproducing a technique that could achieve it.

Moʻomoʻo are paired, retted strips of wauke that are beaten together throughout. The production of moʻomoʻo is an interim step in some kapa making processes. Although other island groups such as the Society and Cook Islands made fine retted barkcloth, moʻomoʻo may be an invention unique to Hawaiʻi. Wauke stems are naturally thicker at the base and thinner at the growing tip, but pairing them up can even this out. They are paired by length and age, then the bast strips are placed one on top of the other; tip to tail and front to back – the inner side of the bast being somewhat stickier, and having finer fibres, than the outside. This allows the two strips to mesh together easily. Using a grooved *hohoa* (round wooden beater) on a *kua pōhaku* (stone anvil), the paired retted strips are beaten up one side and then turned over and beaten back again on the opposite side. In this moʻomoʻo process, the grooved beater held at a natural angle with respect to the bast will separate the fibres in an efficient criss-cross pattern. In addition, the curve of the rounded beater separates the fibres and pushes them outwards. An *iʻe kuku* (lined square-sectioned beater) cannot accomplish this as easily as the rounded hohoa.

This separation of the fibres allows for better bleaching in sunlight, and prepares the fibre for subsequent beatings. While sun bleaching, again, eliminates the foul odours of retting and bleaches the bast, the resultant sun-dried strips can also be stored for years. This process efficiently focuses time and energy: in one day, one can harvest a large number of wauke stalks; the next day, one can strip and pair them for retting. In a few weeks, when they have finished retting, the paired strips can be beaten out into moʻomoʻo and dried. Therefore, when one needs to make some finished kapa item, the materials are ready (Figure 4.5). This process not only simplifies the work but adds significant strength to the kapa; Pang (1992) noted that *Broussonetia* fibres that have never been dried tend to be longer than those that have, and this has also been my experience. The drying significantly shrinks the fibre, and it also improves the fabric's overall strength. This makes the kapa both easier and faster to beat than retted fibre which has not been dried.

My research and experimental experience allowed me to understand the materials' science of why retting and drying are important processes. Each strip of bast is made up of a microscopic network of fibres, similar to the way the strings of a fishing net are bound. When two strips are paired to make a moʻomoʻo, each network meshes on top of the other, creating very thin micro-layers while still keeping its structural integrity. When multiple, stacked moʻomoʻo are beaten out, increased structural integrity is created which greatly contributes to the strength and durability of the kapa. The poʻaʻaha is the preferred *Broussonetia* variety used for this type of kapa as it is retted more readily than the wauke nui.

Each individual strip of wauke bast will produce approximately 6-8 inches (15-20cm) of finished kapa and one moʻomoʻo will provide approximately one foot (30cm) of completed kapa. When a *loea* (skilled practitioner) wants to make a certain size of kapa, she selects the number of moʻomoʻo she will need to meet the requirement of the completed kapa. When making moʻomoʻo, it is important to create standardised lengths of wauke which are of equal thickness throughout. An *anana* is the Hawaiian term for the unit of length from fingertip to fingertip of outstretched arms; approximately six feet (1.8m) or a fathom. This seems to be the standard length of moʻomoʻo. Perhaps Hawaiian women in history did as I do, using my six-foot *kua* (wooden anvil) as a handy surface to measure, pair and arrange my bast strips for making moʻomoʻo. This standardisation of moʻomoʻo length allows the kapa maker to easily create whatever size or shape of kapa is desired without having to piece and patch small pieces together. This, too, quickens the laborious process of kapa making.

Every moʻomoʻo created from a pair of 18-month-old poʻaʻaha saplings makes approximately six feet of kapa one foot wide, so a 12-foot by 24-inch pāʻū skirt (3.6m x 0.6m) would require four moʻomoʻo. Two moʻmoʻo beaten together and then the end edges overlapped and the two joined would complete a woman's simple pāʻū. Sheets for kapa moe and kīhei are approximately six-seven feet square (1.8m x 2.1m). The loea would select six moʻomoʻo to make one of these. The lengths are trimmed to equal size, one anana, or longer if desired. They are then re-soaked, stacked together, and beaten out until the desired size and thickness is reached. During the beating process the bast lengthens slightly and broadens as it thins. The size of the kapa will always be limited by the length of the shortest moʻomoʻo. If the moʻomoʻo are not all the same length, the finished piece will be of an irregular shape. This kapa is used for kīhei, pāʻū and kapa moe. It is supple, long wearing, and strong enough to tie.

Pōpō

This process involves the use of double-retted fibre. *Pōpō* can be translated as 'ball' or any other round mass, and also as 'rot'. As the kapa-maker Wahineaea described to Stokes (n.d.), 'The moʻomoʻo is soaked in fresh water and wrapped in noni leaves. Left in the sun for a week or 10 days, moistened by sprinkling; turned over, similar time and treatment. Must start a ferment as the material sours. Then done up in laʻi [*Cordyline terminalis* leaves, now known as *Cordyline fruticosa*] and moved to shelter of house from one to two weeks until fibres break readily. Then divided into balls (pōpō) according to number of sheets wanted.' A second method of pōpō involved tearing and shredding, then re-retting, small scraps and leftover bits of wauke or older used kapa. This kind of kapa required an additional binder to hold these degraded fibres together. Binders such as *palaholo* mucilage (from the *amaʻu* fern, *Sadleria cyatheoide*s, now known as *Blechnum cyatheoides*) or m*āmaki* (*Pipturus albidus*) were the most common. I find this method more difficult than the moʻomoʻo style because the finished size is determined by the length and number of strips used. In the pōpō style, you have to shape and form the size of the kapa as you proceed. Also, because the fibre lengths are so short, the kapa is much more fragile and difficult to move on the kua as you work. This type of kapa lacks the structural integrity of the waili‘ili‘i and mo‘omo‘o styles, and was primarily used for kapa moe or pā‘ū where multiple, delicate sheets were sewn together along one edge. It was not suitable for use in producing malo. Kapa moe sheets were sewn together and did not have to be tied, so they did not have to withstand that kind of stress. The Hawaiian fabrics produced from the bast fibres of māmaki (*Pipturus albidus*), *‘ākia* (*Wikstroemia uva-ursi*) and *‘ulu* (*Artocarpus altilis*, breadfruit) were all made in this way, and their often-cited somewhat inferior qualities largely resulted from the structural weakness inherent in the pōpō process.

Kapa pa‘ūpa‘ū

Its name meaning ‘lightly-tapped while moist’ (Pukui, 1986: 321), *pa‘ūpa‘ū* is an overlaid kapa which had to be moistened to work it. It was greatly prized for its strength, durability and warmth; such kapa were thicker and used in cold weather. A partially-beaten coloured sheet would be laid over a white sheet and the two beaten out together into one sheet. Manufacture of this kapa obliges you to use the mo‘omo‘o method because the constituent micro-layers will keep the two colours separate. If you try this with the *pōpō* style, for example, the upper colour will beat into the lower white sheet and ruin the effect.

Conclusion

Hawaiian kapa making is a complex art requiring deep knowledge in the practices of botany, horticulture, chemistry, biology and engineering. In the 20 years I have been studying Hawaiian dyes and kapa making, I feel I am just now beginning to grasp these different processes. Reviving and distributing the three Hawaiian cultivars is a current priority, because we cannot make Hawaiian kapa without Hawaiian wauke. Experimental kapa making has been a vital part of the process of understanding traditional techniques which had died out. Researching the documentary sources has also been critical, but it is only through achieving a practical understanding that it has been possible to identify the different techniques used. This has helped to unravel the confusing information passed on by early explorers who did not understand that not all kapa was made in the same way. Being able to understand the qualities and limitations of the various types of kapa will help us to revitalise and focus our efforts to make kapa live again. It is my hope that better understanding of these processes will speed the revival and improve the quality of kapa making in Hawai‘i. More work needs to be done, and this journey is not over. What will the next 20 years bring? *E ola ka hana kapa*! Kapa making shall live on!

5

Polynesian Tapa Colourants

Andy Mills, Taoi Nooroa, Allan Tuara

If we consider the use of tapa pigments across Polynesian cultures as a set of historically related traditions, we find that certain key pigments were widely shared, and that there are also major groups of closely related pigments. Understanding the regional distributions and historical relationships of these can help us to interpret the cultural history of pigment in Polynesia. Colourant production throughout Polynesia is rooted in a broader cultural substrate of traditional ecological knowledge: the techniques and technology of materials processing, which historically informed foraging and horticulture, as well as the production of food and beverages, medicines and poisons. As in many other parts of the world, the prehistoric discovery of some pigments was most likely incidental to their more obvious use as foodstuffs. The discovery of others, conversely, demands that we understand ancient Polynesia's early settlers as conducting systematic experimental investigations into the properties of most (or all) of the plants available in the environment. For instance, the combination of processed materials in the production of some red or black pigments discussed below could only have been achieved within a cultural framework of experimentally exploring the reactive properties of every part of many species, and committing them to memory, alongside their interactions with one another.

Existing lists of named historical tapa types indicate that their colour (and colouring methods) were often intrinsic to their classification. The organisation of this discussion, however, primarily differentiates pigments into groups on the basis of the plant parts used, because this explains their regional history more clearly. We do not address the many pigments unique to Hawai'i in this discussion (see Schattenburg-Raymond, Chapter 6), focusing instead on those also produced elsewhere in Polynesia. Mineral and imported European pigments are also discussed briefly towards the end of the paper. In general, however, historical Polynesian pigment production was heavily plant-oriented. While the sources and extraction methods of many Polynesian pigments were fairly well documented in the 19th century, their finer details were often not. Thus, many pigments are described as 'brown', 'red' or 'yellow' without any details of their differences – or culturally-specific variations in classification – and several sources were often used concurrently in the same place to produce a given colour. Some processes of pigment extraction have not been performed for several decades; in certain cases, a century or more. As part of the

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research leading to this chapter, we therefore undertook experimental reconstructions on Mangaia (Cook Islands) in November 2017 to determine whether some of these details might be rediscovered. Mangaia retains good populations of several traditional pigment plants; it was one of the last islands of Central Polynesia to abandon tapa production in the early 20th century (see Hiroa, 1944). It has recently seen a renaissance in tapa making; and it has a healthy tradition of Māori medicine keeping local plant lore (as well as the people) thriving and well.

Brown and red pigments from tree sap

Brown, red or intermediate pigments derived from the tannin-rich sap of trees were very widely distributed across the whole of Polynesia. They were (and are) also the most popular pigments in Western Polynesia. Sap-pigmented cloth (in one form or another) was produced everywhere in Polynesia except the Marquesas Islands, Rapa Nui, and Aotearoa New Zealand (Kooijman, 1972). Across this vast area, sap was extracted from ten documented tree species, although four principal trees were exploited across large sections of that range.[1] In descending order of widest distribution, these four were *Aleurites moluccana* (*tuitui, tutui, kukui*, candlenut tree); *Bischofia javanica* (*koka*, *'o'a*, *tea*, bishopwood); *Rhizophora mangle* (*togo*, *tongo*, one of the mangroves); and *Casuarina equisetifolia* (*toa*, *aito,* ironwood).

On one level, the large number of species used regionally can be understood as substitutions for one another necessitated by their shifting availability from place to place. On another level, however, these saps vary considerably in their hue, tone, gloss and viscosity – although all can be broadly described as 'brown' or 'red' in English. Sadly, their qualitative differences are not all known, as many of them were incompletely documented before use was discontinued. Where they are known, or experimental reconstructions can provide some insight, they are described here. In combination with knowledge of a pigment's distribution of use (see Table 5.1), and a cloth's origin, these details can often identify the pigments used on a fabric.

Only some of these saps are resinous; others are watery, syrupy, or latex-based. Some have been erroneously described in European sources as extracted from the bark of the tree, but all four of the main colourants listed above are primarily extracted from the outer sapwood (secondary xylem), with only a minority of liquid coming from the bast, and probably none at all from the cortex. The cortex is the dry, sapless outer bark of the tree, and resinous sap is generally produced and transported in the outer wood (Capon, 2010: 64-65). Sap extraction is a destructive process, and artistic practitioners from Samoa and Tonga (where *Bischofia javanica* resin is still regularly extracted for pigment) emphasise that trees must be carefully managed to avoid killing them and maintain the resource for future use. The primary function of bast is the transmission of sugars around the tree from the leaves, and therefore ring-barking the entire circumference at any point will kill almost all trees. Therefore, sap is best extracted from only one side of the tree,

1 The other documented Polynesian species providing sap-based pigments include a red paint in Samoa extracted from the *pani* tree (*Metrosideros collina*, a relative of the New Zealand *pohutakawa*); on Rotuma, a brown resinous pigment from the *ifi* (*Inocarpus fagifer*, the Polynesian chestnut); a weak brown from the *piri piri* of Tahiti (probably *Urena lobata*, although several unrelated species are classed as one form or another of *piri piri*); as well as two Hawaiian species, a yellow from *holei* (*Ochrosia compta*) and a pinkish red from *kōlea* (*Myrsine lessertiana*).

Locality	*Rhizophora mangle*	*Bischofia javanica*	*Aleurites moluccana*	*Casuarina equisetifolia*
Fiji	✓	✓	✓	
Tonga	✓	✓	✓	
Samoa	✓	✓	✓	
‘Uvea	✓	✓	✓	
Niue		✓	✓	
Futuna		✓	✓	
Cook Islands		✓	✓	✓
Society Islands			✓	✓
Austral Islands			✓	✓
Mangareva			✓	
Hawai‘i			✓	
Source: Kooijman (1972).				

Table 5.1. Use of the four commonest resinous tree saps as reddish-brown colourants, by locality, circa 1850.

leaving the remaining bast to support the plant until the wound can heal. The extraction of *Bischofia javanica* in Western Polynesia is well documented, and as it is the dominant brown pigment used on Tongan *ngatu*, its colour can easily be observed in museum collections – and is at any rate still well known to be a matt, chocolate-to-earthy brown (see Veys, Chapter 11; Veys, 2017: 42). The colour of *Rhizophora mangle* sap is not described in historical sources better than a ‘reddish-brown’, although it is known to produce a glossy varnish similar to *Aleurites moluccana* described below (see Chapter 9, Figure 9.5).

On Mangaia in 2017 we extracted sap from both tuitui (*Aleurites moluccana*) and toa (*Casuarina equisetifolia*). This showed us that, despite there being a rich reddish-brown colour visible in their inner barks, no pigment can be extracted, while the outer wood is full of resinous sap of exactly the colours found on tapa. In both cases, a bush knife was used to shave off a large area of the trunk’s outer bark around approximately 150° of its circumference. Once barked clean, the outer 5-10mm of sapwood was shaved off onto a tray as a coarse sawdust (Figure 5.1a). *Aleurites* shavings have a darkish burgundy-brown colour, while the *Casuarina* shavings are a surprisingly bright raspberry-red colour (Figure 5.1b). Only older trees seem to yield an appreciable quantity of sap, and older trees also give a darker sap. Approximately 1kg of shavings were collected from each species. Each set of shavings was moistened slightly and wrung out firmly using a coarse muslin to produce about 500ml of each liquid. In the Cook Islands, *Aleurites* extract was historically known as *vavai‘iri* and *Casuarina* extract termed *toto* (blood) (Figure 5.1c). Both extracts continue to be used in Māori medicine today, and therefore we must understand their historical production as pigments to be merely one aspect of a more thoroughgoing system of organic resource production integral to the technological base of Polynesian civilisation.

Both extracts were slightly sticky and resinous, but the vavai‘iri from tuitui significantly more so. Their colours mirror that of their shavings: the tuitui produces a burgundy-brown (Figure 5.1d), and the toto from *Casuarina* a bright raspberry-red, characteristically pinkish (Figure 5.1e). Vavai‘iri had a marked stiffening and glazing effect on cloth immersed in it for as little as 30 seconds and remained slightly tacky until fully dry. In general, these resinous

Figure 5.1. Production of tree sap colourants: a) Nooroa removes the bark from an *Aleurites moluccana* tree. b) The remarkably red shavings of *Casuarina equisetifolia* wood. c) Vavai'iri, the sticky, brownish-red extract of *Aleurites moluccana*. d) Dyed fabric sample of *Aleurites moluccana*. e) Dyed fabric sample of *Casuarina equisetifolia*.

pigments take longer to dry than the water-based ones discussed below. The *Casuarina* dye was also slightly stiffening but very matt. We also produced a traditional Mangaian mixture of the two (Hiroa, 1944: 72), which retains the glazed quality of the tuitui but also lifts the colour significantly towards a rich blood red, while losing the pinkish hue of the toa alone. Undoubtedly repeated immersions or applications after drying, or the production of a more concentrated dye, would have intensified the colours significantly.

In Tahiti, all such sap extracts (whether for pigment or otherwise) were classed as *hiri,* and in Hawai'i as *hili* (Ellis, 1832; Hiroa, 1957: 187); some were boiled with hot stones to improve extraction and the colour itself. Extract wringers (*fautaukoka*, *taka*, etc.) for deriving liquids from such masses of processed vegetable matter were historically manufactured in various ways across Polynesia, but this kind of ephemeral practical tool is rarely found in museum collections; typically, they were woven from *Pandanus* leaf or *Hibiscus tiliaceus* bast strips, although the sieve-like coconut spathe has long been preferred on Mangaia. An important wider point about these resinous sap extracts – and that of the candlenut in particular – is that they provide the base for many other red and black pigments throughout the region, and often had various colouring agents added to them subsequently. On this point, the black pigments are discussed next, and the ochres later, but before leaving the brown sap pigments, it is worth noting that they were traditionally darkened by adding charred *tou* wood (*Cordia aspera*) in Samoa, and more recently by boiling with old nails in Tonga (Kooijman, 1972: 217; Veys, 2017: 42); therefore, both the redness and the darkness of brown pigments have been open to significant manipulation by paint makers for centuries. Several of these sap-derived pigments imparted a degree of water resistance to tapa immersed in, or painted with, them.

The bark or outer wood of three trees of the genus *Syzygium* (formerly *Eugenia*) provided pigment in both Western Polynesia and Hawai'i. The canoe plant *Syzygium*

Figure 5.2. Candlenuts, the fruit of *Aleurites moluccana*. When burnt, soot from these oily kernels is the principal source of almost all Polynesian black pigments.

malaccense (the Otaheite or Malay apple; Plant Profile 16) provided a dye described as red in Samoa and Niue (where the plant is *nonu fi'afi'a* and *kafika* respectively), but brown in Hawai'i (where it is called *ohi'a'ai*). This discrepancy may be explained by the greater availability of more brilliant reds in Hawai'i, which Western Polynesia lacked prior to the importation of *annatto* discussed later. Given the fruit's popularity for food throughout the region, it is a little surprising that the pigment should not be known elsewhere, but it may have been entirely superseded by the *mati* pigments discussed below, then forgotten. Similarly, the bark of two related endemic species of Southern Lau in Fiji, *yasi-ni-wai* (*Syzygium seemannii*) and *yasiyasi* (*Syzygium effusum*) provide one of the red extracts added to *Aleurites* sap in the production of *kesa* pigment (Kooijman, 1972: 358).

Soot-based black pigments

Black was probably the most important of all Polynesian pigments, and it seems clear that a stable, rich true black had been perfected by the time of Polynesia's first settlement. Everywhere across the region, the source of the best black remained the same, and was the same as the black pigment used in Polynesian tattooing: the fine soot or lampblack given off during the burning of candlenuts, the oily kernels of the fruit of the *Aleurites moluccana* (tuitui, tutui, kukui, *lauci, lama, tiara*) (Figure 5.2; Plant Profile 10). Traditionally bored through and strung on the pinnule of a coconut leaflet to form 'candles' for lighting the home, in windless conditions an extremely fine oily soot can be collected from these kernels by inverting a coconut shell over them as they burn. This is then mixed into one of the brown sap pigment bases outlined above to produce a stable, true glossy black. From the great predominance of candlenut sap also being the preferred base, and the tree being a canoe plant brought by the settlers, it seems likely that this practice was brought into Polynesia with the tree as an established bi-production practice of domestic lighting. While the double-source (kernels and sap) *Aleurites* black was found from Fiji to Hawai'i, there were important variations worth discussing here, and other quite different black pigments produced in certain places.[2] While candlenut soot was relied upon in some areas of Fiji, in others *makadre* resin (also used to varnish ceramics) harvested from the *dakua* tree (*Agathis vitiensis*, now known as *A. macrophylla*, the Fiji *kauri*), was burnt and its soot gathered, in an identical manner to the candlenut method (Kooijman, 1972: 355-356). This makadre-based black (termed *loaloa*) is perhaps the deepest and most even found in the region, and its *Aleurites* base makes it notably more matt. In Tonga, Samoa, Futuna and 'Uvea, however, the preferred brown sap of the *Bischofia javanica* was also the principal base for black pigments, producing the glossy black of Tongan *ngatu 'uli* and Samoan *siapo ema*.

Anaerobic earth-based black pigments

Perhaps the simplest and most ancient blackening method for tapa was its immersion in iron tannate/hydrogen sulphide-producing black mud generated by anaerobic bacteria in silted-up lagoons and estuaries, coconut plantations or wet taro paddies (Sumich and Morrissey, 2004: 206). The latter was the commonest method for producing the popular black tapa called *pakoko* on Mangaia (Hiroa, 1944: 72). This same technique was used throughout Polynesia to dye coconut husk fibres black, and was equally carried to Aotearoa New Zealand, where Māori used it to dye the leaf strips and fibres of *harakeke* (*Phormium tenax*) (Smith et al., 2018). While one might superficially expect these anaerobic silt dyes to have had a purely *aesthetic* purpose, this treatment was also widely understood to have both antifungal and insecticidal effects on the material steeped. Indeed, in the context of tapa, this may explain (in part) the origin of black fabric's use for shrouds and mourning dress.

In certain areas, a combined series of the foregoing techniques was deployed to redouble their effects. Thus Hiroa (1944: 72) describes a four-stage method employed on Aitutaki where cloth was immersed first in the vavai'iri liquid from *Aleurites* and dried; then in the toto liquid from *Casuarina* and dried again; then steamed in an earth oven lined with banana stem slivers and *Aleurites* leaves (although it is presently unclear what this phase did to the cloth); and finally it was soaked in a taro paddy until it reached the desired shade of black. An analogous complex multi-phase black dyeing process was also documented by Hiroa (1957: 189) for the production of *kaha* fabric in Hawai'i. Unbeaten bast strips were first soaked in *Aleurites* pigment (hili kukui), then beaten and fused into a fabric before a second immersion in kukui dye; then the cloth was immersed in the taro patch for several days, before it was transferred to a calabash stuffed with the ferns of the *pala'a* (*Davallia tenuifolia*, now known as *Odontosoria chinensis* subsp. *tenuifolia*) a red dye in its own right) to stand for several more days. Thereafter it was removed and rinsed thoroughly to clean off the mud and grit, scraped down with a bivalve shell (leaving distinctive wavy-edged broad parallel grooves on the fabric), soaked a final time and finished carefully with the beater. These two separate occurrences of an evidently related process should alert us to the probability that this was a more widespread dyeing complex

2 Kooijman (1972) reports that *Aleurites* also produced a third pigment of a coppery colour in Hawai'i, from its pounded roots and chewed raw kernels.

of Eastern Polynesia, dating back a thousand years or more in some form. Equally, Hiroa's comment (ibid.) that two other Hawaiian fabric types – *hulili* and *pele* – were produced by closely related methods, shows that this had become a generalised system of dyeing practice in Hawai'i, rather than a unique method.

Rhizome and root extracts for yellow and other colours

Another major technological pigment group of Polynesia is that based on grating or pulverising, and then straining or wringing out, rhizomes and roots. There is some basic mechanical affinity with the extraction of saps described above, but these rhizome and root infusions had water added to the comparatively dry pulverised matter (or were watery enough in themselves) to produce a cold infusion that was then strained, wrung out or drained to a useful consistency. In truth, there are much closer analogies with the processes and tools for preparing the definitive Oceanic beverage *kava* (*Piper methysticum*); it also served as a pigment and is discussed below. Such water-based pigments were generally used as immersion dyes, and only occasionally painted on with brushes, or applied with stamps. The two principal Polynesian yellows were produced by this method: turmeric (*enga*, *lega*, *ango*, *cago*, *renga*, *rea*, *ena*, *olena*, *Curcuma longa*) and *Morinda citrifolia* (*nonu*, *nono*, *noni*). Turmeric was the most widely used of all Polynesian tapa pigments, and can be found in the historical literature, and on tapa in museum collections, from every part of the region except Tonga and Aotearoa New Zealand (Plant Profile 11).[3] In essence, the basic process of extraction is simple: we dug up about a handful of garden turmeric rhizomes, approximately 1-2cm in diameter, which we washed and dried (Figure 5.3a). Polynesian turmeric varieties seem considerably more orange than the yellower South Asian turmeric sold on the global spice market. Once grated, no water was added as the fresh rhizome is wet enough. Wringing it out through muslin produced around 200ml of a rich, opaque orange-yellow dyeing liquid (Figure 5.3b). When white cloth was immersed in the liquid, the colour taken was very consistent with it.

Historically, the processing of turmeric was more refined and varied subtly from place to place. In general, the rhizomes were peeled, grated, soaked in water, and the solid fibrous component either strained or picked out. Once this was done, the bright orange-yellow suspension was left for several days to settle out, and the clear water poured off. The residue was dried completely to a fine-grained cake which was ground into a dry powder (Hiroa, 1944: 71-72). An important variation on this basic method was found in Samoa, Futuna, Rotuma and the Marquesas Islands, where the turmeric suspension was poured into a coconut shell and then boiled or roasted in the embers of a fire to reduce it down to a dry powder. Handy's (1923: 292) data from the Marquesas shows that this roasting could darken the pigment towards a deeper orange (*eka moa*), and the distinctive fabric dyed with it was an exclusive prerogative of both male members of the *ka'ioi* society and female chiefs (Kooijman, 1972: 182-183). Similarly, in Futuna, where turmeric pigment production had itself attained the status of a professional craft specialisation, two distinct yellows were

3 The absence of turmeric-painted tapa from the historical Tongan corpus is more apparent than actual: the *vaka 'otua* (deity manifestation vehicles) of pre-Christian Tonga were primarily *kato'alu* baskets containing reliquary bundles of woven fibre garments, whale's teeth and so on, wrapped into a bundle of turmeric-coated tapa (Gifford, 1929). We have no idea whether this *ngatu 'enge'enga* was *kupesi*-rubbed or simply painted, but doubtless every scrap of it was destroyed by the late 1840s or shortly thereafter; logically, it would have been tapu beyond comparison even with ngatu 'uli.

derived at the sifting stage: the finer particles were separated to generate a brilliant orange pigment (*ama*) reserved entirely for body paint, while the coarser particles provided a duller orange pigment (*taua*) for dyeing cloth (Burrows, 1936: 189-199; see Guiot, Chapter 12).

These points above reflect a key point about turmeric pigment which has regional relevance: everywhere in tropical Polynesia, and the Polynesian Outlier societies further west, it was first and foremost a body paint rather than a fabric dye, and a ritually important, supernaturally efficacious substance. Indeed, its near-universal use as a fabric pigment can only be understood culturally in light of that fact – and this is almost certainly the principal reason why yellow is so prominent in historical Polynesian art as a whole: the name of the plant and the colour classification are basically indistinguishable in Polynesian languages. In preparing it for application, the dry renga was made up with coconut oil; on Mangaia (and perhaps elsewhere) a coconut cream base provided a paler, more matt pigment which defined the *pa'oa-tea* fabric type. For both turmeric and the other rhizomes and roots discussed here, Hiroa (1944: 72) also mentions Cook Islands Māori women adding a little seawater – seemingly concrete evidence that Polynesian dyers were just as aware of the efficacy of salt fixatives on vegetable fibres as their European contemporaries (Fairlie, 1965: 492-493). Cultural historians are still reconstructing the ritual function of turmeric in the pre-Christian cosmologies of Polynesia, but the consensus seems to be that it possessed the capacity to render people and things *tapu* (supernaturally demarcated, sacred to the gods) and enlivened. While turmeric dye self-evidently imparted profound aesthetic qualities to cloth, therefore, we simply cannot disentangle those aesthetic qualities from its sanctity and symbolic value – they were one and the same.

Although less culturally significant than turmeric, *Morinda citrifolia* (nonu, nono, noni) was a key secondary yellow pigment of Polynesia, used in Samoa, 'Uvea, the Society Islands, Austral Islands, Cook Islands and Hawai'i (Kooijman, 1972; Plant Profile 12). In general, the extraction process is fairly well understood and was undertaken on Mangaia in 2017. We uprooted a self-seeded nono sapling which was growing in an inconvenient location, digging carefully to preserve the brittle side roots as well as the tap root. From a tree 2.5m tall, we lifted a tap root 7-8cm in diameter at ground level and 50cm long (Figure 5.3c). We washed it and left to dry overnight, then the next morning we peeled off the root's thin, copper-coloured bark. Nono has a bright orange, moist and pulpy root cortex approximately 5-10mm thick, surrounding its woodier yellow root stele (Figure 5.3d). Shaving with the bush knife once again produced about 500g of orange root cortex pulp, which needed no additional water before wringing out, and gave a surprisingly bright, clear yellow watery liquid. When white cloth was immersed in this liquid, it dyed a bright and clear shining yellow (Figure 5.3e). In those cloths from parts of the Cook Islands (*e.g.* Aitutaki) and elsewhere upon which both orange and yellow pigments are found in combination, it is consequently useful to know that *Morinda* (on its own) can only provide a true cool yellow colour – *i.e.* similar to ripe bananas or lemons – while turmeric always has some warm orange tone to it. In the Society Islands, Austral Islands, Hawai'i and possibly elsewhere, this bright yellow colourant was chemically transformed into a blood red one through its halochromic sensitivity to alkaline ground coral (Flowers, Smith and

Figure 5.3. Production of yellow colourants in Polynesia: a) Selected and washed rhizomes of Polynesian turmeric, *Curcuma longa*. b) Grated and wrung out, turmeric extract is of a markedly orange-yellow hue. c) Nooroa demonstrates the bright yellow root cortex underlying the root bark of nono, *Morinda citrifolia*. d) Its bark removed, the stark difference between the soft, moist outer nono root cortex and the woody, dry root stele can clearly be seen. e) Dyed fabric sample of *Morinda citrifolia*.

Brunton, 2019).[4] Contrary to some sources, no pigment (yellow or red) can be derived from the aerial bark or bast of *Morinda citrifolia*. The outer bark of both roots and aerial stems is thin, dry and papery, while the aerial bast is thin and mucilaginous, a chlorophyll-tinged mustard colour, and bleeds out only small quantities of a thin, watery and colourless sap. We infer that Aitken's (1930: 82-83) hypothesis, that the source of red nono pigment could be found in another part of the same plant, was merely a hypothesis and nothing more, made in lieu of an awareness of its pH sensitivity.

Kooijman (1972) catalogued four other dyes produced in substantially the same manner across the region. The rhizomes of the fish poison *kavapiu* provided a paler yellow dye than nono in the Cook Islands. Some Tahitian women used the true kava root (*ava*, *Piper methysticum*) to dye tapa its distinctive beige-grey colour. In Rotuma, the root cortex of the *pakou* (a sedge, *Kyllinga nemoralis*, now known as *Cyperus mindorensis*) provided a brownish-purple pigment that was mixed with turmeric as a substitute for the sap-based browns enumerated above. In Fiji, the root cortex of *gadoa* (*Elaeocarpus storckii*) produced a brownish-red that was boiled with soot and red ochre to give a dark brown.

4 According to Buck (1930), two varieties of *Morinda citrifolia* were recognised in Samoa; the *nonu vao* (bush *nonu*) and the *nonu 'ulu* (clump *nonu*); they had been abandoned for pigment production by the time of his ethnographic work in the early 20th century, and therefore, whether there was any difference in their tone is now unclear. Martin (1817) similarly discussed its use in Tonga for dyeing weaving materials but makes no reference to its application to tapa.

The mati dye complex

The family of bright red dyes called mati (after the fruit of the *Ficus tinctoria*, their one common ingredient) were produced, to one recipe or another, in the Society Islands, Austral Islands, Cook Islands and Hawai‘i. Placed within the context of the now well-established chronology of Polynesia's human discovery and settlement, this distribution allows us to infer with some reliability that the discovery of its production process probably occurred in the Society Islands during its earliest prehistoric phase of human occupation (ca. 600-1100 AD). In mati production, a chemical reaction occurs between the latex of the *Ficus tinctoria* fruit and the crushed leaves of the partner plant – most often those of the tou or *kou* tree (*Cordia subcordata*) in the process first described in 1769 (Parkinson, 1773; Banks, 1962). In total, five different species were harvested to provide leaves for the mati dye process. As well as tou leaves recorded across the full range of mati's production, in both the Society Islands and Cook Islands mati latex was also reacted with the leaves of the *bua* or *morirei* (*Solanum repandum*, the native Polynesian tomato), and in the Societies alone, also the *taheino* (*Messerschmidia argentea*, now known as *Heliotropium arboreum*) and the *pohua* (*Ipomoea pes-caprae*). This range of plant constituents shows that mati was not a single red pigment, but rather a technological complex of closely related pigments produced by a single methodology. We do not presently know what variation in pigment properties resulted from the use of these different leaf species.

As HMS *Endeavour* was sailing back to Europe, Banks (1962) wrote with dismay that some of the mati-dyed cloths he had purchased and been gifted in the Society Islands were already fading heavily within a matter of months.[5] The resultant pale candy pink colour, which is still a very beautiful hue, is believed to be present on some early Society Islands cloths in museum collections, including the Tahitian *ahu* samples used by Alexander Shaw (1787) in his albums of barkcloth from the Cook voyages. The ephemerality of some mati is of considerable interest to us now, as many historic tapa are as richly coloured today as they were some 250 years ago. The most logical hypothesis to explain this variable fading of mati is that different leaf species produced different degrees of permanence in the pigment, though this has not been tested. The concurrent production of mati in both the Society Islands and Cook Islands using more than one leaf species suggests that different pigment properties resulted from each. Subtle variations in the pigment colour are the most likely motivation for the use of such a large range of plants, although those colour variations are presently unknown. Equally fastness of the colour, and local availability of the relevant leaves, may have been important factors.

5 When Sydney Parkinson and Sir Joseph Banks first documented mati production and use on Tahiti in 1769, both were entranced by its brilliant scarlet colour, which Banks observed was a truer, richer red than any pigment available in contemporary Europe. Banks was particularly fascinated by mati's production process as evidence of a complex chemical industry and scientific experimentation in 18th-century Polynesia, although it is unlikely that he grasped the long centuries of Austronesians developing a profound traditional ecological knowledge of Malesia, upon which the pigment's discovery was built. However, the significance of the pigment for Banks' philosophical musings on the technological capacities of the Polynesians centred on the fact that neither of mati's components is itself red prior to processing, and therefore its discovery evidences a history of strategic experimentation; Banks' intention was substantially to prove that precisely those same faculties of rational scientific enquiry that were industrialising Europe at the time, were equally evident in the geographically and culturally distant South Sea Islands.

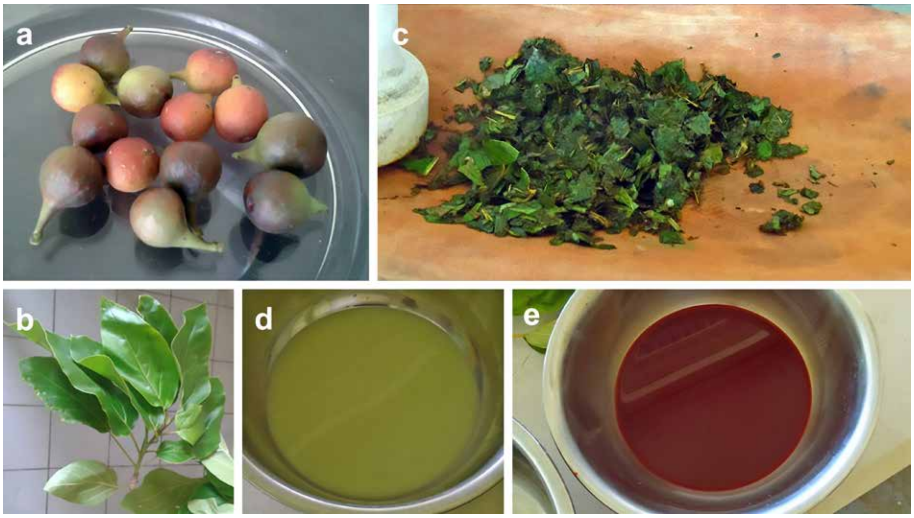


Figure 5.4. Components and stages of mati dye production: a) The figs of the mati tree, *Ficus tinctoria*. b) The leaves of the tou tree, *Cordia subcordata*. c) Shredded and pounded, the tou leaves begin to oxidise, darken and redden. d) Vai mati (mati water), the latex-rich, sticky product of immersing the figs. e) Mati dye itself, following ten minutes' immersion of the pounded tou leaves.

We produced mati on Mangaia in November 2017. Even on Rarotonga, *Ficus tinctoria* is now extremely rare. A large mati tree grows in the grounds of the government buildings in Oneroa, however, and was in heavy fruit, so we picked around 200 (Figure 5.4a). The stalk ends were pinched off the figs, which exude a yellow-white milky latex. The figs were dropped into a bowl of fresh water, and after processing around a hundred fruit like this, the water became cloudy and grey, and then an opaque yellowish-white, in 10-15 minutes. This is the *vai mati* (mati water) described in historical accounts (Figure 5.4d). We collected tou (*Cordia subcordata*; Plant Profile 14) leaves near Oneroa harbour (Figure 5.4b). They were prepared by tearing them into 1-2cm shreds, then pounding them for 5-10 minutes – during which time the bruised shreds became dark green and began to take on a dark reddish tinge at the edges and in the veins, seemingly by oxidation alone, or the mixing of previously separate chemicals within the tou leaves themselves (Figure 5.4c). When we wrapped the pounded tou in a muslin bag and immersed it in the vai mati, filaments of brownish-red pigment immediately began to diffuse into the water, which darkened. After five minutes, the liquid was a strong, solid and fairly dark scarlet, and a dipped fabric sample took on a bright and extremely beautiful clear orange-pink tone. After five more minutes of immersing the tou, the vai mati had become a dark blood red (Figure 5.4e). Subsequent discussions among ourselves highlighted the number of potential varying factors in this complex process: notably, the number and ripeness of the mati fruit (green figs seem to produce more latex); the number and size of the tou leaves (young leaves are more succulent); the vai mati infusion time; and the tou immersion time. Clearly, much further work, and further analysis of the cloths, remains for the lost details of this iconic Polynesian pigment's production to be rediscovered.

Other colourants from aerial plant parts

Given the complexity of the pigment groups discussed above, it should come as no surprise to the reader that a range of other Polynesian colours were derived from the fruit, flowers, leaves and other succulent parts of various plants. Three notable fruits were used in Polynesia for pigment production. The *hea* (*Parinari insularum*) is a tree endemic to Fiji that was carried to Tonga and ʻUvea in ancient times, seemingly for different reasons: in Tonga, its ripe red drupe provided a brilliant red glaze that was very popular around 1800 (Martin, 1817). In ʻUvea, however, the unripe fruit was pressed for its oily juice which provided a perfumed base for both turmeric and *Morinda* yellows (Burrows, 1938: 132). In the Society Islands and the Cook Islands, *tamanu* (*Calophyllum inophyllum*) nuts were cracked for the veins of rich sulphur-yellow pigment running through their cream-coloured kernels. On Mangaia in 2017, we extracted a pale yellow dye from tamanu nuts in this way; grating them finely to a pulp, adding a little water and wringing them out to produce an opaque, oily yellowish cream-coloured dye. A cloth immersed in it took on a pleasant, delicate primrose-yellow colour. In the Society Islands, the edible purple fruit pulp of the *motuʻu* tree (*Melastoma affine*, now known as *M. malabathricum* subsp. *malabathricum*) also provided a bluish-purple pigment; although no details of its historical processing are recorded, the tree's common name in English is 'blue-tongue', so it was no doubt merely the juice.

The stems of two banana varieties were tapped for their colourful sap: in Samoa, the *soaʻa* (the mountain plantain, a *Musa* hybrid of unclear ancestry) produces a dark violet pigment at the base of its pseudostem (Buck, 1930: 302-304). In the Society and Cook Islands, the *feʻi* banana (*Musa troglodytarum,* a short-fruited and thickly seeded species) similarly provided a pigment described by Wilson (1799: 190) as black; this was harvested from a banana side-sprout on Rarotonga in November 2017 and is also an extremely deep inky violet. Another stem part furnishing a yellow pigment in the Society Islands was the leaf petioles of the popular carving tree *miro* (*Thespesia populnea,* the Pacific rosewood).

Beyond the mati complex outlined above, very few leaves are listed as providing pigments in Polynesia. On Mangaia, the *ʻange* (*Geniostoma sykesii*) is one exception; its pounded leaves were infused into coconut cream to provide a perfumed oily grey pigment (Whistler, 1990). There are similarly few flowers described as providing dyes, but the foremost is undoubtedly *Hibiscus rosa-sinensis* (*kaute*). On Mangaia in 2017, we struggled to find the Polynesian-introduced *Hibiscus* (one of the few ornamental canoe plants) although numerous imported ornamental hibiscus varieties from Asia are growing all over the island. We eventually found a pair by the roadside and harvested about a dozen flowers. Although light scarlet when they open, the flowers become purplish as they fade, and we found that pounding them whole (as the sources describe) produces the same darkening colour change. Wringing this mass out produces a mucilaginous and unpromising goo which, when we immersed cloth in it, took a long time to dry, but gave a useful violet-blue colour, though with a patchy stained appearance. Tuara remembers Mangaian children staining their lips and cheeks with the prominent colourful anthers of the hibiscus flower in play a few generations ago, and we hypothesised that these parts may not contain the disruptive mucilaginous components of the petals. We collected anthers from more flowers, pounded and pressed these in a little water to obtain a clear, bright amethyst-purple dye which coloured cloth a light lilac. Given the foregoing points, it seems unlikely that Hiroa's (1944: 72) description of *Hibiscus* flowers being pounded then rubbed onto tapa to create splashes of red is accurate; the result must have been a purple of some kind. He mentions that this dyeing process was performed at sunset, and the tapa dried overnight, to prevent fading, so we might expect that this was a particularly ephemeral pigment and may be little in evidence on historical cloths today.

Ochres and European-introduced pigment plants

As well as being locally available on ʻUvea and Futuna, the sources of good red ochre within Western Polynesia are enumerated clearly by Kooijman (1972), and are still well known today: in Fiji, Komo island in Lau, Bau island, and the northern coast of Macuata; ʻEua island in southern Tonga and inland from Neiafu on Vavaʻu in the north; upland areas of ʻUpolu and Tutuila in Samoa. Ochre use (which was surely there anciently) seems to have disappeared throughout the Society Islands, Cook Islands, Austral Islands and Marquesas Islands by the late 18th century. This suggests that it was entirely superseded by the discovery of the scarlet-producing mati, and lime-reddened *Morinda*, discussed above. The use of both red and yellow ochres in Hawaiʻi, and red and black ochres on Rapa Nui, is equally well documented; no doubt motivated by the seemingly ceaseless pursuit of manifold colours in the former case, and by lower biodiversity in the latter. Everywhere it was used, ochre was ground and suspended in oil to make a stable pigment. Often the evidence of this oil base can be seen on the reverse of Hawaiian kapa where it has soaked through and darkened the cloth.

There is one good reason to discuss the use of ochreous pigments (*ʻumea*, *ʻele*) and introduced European plant pigments in the same place: throughout Western Polynesia, the former were heavily replaced by the use of *Bixa orellana* (*loa*, kesa, annatto) in the late 19th century. *Bixa* was, in truth, the only European-introduced pigment plant to arouse any local interest in Polynesia; Kooijman (1972) describes its use in Fiji, Samoa, Futuna, ʻUvea and Hawaiʻi. He also mentions juice of the imported domesticated orange (*Citrus aurantifolia*) being used in the Cooks to provide a pale orange dye; differentiating this from the more orange-hued end of mati's range on the one hand, and from turmeric on the other, is a piece of work remaining for scholars of Cook Islands art to undertake. In reality, perhaps the most notable feature of the Polynesian tapa makers' response to European-imported dyes is a general disinterest: indigo arrived early with European settlers, as did the 'washing blue' that became so important to Melanesian art, but there seems to have been minimal interest in dyeing or painting tapa blue anywhere in Polynesia outside of Hawaiʻi, and American Samoa during the 20th century. Indigo plants could easily have been imported from eastern Melanesia at many points in the preceding centuries, but it seems that there simply was no interest. Equally, synthetic dyes have been available in the region for more than a century, and while they have gained some popularity in matting, basketry, and (of course) dress-making with woven fabrics, it is clear that a conservative aesthetic filter surrounds colour in Polynesian tapa decoration.

Discussion

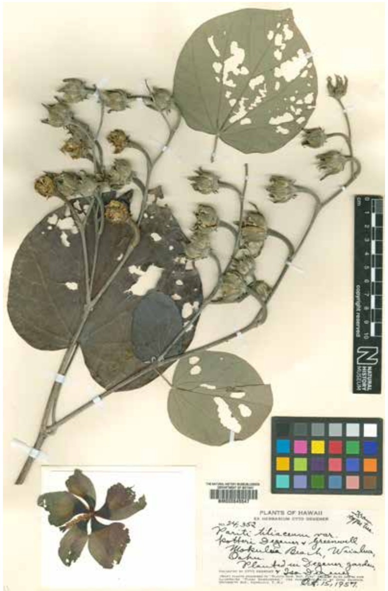
This has been a relatively brief regional overview of Polynesian pigments outside of Hawaiʻi. We have attempted to provide both a summary of the historical data and useful findings from our experimental reconstructions of dye production on Mangaia. The fabric dyes and pigments of Polynesia have been presented here as a set of seven related groups, based on the plant parts exploited and the technology of their extraction: the sap-based pigments of resinous browns and reds; the soot-based black pigments suspended in them; the anaerobic silt blacks; the rhizome and root infusions producing the principal yellows; the brilliant reds based on the mati reaction; a mixed group of simple plant extracts; and a cluster of ochreous oil-based paints that were heavily eroded by annatto in the late 19th century.

Our experimental reconstruction of traditional dye extraction processes on Mangaia has helped to resolve some key uncertainties about the source plant parts, and finer details about the extraction methods and visual traits of certain pigments, allowing us to better differentiate the sap-based pigments and the yellows than before. Equally, a lot of rigorous ethnobotanical work has been undertaken in recent years – certainly since Kooijman wrote *Tapa in Polynesia* in 1972 – and we may clarify the botanical identities of certain historically documented pigment plants. That this new data of secondary synthesis can still be produced so easily shows how much more remains to be rediscovered by contemporary makers in the Pacific, and researchers around the world.

~ Plant Profile 5: Fibre ~

Beach hibiscus, Sea hibiscus *Hibiscus tiliaceus* L. (also known as *Talipariti tiliaceum* (L.) Fryxell) MALVACEAE

Mark Nesbitt



Left: Leaves at Haiku, Maui, Hawai'i.
Right: Otto Degener 24352, Waialua, Oahu, Hawai'i, 1957 (Natural History Museum London, BM000645547).

Beach hibiscus is a medium-sized tree, 3-10 metres in height and forming a tangled thicket. It is native to coastal areas throughout the tropics and on most high islands of Polynesia, though its native status in Hawai'i and other islands in eastern Polynesia is uncertain. It is easily cultivated from seed or cuttings, and has also become naturalised, with potential to be invasive. It is an important source of a soft timber, and is also used as living fencing and in medicine. It remains one of the most important fibre sources in the Pacific. The inner bark can be used without further processing, split into strands to be woven into kava strainers, netting and other basketry. After retting in seawater, the bark takes on a lacy appearance and is used in clothing such as 'grass' skirts. Hibiscus is not a well known tapa species, but some early travellers recorded its use for barkcloth in Niue, the Cook Islands, the Austral Islands and Hawai'i, and fibre analysis has confirmed this in one case (Chapter 1; Tamburini et al., 2019).

Vernacular names (selected): Tonga, Samoa, 'Uvea, Futuna: *fau*; Cook Islands: *'au*; Society Islands: *purau, fau*; Hawai'i: *hau*; Fiji: *vau*.

~ Plant Profile 6: Fibre ~

‘Ākia *Wikstroemia uva-ursi* A. Gray THYMELAEACEAE

Mark Nesbitt

Left: Plant at Waimea Arboretum and Botanical Garden , Oahu, Hawai‘i.
Right: U.S. South Pacific Exploring Expedition under the command of Capt. Wilkes, XI/66 (Kew, K000900252).

‘Ā*kia* is a wild plant native to four of the Hawaiian islands. It is a sprawling shrub, up to 1.5 metres high, and is relatively uncommon in coastal and dry forest habitats, although now increasingly used for landscaping. The inner bark of several Hawaiian species were used for cordage, and there is a single historic reference to its use in kapa (Fornander, 1919: 636). Lisa Schattenburg-Raymond (Chapter 4) considers it may have been used as a component of double-retted fibre, *pōpō*, in Hawai‘i. Other species occurring in Hawai‘i and other Polynesian islands have also have been used for cordage.

6

Hawaiian Dyes and Kapa Pigments: A Modern Perspective and Brief Analysis of the Historic Record

Lisa Schattenburg-Raymond

The colour palette of *kapa* (Hawaiian tapa) created at the time of Captain Cook's visits in 1778 and 1779, as seen in the pieces collected or observed by both him and his crew, included white, brown, black, yellow, red, and blue. These are the only kapa pieces one can observe that are certainly without Western influence, and they provide a glimpse of the Hawaiian aesthetic before contact. It must be acknowledged that definitive conclusions about the variety of all dye colours achieved by Hawaiians at the time of Cook's visits cannot be made, as neither what was collected, nor what was observed was representative of all the kapa being made in Hawai'i at the time. It is possible that Hawaiians in various geographical areas other than those Cook visited may have had particular styles, patterns, or colours associated with them.

Like other kapa making practitioners, I am fascinated with these early pieces. However, my own interest in dyes began years before I became a kapa maker. My mother was an ethnobotanist and fibre artist; while she was in college at the University of Hawai'i she studied with the renowned ethnobotanist Beatrice Krauss. Using both native and non-native plants, she conducted extensive research into natural dyes, and interesting dye concoctions were often present in our home. Though my mother was unsuccessful, she endeavoured to create the red and blue colours known to have been used in Hawaiian kapa. I have been more fortunate with producing those colours in recent years. As a horticulturalist and former Director of the Maui Nui Botanical Gardens, I had access to many Hawaiian plants with which to experiment. I focused my research specifically on Hawaiian plants and other dye sources that would have been available in the 19th century to create the colours found on early Hawaiian pieces. Over the last 20 years, I have made several exciting discoveries which have allowed me to produce several blues, reds, and even the ever-elusive green; in fact, all the colours of the rainbow (Figures 6.1 and 6.2).

Scholarly research has played an important role in making these discoveries, and as a researcher, I have primarily relied on the works of Samuel Manaiakalani Kamakau, William T. Brigham, Te Rangi Hiroa (Peter Buck) (1957) and Simon Kooijman (1972).

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Figure 6.1. Dye samples from one of my workshops.

Figure 6.2. A sampler of Hawaiian dyes.

They are the main sources regarding Hawaiian kapa making and dyeing. Kamakau, writing in the late 19th century used native informants; his work was originally published in Hawaiian and only translated into English in the 1970s (Kamakau, Pukui and Berrère, 1976). Brigham (1911) wrote the influential work *Ka Hana Kapa* in the early 20th century and undertook some of his own experimentation with dyes, but felt that his results were inconclusive. Hiroa (1957) and Kooijman (1972), writing later in the 20th century, also shared their insights; however neither of them ever made kapa in the Hawaiian tradition because there was no one living to show them. Brigham, Hiroa, and Kooijman all defer to Kamakau as the primary historical source, but sometimes make unsubstantiated observations without practical merit. I offer here some insights and clarification regarding the work of Kamakau, the first source, as his account offers the most accurate information when trying to produce colours.

It is important to realise that kapa making of the later 19th century, when Kamakau recorded it, was different to that of the 1770s in several important ways, and most of them relate to its decoration. In fact, traditions of kapa dyeing and decoration changed quickly after first contact with Europeans. Trade cloth of highly coloured and calico-patterned western fabrics appeared in Hawai‘i from the time of Cook's visits onward, and rapidly influenced subsequent kapa colours and designs. Prior to the abolition of the *kapu* (Hawaiian religious system) colours such as red and yellow which were associated with the chiefs and their gods, may not have been suitable for commoners. The colour palette had blossomed by the early 1800s, and Hawai‘i's diverse endemic flora provided a rich source of materials that Hawaiians could draw upon to create their colours. It is clear that kapa makers quickly began experimenting to replicate introduced fabric designs. An early visitor described the beauty and variety of the kapa:

Figure 6.3. A sampler of various ʻohe kāpala and lapa designs with an ʻōlulo (bamboo container).

> The tapa is naturally of a light colour, and capable of being bleached till perfectly white. Much of it is worn in this state; but the greater portion is stained with a variety of dies, [sic] extracted with much skill from different indigenous plants. The colours are often very beautiful, principally green of every shade, from the lightest to the darkest; yellow, from a dark salmon to straw colour; red, from a rich crimson to a delicate blossom, purple from a dark plum through all the hues of lilac to a light dove; brown from chocolate to fawn; and black and white. The cloth is dyed with one of these plain though out, and worn thus, or again stamped with several others, in an endless variety and combination of figures. These they devise with much ingenuity and taste, or imitate skillfully from those imported articles (Stewart and Ellis, 1828: 48).

We can see that the colour palette, even by the early 1800s, was much broader than the pieces collected by Cook's crew. The tools used to decorate kapa also changed after contact. Originally, bamboo liners or *lapa* were used. Lapa could be as simple as a pen or have multiple tines. The lapa were dipped in ink and then drawn along the edge of a bamboo ruler to make straight lines. With these simple forked instruments many complex patterns were made. After contact we begin to see designs from carved patterned bamboo stamps called *ʻohe kāpala* (Figure 6.3). These reflect geometric motifs, calico print patterns, and traditional Polynesian motifs.

Wearing highly decorated kapa would have been the prerogative of the *aliʻi* (chiefs). Pukui, Haertig and Lee write: 'The *malo* or *pāʻū* might be stiff or soft, plain or patterned, coloured or left its natural beige-like hue, or bleached white. Personal preference, rank, and the era in which one lived all determined the choice. Until the time of Kamehameha when ships brought in imported cloth, the garments were always made of *tapa.* Even these laboriously pounded *tapa* were dyed and decorated.' (Pukui, Haertig and Lee, 1972: 292).

Figure 6.4. Moʻomoʻo dyed with hili kukui (brown) and then placed in the taro patch mud (black).

Principal Hawaiian dye sources

Here, I provide a brief overview of the most important traditional dyes of Hawaiʻi. *Hili kukui* (*Aleurites moluccana*, candlenut) was considered one of the best, and most widely-used, dyes. The kukui dye differs from other types of hili (bark) dye by having a varnish-like quality that coats, strengthens and preserves the bast fibres. Hili is the juice expressed from the inner bark of various trees; the hili of many different species were used, providing various shades of brown. They are sometimes referred to as 'red' as defined by the Hawaiian eye. Some of these include, *hili koa* or *ʻakoa* (*Acacia* sp.*), hili ʻahi* or *ʻiliahi* (*Santalum* sp.), *hili kōlea* (*Myrsine* sp.) and *hili ʻōhiʻa* (*Metrosideros polymorpha* Gaudich). Brown or *makuʻe* is made by mixing ʻiliahi fruit and brown *palaʻā* (*Sphenomeris chinensis* (L.) J. Sm.) together. The palaʻā fern makes a rich chocolate-brown dye. Other plants that produce browns are the leaves of the *kou* tree (*Cordia subcordata*) *and māmaki* (*Pipturus albidus*).

Hili were also used in combination with taro *(Colocasia esculenta*) patch mud (Figure 6.4). The tannins in the hili dye chemically react with the iron in the soil to create *ʻeleʻele* or black. Kapa dyed with this product can be brittle and stiff, as the iron will weaken the bast fibres over time. Other black or greyish kapa were *ʻeleuli, ʻāhiahia* and p*uahia.* These kapa types were made by incorporating charcoal pigment from burnt *kō* leaves (*Saccharum officinarum*, sugarcane) or *pili* grass (*Heteropogon contortus*) into the kapa.

Pūnoni and *puakai* are red kapa made with the expressed juice of *noni* root (*Morinda citrifolia*) and lime. *Pū* is a contraction of *puna,* burnt coral lime, and *kai* means seawater. The fruit of the native raspberry ʻākala (*Rubus hawaiensis)* makes a vivid fuchsia colour which is beautiful but notorious for being fugitive. The *ʻōhelo berry (Vaccinium calycinum)* and the skin of the mountain apple *(Syzygium malaccense)* provide shades of light red. *Paʻiʻula* was a popular red kapa after contact. In the early 1800s, and possibly even as early

Figure 6.5. a) Ma‘o flowers used to make a green dye. b) Yellow ‘ōlena and green ma‘o dyes.

as the late 1700s, Turkey red cotton or other red fabric, a popular trade commodity, was ground in a stone mortar until it was powdered. It could then be applied to the wet surface of the kapa and beaten in. Other reds came from red/orange ochre pigments or oxide clays called *ʻalaea*. These pigments can be ground to powder, wrapped in a small piece of kapa or cloth and rubbed onto the surface of the piece one wants to decorate. They can also be mixed with binders and used as inks for lining or stamping.

Hōlei is a yellow dye from the root and bark of the hōlei (*Ochrosia compta*). The white latex sap is also a fixative. P*uaniu (*coconut flower*)* kapa is dyed with coconut oil; the name refers to its ivory colour. *Halakea* is the name of a light yellow dyed from coconut oil possibly steeped with the fragrant seeds of the *hala* tree *(Pandanus tectorius)* (cf Ellis, 1917 [1827]: 83). From the mature fruit of the *nāʻū* (*Gardenia brighamii*) comes a vivid golden yellow dye. The introduced, and now more common, Tahitian gardenia is a good substitute as the native nāʻū is an endangered species. Other yellows are derived from the oily seeds of the *kamani* tree (*Calophyllum inophyllum*) and the bright yellow sap found in the mature green seed pods of the *milo* tree (*Thespesia populnea*). ʻŌ*lena* (*Curcuma longa,* turmeric) is commonly used as a dye here in Hawaiʻi and throughout the Pacific (Figure 6.5).

Puakoali translates to 'morning glory flower' although the dye comes from purple fruit pulp of the seeds of the *ʻiliahi* or sandalwood (*Santalum* sp.*)*, not the morning glory itself. In the Hawaiian culture kapa dye colours are sometimes named after the thing in nature that they closely resemble. I have achieved other variations of purple from the following plants: *kūkaenēnē* (*Coprosma ernodeoides*)*, hāhā* (*Delissea rhytidosperma*)*, hame* (*Antidesma pulvinatum*)*, pōpolo* (*Solanum americanum*) and *kanawao* (*Broussaisia arguta*).

An important point needing to be addressed here concerns *kaʻina*, another purple dye. The name literally translates as 'sea urchin', and ʻina are a popular delicacy which secrete a purple coloured fluid when they are opened. However, that this is the actual source of a purple dye is a misunderstanding I repeatedly see mentioned (and enshrined in Hiroa, 1957). Other writers call it *hāʻukeʻuke* (Finkey, 1998). Although we do not presently know from which of the aforementioned plants this purple dye came, I can say with certainty that this was not historically used as a dye for kapa. I have tried it, as have a number of my kapa making colleagues. The result is very similar to putting fermented fish sauce onto your kapa and the residual odour is extremely off-putting. My feeling is that there was a mistake in the historical record, and someone confused hāʻukeʻuke, a popular stamp design motif of the mid-19th century resembling a sea urchin, with using the actual creature as a dye.

A true green dye is extremely rare to find in nature, and most cultures have to combine yellow and blue dyes to achieve it. However, the dried flowers of the Hawaiian cotton, *maʻo* (*Gossypium tomentosum*, now known as *G. hirsutum*) will provide different shades of green with the addition of wood ash or egg white (Figure 6.5). Unfortunately, in *Ka Hana Kapa*, Brigham (1911) mistook the *Abutilon menziesii* for *Gossypium tomentosum* – both plants are called maʻo. He incorrectly concluded that you could only obtain a green by pulverising the leaves of the *Abutilon* and this error is still often reprinted in modern works.

It is interesting to note that there is no Hawaiian word for blue, and several other cultures have this same phenomenon (Macdonald, 2018)**.** It is not the case that people could not see the range of the spectrum we call the colour blue; rather that they did not perceive it as a separate colour with its own name. Today we use *polū*, the transliteration of blue. Kamakau used *uliuli* which has multiple meanings; it describes blue, green, black or any dark colour. The bright blue berries of *ʻukiʻuki* (*Dianella* sp.) provided us with our

Figure 6.6. a) ʻUkiʻuki fruit for blue dye. b) Blue dye made from maʻo hau hele flowers.

best blue (Figure 6.6a). Although not documented in historic records, I can get a range of blues from the flowers of m*aʻo hau hele* (*Hibiscus brackenridgei*) (Figure 6.6b) and *hau* (*Hibiscus tiliaceus*) with the addition of wood ash.

Hawaiians were known for their quick adaptation of new technologies and customs. As outside contact increased, trade items were incorporated into kapa making in Hawaiʻi. Western dyes such as indigo and later other synthetic dyes such as blue ultramarine or laundry bluing were incorporated. As mentioned above, Turkey red and Nankeen blue fabric were ground in a stone mortar and added to the kapa. The seeds of *lāʻau ʻalaea* (*Bixa orellana)* also known as achiote, annatto or lipstick plant were used to make a bright orange colour. The inclusion of some of these foreign materials can help to identify the age of some kapa.

Methods of dye application

The application of dyes can be done before, during or after the kapa is completed. As a word of caution, one should never try to dye newly made kapa before it is completely dry – it will fall apart. The fibres need to contract on drying to give it strength. Dyes will behave and absorb differently depending on whether the kapa is made in the retted (*moʻomoʻo* (retted *wauke,* paper mulberry, strips) or *pōpō*) or unretted (*wailiʻiliʻi*) style (see Chapter 4). In the wailiʻiliʻi style, the net-like fibres are more absorbent. Retted kapa, however, are thinner and the fibres more densely packed, more paper-like; they therefore resist absorption of the dye.

Unretted kapa can be folded up and immersed in a gourd dye bath. *Hoʻoluʻu* is to immerse. Alternatively the moʻomoʻo can be dyed individually before they are combined into larger pieces. To intensify the colour, the leftover dye can be added into the kapa as a wetting solution during further beating; when beating kapa, with each pass of the grooved beaters, the kapa must be lightly moistened so that the fibres will move and separate. The *loea* (skilled practitioner) can add the dye to her satisfaction. I think it is unlikely that large sheets of retted kapa were immersed in a dye bath. In my experience, this would put too much of a strain on the thin fragile sheet; the dye will add considerable weight to a finished kapa even after it has dried. Today, some kapa makers use a spray bottle to apply the dye.

Hoʻopaʻa: fixatives and the question of mordants

The question of mordants comes up frequently in discussions of Hawaiian dyes. In my opinion, Hawaiians did not historically use actual mordants in the scientific sense. In the western tradition, mordants are used with protein or animal fibres. The word mordant comes from the Latin verb *mordere,* which means to bite. These are metallic salts of tin, aluminium, copper, iron and chromium which are applied to fibre, such as wool, before it is dyed; they act on the protein fibres to increase their ability to absorb and hold the dye. Plant fibres, such as wauke (*Broussonetia papyrifera*) readily absorb dye and are unaffected by metallic mordants. Also, these chemicals would not have been available in Hawaiʻi in ancient times. It could be argued that some of the mordants listed in *Ka Hana Kapa* (Brigham, 1911) may have mordant-like properties. Crucially, however, their inclusion in the dye mixture is to produce a colour change, not to make the fabrics colourfast. I believe that a fixative or *hoʻopaʻa* is a better word to describe some of the treatments that Hawaiians used in preserving colour on kapa. While some dyes will fade over time, kapa was a generally short-lived product and the colours would have been satisfactory for the life of the piece. Certain kinds of kapa could be washed but generally soiled items would be replaced regularly. Hoʻopaʻa or fixatives help to stabilise and preserve the colour of the dye. Most plant dyes, especially from fruit and flowers, are not permanent. They are referred to as fugitive dyes and will fade or change colour with time and light exposure.

Sometimes the dyes are mixed or overlaid with oils, latex or varnishes to help preserve them. The oils used as fixatives are *kamani* and kukui, which are drying oils and do not leave an oily feel on kapa. Coconut oil was added to kapa as a waterproofing. *Pilali* is the sap from the kukui tree and is water soluble; when applied to the surface of the kapa it makes a shiny varnish. Pilali is also used as a binder for making ink. Tannin-based dyes from bark or leaves are colour stable, and some may darken with age. *ʻAlaea* or iron oxide clays, and *paʻu* (carbon soot) or charcoal-based pigments are very stable and do not need fixatives.

Hoʻololi (modifiers) and hoʻoeaolamāmā (oxidation)

Hoʻololi means to change something. Modifiers are added in small amounts to change the pH of the dyes and thereby change the colour. Many of the Hawaiian dyes from fruit, flowers, and stems are anthocyanin dyes which are very pH sensitive. Most anthocyanin dyes are rather fugitive and can be very bright when first applied but fade with age and sunlight exposure. Some dyes need time to oxidise to develop their colour. Initially I thought some of my dye experiments had failed but then noticed that the colours improved as they dried. This is common knowledge when dyeing with indigo, but little known regarding Hawaiian dyes. I have found that maʻo, maʻohauhele, hau and even some berries like pōpolo and ʻukiʻuki change or deepen in colour when allowed to oxidise.

Some traditional modifiers were burnt coral lime, which was added to noni, sea water, coconut water, egg white and wood ash; these are all basic (alkaline) additives. Acidic dyes come from tannins that occur naturally in leaves and bark. These can be dark brown as in hili kukui or light-coloured when extracted from *Neneleau (Rhus sandwicensis),* our native sumac. I believe light tannin dyes could be added to yellows such as noni or ʻōlena to stabilise the yellow; more research needs to be done to prove this. Darker brown dyes were mixed with yellow dyes to create a yellow brown colour. It is interesting that wood ash is not listed in *Ka Hana Kapa* as I find wood ash to be one of my most commonly used modifiers. When added to various hibiscus flower species I can change the colour from yellow to blue or green. I also add it to my blue ʻukuʻuki (*Dianella* sp.) dye to enhance the blue. Brigham lists urine as a mordant used by Hawaiians but I have yet to find any Hawaiian historic information to substantiate this. This may be a post contact influence, as it is associated with dyeing wool or processing indigo. As kapa was not easily washed, it would be difficult to remove the odour of urine, as you could with washing cotton or wool fabrics.

Conclusion

Hawaiians had a broad ethnobotanical knowledge of the rich diversity of plant species available in Hawaiʻi, and a sophisticated understanding of their properties and the way they reacted with other materials to create different colours. They applied this knowledge to elevate the art of kapa making and dyeing to great heights. My journey in kapa making and dyes has led me to appreciate the depth and the complexity of the Hawaiian culture and its scientific understanding of the environment and its application to daily life (Figure 6.7). A research methodology which combines a knowledge of Hawaiian plants with study of the historical sources and, crucially, with kapa making, has given me new insights and allowed

Figure 6.7. The author (far right) and her Maʻawe Hawaiian Fibre Arts students displaying malo made with Hawaiian dyes.

me to question the received wisdom passed on by authorities such as Brigham and Hiroa which has often been reported in other publications. Today, we struggle to relearn these ancient traditions that were thousands of years in the making through historical scholarship and trial and error. The revitalisation of Hawaiian language and cultural traditions continue to uncover *ʻike* (knowledge) that can be reincorporated into modern practices. Let the journey continue! *E ola ka hana kapa*! Kapa making shall live on!

PART II

UNDERSTANDING TAPA IN TIME AND PLACE

7

Towards A Regional Chronology of Polynesian Barkcloth Manufacture

Andy Mills

This paper discusses prehistoric and historical transformations in Polynesian tapa's manufacture and style over the last three millennia, taking a broadly interdisciplinary, 'phylogenetic' approach after Kirch and Green (1987; 2001), Kirch and Sahlins (1992) and others. Any discussion of tapa's development and diversification over such a vast timespan will inevitably be general and speculative but meaningful observations can still be made. The archaeologically reconstructed pathways of settlement are broadly known, but the chronological details of Eastern Polynesia's settlement (in particular) have undergone significant revision in the last 10-15 years. This framework can be enriched by oral histories, museum collections of fabrics and tools, and historical and ethnographic descriptions of manufacture. Cladistic analysis of mutually exclusive or shared stylistic features between different historical island groups has also provided valuable insights on tapa's principal creative developments (Tolstoy, 2008).[1] Although few writers have directly addressed temporal changes in Polynesian barkcloth, chronological observations have been made before: Hiroa (1944: 429-434) offered a simple three-phase regional chronology of garment development, while various scholars cited below have made useful observations on stylistic chronology for the individual national traditions. Here I synthesise these sources and remarks, adding a few observations of my own from recent collections research, in the hope of providing a slightly clearer regional chronological model for the art of tapa.

1 Tolstoy's (2008) sophisticated cladistic analysis of Polynesian traditions is to be recommended to all readers with a serious interest in this topic. However, I come to slightly different conclusions here concerning the technical divergence between Western and Eastern Polynesia between 300 BC and 1200 AD. Tolstoy deduces that Western Polynesians abandoned initial Eastern Indonesian bast fermentation, and therefore developed pasting composition to achieve larger sheets (cf Kennedy, 1934: 231-232). Conversely, I view the fermentation of *Broussonetia* existing in both Toradja and Eastern Polynesian manufacture to emerge from the influence of refined Chinese paper-making methods diffusing into Sulawesi via Malaysia, Java and Madura in more recent centuries. I take the view that the Eastern Polynesians independently developed bast fermentation on the basis that, had bast fermentation existed in Lapita times, it would have been retained somewhere in modern barkcloth production between Indonesia and the Cook Islands, which it has not.

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Lapita and Ancestral Polynesian tapa, 1200-300 BC

Makers of Early Eastern Lapita ceramics were the first humans to settle Fiji, Tonga, Samoa, 'Uvea and Futuna, circa 1200-1000 BC, and remained exclusively in this region for at least the following five-ten centuries (Green, 1991; Kirch, 1997; Burley, 1998). By the mid-1st millennium BC, the Lapita cultural complex had discernibly developed into what Kirch and Green (2001: 75-83) defined as the Ancestral Polynesian society. Kirch and Green (ibid.: 184-187) explicitly address the Ancestral Polynesian barkcloth complex glottochronologically, and key traits of Ancestral Polynesian tapa style and manufacture (putatively between the 6th and 1rd centuries BC) can also be cladistically inferred from the fact that every descendant Polynesian tradition has either inherited the same fundamental technical and technological complex – or its replacement can be explained by changes according with Polynesia's subsequent patterns of settlement and interaction.

Paper mulberry (*Broussonetia papyrifera*) and breadfruit (*Artocarpus altilis*) were both adventive fabric 'canoe plants' carried into Western Polynesia during this period (Yen, 1991; Whistler, 2009). The pantropical native banyan (*Ficus prolixa*), historically exploited from Indonesia as far east as Tahiti, was almost certainly also used. Direct historic ethnohistorical analogies in Western Polynesia (see Mills, Chapter 2) enable us to infer that a short pre-beating soak of the harvested bast was common before the 1st century BC. However, neither a prolonged retting soak, nor bast fermentation, are direct-historically supported for Ancestral Polynesia. Consequently, it is probable that rudimentary *pre-fusing* of the edges of fresh bast sheets together (see Mills, Chapter 2) was the primary joining method of the Ancestral period, although pasting with Polynesian arrowroot (*Tacca leontopetaloides*) may have also existed in some form.[2] There is good circumstantial evidence that both round-sectioned and square-sectioned barkcloth beaters were used in Ancestral Polynesia: in historical times, round beaters were still used in parts of Fiji and Samoa, and throughout the Marquesas Islands, Hawai'i and Rapa Nui. Later finds discussed below support this, also suggesting that the strongly tapering form of square-sectioned beaters in 19th-century Western Polynesia closely approximated the original Ancestral Polynesian *ike*.

The *malo* loincloth is linguistically attested for the Proto-Polynesian (PPN) language spoken in Ancestral Polynesia (Kirch and Green, 2001: 186). Knee-length *lavalava*/*pareu*/*pa'u* skirt or kilt forms existing throughout Polynesia circa 1800 AD suggests that (terminology notwithstanding) they too were a key garment form before the Christian era. Conversely, shoulder cape and *tiputa* poncho forms were absent from 18th-century Western Polynesia and likely arose further east in post-Ancestral times. The decorative diversity of 19th-century tapa makes it unlikely that *any* recent styles closely resemble those of Ancestral Polynesia. Pandanus-key brushes and wads of tapa were probable hand-painting tools, although dyeing, printing and rubbed decoration were almost certainly unknown. Later ubiquity and glottochronology indicate that the saps of candlenut (*Aleurites moluccana*) and *koka* (*Bischofia javanica*) were used to glaze and waterproof tapa. It is equally likely that candlenut soot was mixed into these saps for a good black, and that turmeric provided

2 This is glottochronologically unclear as *pia* was an important secondary carbohydrate food, and a 'canoe plant' in its own right. The species used for starch paste in the Ancestral Polynesian period is also not inferable with certainty: in 19th-century Western Polynesia, both *tou* (*Melochia aristata*) and *taro* (*Colocasia esculenta*) were also used.

a warm yellow. Kirch and Green (2001: 187) remark that we presently cannot be certain that ochre was also used to redden and opacify sap colourants, although it is highly likely. Already a technically sophisticated art form, then – with significant similarities to some recent barkcloth of Western Polynesia – Ancestral Polynesian tapa was simpler in its toolkit, fabrics, colourants and decorative iconography.

Tapa in Eastern Polynesia, circa 300 BC – 1200 AD

Of the large archipelagos in Eastern Polynesia, the Cook Islands and Marquesas Islands have both been convincingly shown to have been settled from Samoa between 300 BC and 150 AD; problematically, however, no reliable radiocarbon dates before 900 AD have yet been derived from the Society or Austral Islands (Anderson and Sinoto, 2002).[3] Economic and social interactions were seemingly regular and widespread within this region between 400 and 1600 AD (Weisler et al., 2016), constituting a meaningful cultural interaction sphere. During this period, Hawai‘i was discovered twice: initially from the Marquesas Islands circa 300-400 AD, and then again from Tahiti circa 1200 AD (Beckwith, 1970: 334; Elbert, 1982; Kirch, 1985: 87; Hunt and Holsen, 1991).[4] Recent recalibration of radiocarbon dates has pushed forward the earliest settlement of Rapa Nui from the Marquesas Islands to a similar date, around the year 1200 AD (Hunt and Lipo, 2006; 2011), and of Aotearoa New Zealand from Rarotonga to the early 1300s AD (Walter, Buckley and Jacomb, 2017). We can therefore plausibly infer that technological traits shared between the Cooks, Societies, Australs, Marquesas, Hawai‘i, Aotearoa New Zealand and Rapa Nui – which are also absent in Western Polynesia – reflect common developments in Eastern Polynesian tapa making over the period 300 BC – 1200 AD at its lengthiest span. This second cultural substrate of technological choices indicates several innovative modifications to the Ancestral Polynesian methodology.

First, there was an expansion in the duration of the preliminary bast soak to become a prolonged retting. Second, a method for fermenting retted bast developed, which drew on pre-existing techniques for the preservation of carbohydrate foods. Third, these preparation techniques enabled the bast's fusing into a single sheet during beating. A culture of technical experimentation in Central Polynesia during this period transformed paper mulberry into an almost fully plastic material; eliminating the fibrous natural structure of the bast and producing paper-like sheets of extreme thinness and largely unlimited size.

These developments in bast manipulation led to key changes in the form of barkcloth beaters and their linear beater marks. Both square-sectioned (Figure 7.1a) and cylindrical (Figure 7.1b) beater forms were in parallel usage during the 19th century in parts of Fiji and Samoa, and throughout the Marquesas Islands and Hawai‘i (Kooijman, 1972: passim; Clunie, 1986; Hooper, 2016). The cylindrical beater's use with stone anvils is only recorded *historically* for the Marquesas Islands, Hawai‘i and Rapa Nui. However, the remarkable assemblage of wooden tools excavated by Sinoto (1979: 11, 34) from a waterlogged 11th century domestic site at Fa‘ahia on Huahine in the Society Islands shows that women

3 Common sense would suggest that settlement in all four archipelagos likely predated 100 BC, but we must presently work on the basis that Tahiti may have remained undiscovered for as much as a thousand years after the southern Cooks and Marquesas Islands.

4 As Hawai‘i was settled in two distinct migration episodes, one from the Marquesas Islands circa 300 AD and another from the Society Islands circa 1200 AD, it presents a more clouded inferential data set.

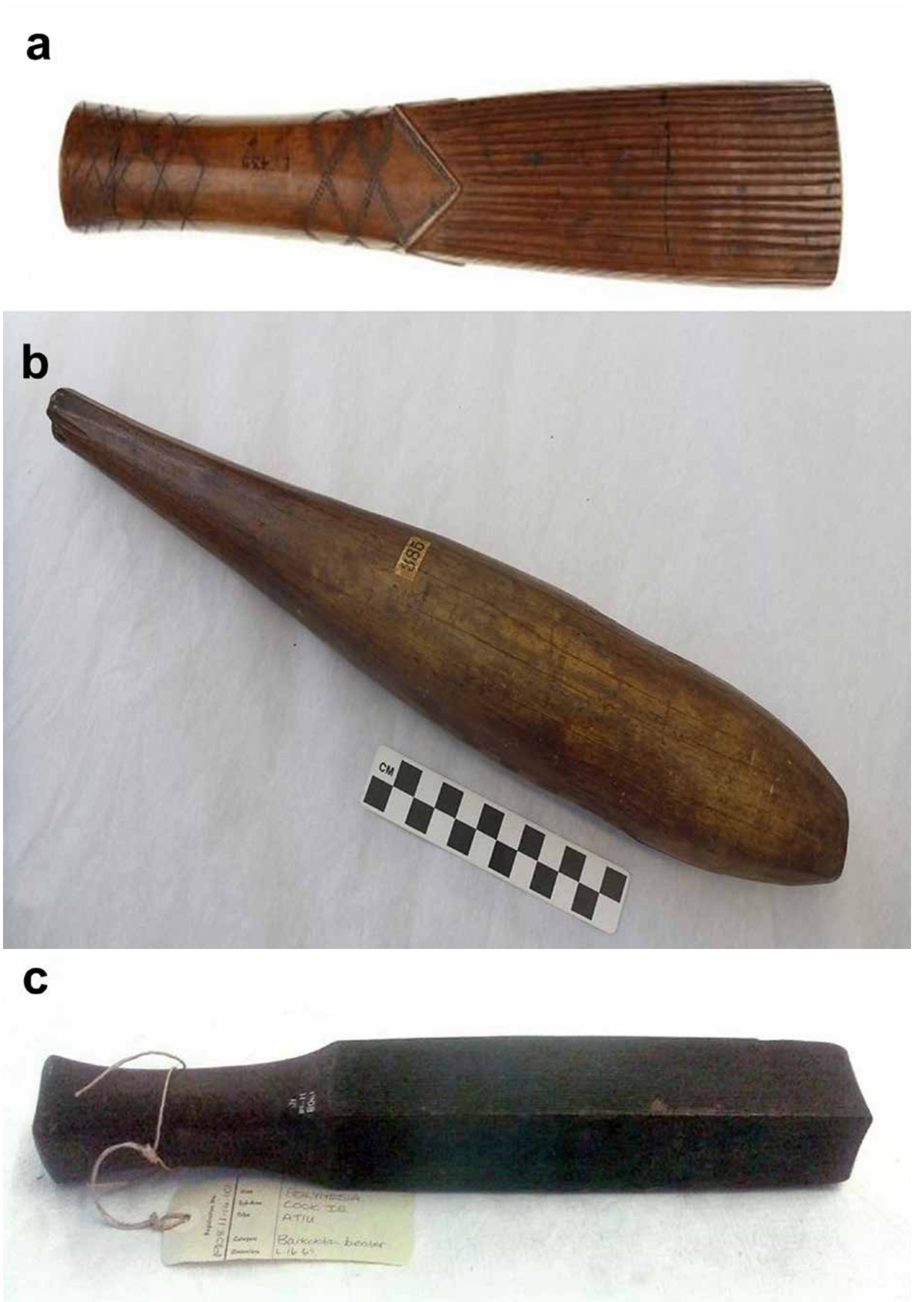

Figure 7.1. Chronological development of Polynesian beater forms: a) Niuean ike of strongly tapering, typically Western Polynesian form (The Hunterian, GLAHM: E.439/2). b) Round-sectioned Hawaiian *hohoa (*Bernice Pauahi Bishop Museum, BPBM 885). c) Cuboidal i'e of Atiu, Cook Islands (British Museum, Oc 1908.11-14.10).

there were also using a large square stone anvil, and round-ended cylindrical beaters of the Marquesan-Hawaiian type. However, they were also using square-sectioned, slightly tapering beaters; longer and more intensively grooved than the more tapered Western Polynesian ike, but less intensively grooved than cuboidal *i'e* of the 18th-century Society Islands. The square-sectioned form had become entirely dominant in the Cook Islands by the 14th Century (Figure 7.1c), when it alone was carried from Rarotonga to Aotearoa New Zealand. An appropriate inference is that the inherited square-sectioned beater form of Western Polynesia was lengthened in Eastern Polynesia to span the width of the anvil, becoming increasingly cuboidal and more intensively grooved over the early second millennium AD. This enabled the later Central Polynesian beaters of the period 1100-1400 AD to more effectively fuse and standardise sheet thickness in larger areas, facilitating the elaboration of fine linear beater marks for aesthetic purposes.[5] Consequently, it appears that round-sectioned beaters dwindled in popularity throughout Western and Central Polynesia; however, this diminishment had not occurred in the Marquesas Islands by the time of Hawai'i's settlement in the 4th century AD, nor Rapa Nui's circa 1200 AD, nor even by the 19th century.

A stark aesthetic divergence is evident in Eastern Polynesian barkcloth of the period 1775-1825, between the complexity and range of Society, Austral and Cook Islands tapa types on one hand, and the comparative simplicity of Marquesan and Rapa Nui tapa on the other. In addition to the conservatism in beater designs outlined above, several commentators remark on the environmental challenges to producing abundant quantities of *Broussonetia papyrifera* in the Marquesas Islands and Rapa Nui; both cultures seem to have adapted to this by generally wearing smaller and fewer garments – a sartorial habit clearly also carried to Hawai'i in the 4th century, and therefore quite an early development (Wilson, 1799: lxxiii-lxxvi; Beaglehole, 1969, II: 355, 374-375; Beaglehole, 1969, III: 1179-1180; Kjellgren, 2001; Kjellgren and Ivory, 2005). A narrow range of colourants was used in the historical barkcloth of the Marquesas Islands and Rapa Nui, little extending that of Ancestral Polynesia. These factors have important implications for how we should model early Hawaiian *kapa* between the 4th century and the Tahitian migration; it is reasonable to expect that it was also simply constructed and decorated with a limited palette of immersion-dyed and hand-painted saps, turmeric and candlenut soot.

During this period, however, the first Hawaiians were also botanising and domesticating a vast new ecosystem, revealing a wealth of endemic fabric and colourant plants (see Schattenburg-Raymond, Chapters 4 and 6). While the ancient Marquesans brought *Artocarpus altilis*, and seemingly also *Broussonetia papyrifera*,[6] to Hawai'i, the unavailability of *Ficus prolixa* in Hawai'i – likely already a spiritually important tree and cloth in Ancestral Polynesian times – was no doubt a loss keenly felt. Perhaps it was this

5 Fine linear beater marks cannot be imparted to unretted or double thickness pasted tapa, as the organic fibre bundle forms overpower such delicate patterns. It should also be noted that some vestigial taper can still be identified in early Māori beaters excavated in Aotearoa New Zealand (Neich and Pendergrast, 1997b: 88-89; see Wallace, Chapter 13).

6 Hawai'ian oral history suggests that *Broussonetia* was unavailable for kapa making in the earliest period of prehistory; breadfruit and the endemic *māmaki* were used instead (Hiroa, 1957: 167-168). This is more plausible than it might seem, as *Broussonetia* was historically in short supply in the Marquesas, and breadfruit the commonest tapa species (Kooijman, 1972: 179). In such a context, māmaki and the other endemic Hawai'ian Urticaceae would have made admirable additions.

which motivated the search for other kapa fabric plants and colourants, as well as ochre sources. Another notable collective feature of Marquesan, Hawaiian and Rapa Nui culture was the historical production of anthropomorphic images in barkcloth over a basketry armature, a set of artefact types that were closely related – perhaps ancestral – to the 18th-century featherwork deity images of Hawai'i and the basketry images of Rapa Nui (Luomala, 1973; Kaeppler, 2003).

Unlike further east, Societies, Cooks and Australs women paralleled these technical developments in bast preparation and fabric manufacture with a willingness to extend and transform the operational sequences of decoration and colourant production. A wider variety of sap-based colourants was used in Central Polynesia than elsewhere, and the documented colourants of the historical Cook and Society Islands reflect their varied experimental mixing with one another and additives such as *tuitui* soot. Modulation of the liquid base for aesthetic reasons (rather than environmental necessity) liberated Central Polynesian tapa colourants, leading to sap's substitution with clear, light-coloured oils from coconuts, unburnt candlenuts or *tamanu* nuts (*Calophyllum inophyllum)*, as well as coconut cream in the Cook Islands (and probably elsewhere). While oiling offered waterproofing and shine, it primarily enabled an aesthetic shift to lighter, clearer colours; both more vibrant and more subtle (Kooijman, 1972: 15-24, 50-51, 76-77). Some rudimentary practice of printing with bamboo stamps evidently developed in the Society Islands during this period (probably the later part) as it was carried to Hawai'i from there during the 13th century in some rudimentary form. Equally, the *rakau takiri pa'oa* stamping-frames of 19th-century Aitutaki (Hiroa, 1944: 74) suggest that printing may have had a more complex history in Central Polynesia than recent collections suggest. These key changes in Central Polynesian tapa decoration during the late first millennium AD enabled remarkable Hawaiian achievements in fabric, colour and iconography from the 13th century onwards.

Western Polynesia, 300 BC – 1500 AD

In parallel with these technical and aesthetic developments in Central Polynesia, Western Polynesian tapa also developed over the first millennium AD, albeit in more subtle ways. It is not as simple to delineate chronological watersheds in the west as in Eastern Polynesia. A key reference point here is the settlement of Polynesian Outlier societies from Futuna, 'Uvea and Tuvalu in the north of Western Polynesia, between the 14th and 16th centuries (Blake et al., 1983; Feinberg and Scaglion, 2012). The Ellician language-speaking Outliers provide little inferential data on tapa as it was an unimportant art in Tuvalu itself; however, the Futunic language-speaking Outliers are useful comparators.[7] Tapa fabrics of Tikopia, Rennell and Bellona, are notably unpainted and either richly immersion-dyed with turmeric (for chiefly prestige or spiritual significance), or left the natural colour of the material itself (Firth, 1947; Neich and Pendergrast, 1997b: 120-123, 130). The implication is that, despite the remarkably complex decoration of Futunan and 'Uvean tapa during the 19th century (see Guiot, Chapter 12), that development occurred after 1500 AD; there are good reasons (outlined below) to suspect a similar late efflorescence of ornamentation across Tonga, Samoa and Fiji. Other common features of Western Polynesian and Futunic

7 The Futunic language-speaking Outliers include Tikopia, Rennell and Bellona (Solomon Islands); Ouvea (Loyalty Islands, New Caledonia); West Futuna, Aniwa, Mele, Emae and Anuta (Vanuatu) (Feinberg and Scaglion, 2012).

Outlier tapa include their production and presentation in large accumulations for weddings, funerals and chiefly investitures; and their wearing restricted to malo, lavalava-style wraps evocative of fine pandanus mats, and headcloths. That said, Outlier cloths were single-layer and minimally pasted or 'pre-fused' (if at all), generally being worn in a 'one sapling-one garment' form; this implies that the more complex two-layer pasted compositions of 'Uvea, Futuna, Samoa, Tonga and Tonganised Fiji truly developed in the last 500 years.

Many 19th-century Western Polynesian cultures retained a taste for a muted palette of browns, blacks and creams, reflecting a profound appreciation of subtle tonal gradations (see Veys, Chapter 11). This is abundantly evident in museum collections of Tongan, Samoan and Fijian art, where subtle variations in the colour of pandanus strips or plaited coconut fibre are turned to powerful effect – or gently enhanced by seawater bleaching, smoking, or iron tannate mud immersion (St Cartmail, 1997; Mallon, 2002; Hooper, 2016). Viewed in their proper aesthetic context, therefore, the muted natural colours and organic fibrous structures of unretted barkcloth are the essence of its beauty.

Western Polynesia and the Outliers 1500-1800 AD

After 1500, tapa style in Western Polynesia differentiated significantly. Oral histories, chiefly genealogies and technological variations can inform us about sociocultural and stylistic developments that occurred in Western Polynesia between this time and the beginning of extant museum collections in the late 18th century. Historical sources suggest that the movement of people, commerce in tapa, and interaction with Tuvalu and eastern Micronesia, significantly increased over this period (Gifford, 1929; Derrick, 1963; Faaniu, 1983; Reid, 1990; Campbell, 2001).

As part of the technical development of Western Polynesia's post-1500 double-layer fabrics outlined above, a divergence occurred between: a) fabrics of Tonga, Fiji, Rotuma and 'Uvea, which are pasted at the seams and edges only; and b) fabrics of Samoa, Futuna and Niue which are continuously pasted throughout (see Mills, Chapter 2). Broadly covariant with compositional method a) is the construction of great barkcloths of enormous length, an essentially Tongan development reflecting greater collectivisation of productive labour, and the identity politics of style in dress.

Key developments in garment form, however, are perhaps more obvious. *Wabale* sashes appear to have been an indigenous Fijian development, as were the extreme fineness and pleating of *isala* turbans in *seavu* fabric. The delicate tasselling of garment edges seems to have spanned Fiji and Rotuma (Kooijman, 1972: 284-285; Hooper, 2016). In Samoa, Futuna and Niue, the standardisation of the *siapo*, *sala* or *hiapo* to an approximate size of 1.8m by 1.5m also seems to have occurred after the 1500s in conjunction with serrating the garment's edge for an aesthetic hemline on knee-length lavalava. The Tongan *vala*'s lengthening from breast to ankle equally occurred after 1500 AD.[8] Even in the late 19th century, such long vala were only found as *sulu vakatoga* in parts of Fiji which had experienced significant post-1500 Tonganisation, or in Samoan elite dress as probable sartorial indicators of some Tongan genealogy (Derrick, 1963: 118-131).[9]

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8 If Isaac Gilsemans' 1643 images of *sisi*-wearing Tongans are any guide, this lengthening occurred after the mid-17th century (see Veys, 2017: 17-19).

9 The rise of the Tu'i Kanokupolu dynasty in Tonga from around 1550 occasioned a period of cultural convergence in Tonga and Samoa alike (Campbell, 2001: 43ff; Mills, 2018: 247-248, 253n35).

As mentioned, the almost complete absence of compositional and decorative complexity in Futunic Outlier tapa indicates that decoration in Western Polynesian tapa primarily developed after 1500, and that turmeric dyeing was abandoned, and painting highly restricted, in Western Polynesia since then. Some pieces of Fijian seavu may be found in 1770s collections which were acquired in Tonga during the British visits (Shaw, 1787). Samples of stencilled Fijian *masi* also occur in the Shaw albums, although they are much whiter, and more focused on compositions of squares instead of bands, than the dark stencilled Fijian *masi kesa* of the 19th century (Figure 7.2a). Though absent from such early collections, *masi kuvui* smoked barkcloth was also (self-evidently) a highly refined endemic Fijian practice long before the 1800s.[10]

Samples of Tongan *ngatu tahina* collected on the Cook voyages (1773-1777) show that 18th-century *kupesi* pattern rubbing boards were simpler than those used later, taking three principal forms. The National Museum of Ireland's 18th-century kupesi consists of two layers of coconut fibre cordage looped back and forth in parallel lines, the upper layer running transversely and the lower longitudinally (Hand, 2015: 44; Figure 14).[11] The coconut leaflet pinnules creating straight lines on Tongan, Samoan and Fijian rubbing boards of the 19th century are notably absent in this example (cf Beaglehole, 1969, III: 172). However, Tongan *ngatu* samples in the Shaw (1787) albums, and other collections of Cook-voyage tapa, show rubbing patterns of parallel arcs of cordage looping back on itself, linear kupesi utilising short lengths of pinnule, and thick rectilinear patterns created using four-cord bands secured with overcast stitches (Figure 7.2b). The other style of 1770s ngatu tahina decoration is most similar to this third structure and indicates large-scale kupesi constructed with solid raised sections 5-10mm wide, most likely slats of split cane (Figure 7.2c). Unlike the looped cordage kupesi, they render several motifs familiar from modern ngatu, and Classic Tongan engraving. Another distinctive feature of 1770s ngatu is the almost complete absence of *tukihea* – secondary overpainting to delineate the edges of kupesi panels or add distinctive circular elements.

Cognate rubbing decoration was absent altogether from Fijian cloth produced outside of those areas experiencing Tongan cultural influence from the mid-1500s onwards (Figure 7.3a; Derrick, 1963; Kooijman, 1972: 359-365). It remains unclear how much of the Lau Islands' *gatu vakaviti* cloth was locally rubbed with *kupeti* boards identical to Tongan kupesi, and how much was imported ngatu tahina from Tonga then locally stencilled to Fijianise it (Figure 7.3b; cf Hooper 1995). In Samoa, similarly, rubbing decoration became increasingly popular over the later 19th-century, gradually replacing the dominant hand-painted style (Figure 7.3c). In the upper Sigatoka catchment of central Viti Levu, however, slightly convex planks bound with transverse linear fillets of split bamboo, and grooved bamboo cylinders (*bitu ni kesa*), were used to rub on coarsely hatched and finely cross-hatched decorative zones (Figure 7.3d; Ewins, 1982; Neich and Pendergrast, 1997b: 98-100), essentially a simplified variation of the slatted 18th-century Tongan rubbing form described above, which was seemingly disseminated into Noikoro and Navosa through the early 18th-

10 Smoking was a more general aesthetic enhancement in Fiji, which can equally be seen on *tabua* whaletooth valuables, ivory sculptures and other precious things (Clunie, 1986).

11 NMI 1897.284.

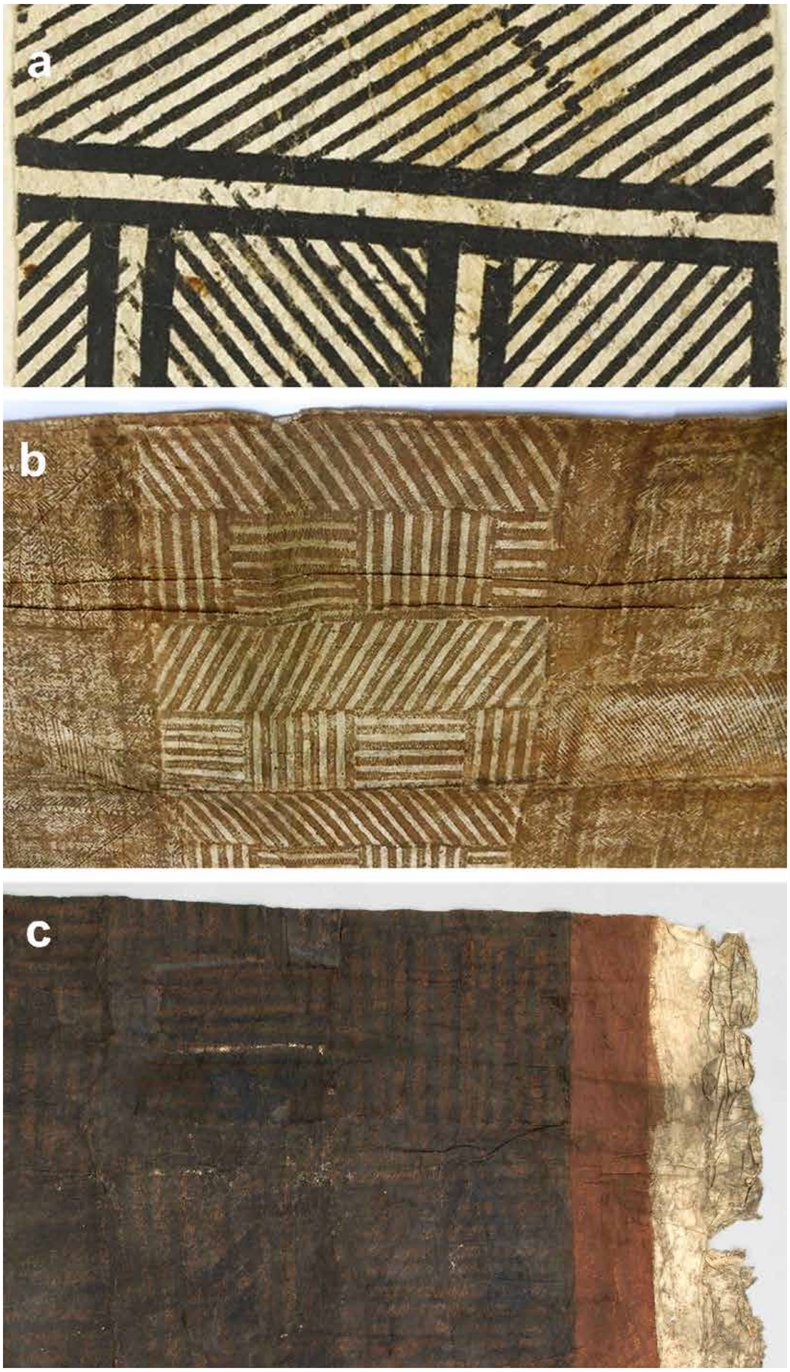

Figure 7.2. 1770s decoration of Western Polynesian barkcloth: a) Monochrome Fijian masi showing stencilling style of the 1770s, possibly originating in Cakaudrove. From Shaw, 1787 (University of Glasgow Library Special Collections, K5.22). b) Tongan ngatu tahina collected by Johann Reinhold Forster, 1773-1774. Three distinct styles of kupesi composition are indicated (The Hunterian, GLAHM: E.417/8). c) Heavily glazed 1770s ngatu 'uli using a slat-based kupesi with cordage cross-hatching (The Hunterian, GLAHM: E.458/5).

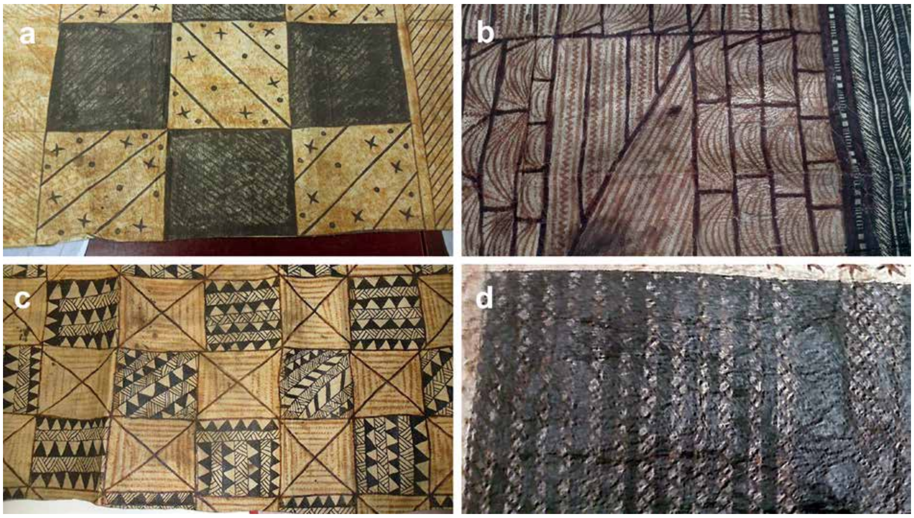

Figure 7.3. Diffusions of Tongan rubbing decoration into Fijian and Samoan barkcloth: a) Black-rubbed and cross-hatched Tongan ngatu of late 18th-century style (The Hunterian, GLAHM: E.668). b) Gatu vakaviti of the 1880s, Lau Islands, Fiji, showing typical Tongan-style *koka'anga* of the period (The Hunterian, GLAHM: E.458/3). c) Transitional Samoan siapo circa 1850, combining elements of hand-painted siapo mamanu with rubbed siapo tasina decoration (The Hunterian, GLAHM: E.592/1). d) 1880s masi of the upper Sigatoka River catchment, probably Noikoro (University of Aberdeen Museums, ABDUA 11089).

century Tongan settlement of Korotoga at the mouth of the Sigatoka, the style itself being superseded in Tonga after 1800. The *masi bolabola* of Cakaudrove sometimes contains similarly cross-hatched hatched (but seemingly liner-stamped) decorative infill on red borders, which may also be related to this 18th-century Tongan aesthetic.

Central Polynesia, 1300-1800 AD

Between the 14th and 18th centuries, Central Polynesian tapa underwent both collective development and local divergence. Because the principal regional developments of Central Polynesian barkcloth technology occurred before this time, the period through to 1800 was primarily one of diversification and refinement in fabric types and decoration. Bast preparation and compositional fusing techniques were largely the same in the Society, Cook and Austral Islands, and certain closely cognate fabric types were produced throughout the three archipelagos. Equally, it was in this interaction sphere that tiputa ponchos arose as a garment form – a useful innovation that evidently post-dated the settlement of Aotearoa New Zealand and Hawai'i.

Nevertheless, there were important differences between the range of fabrics produced in each archipelago and between different islands in the same group. By the end of the 18th century, Society Islands cloth exhibited an intensity of linear beater marks (12-13 grooves per centimetre) which exceeded any other part of Polynesia. Conversely, Cook and Austral Islands tapa rarely exceeded 6-9 grooves per centimetre, and was rarely thinner than 0.3mm. Beyond the Society Islands we see a greater variation in fabric types and decorative systems between islands. Little can be said with certainty concerning Austral Islands barkcloth at this time (but see Richards, 2012: 167-179 and Adams, 2016). It is now clear, however, that southern Cook Islands tapa had diversified into a set of island-specific art styles by 1800, some of which were exclusive to genealogical groups, firstborn sons, or the chiefly class (Wyatt Gill, 1892: 16; Hiroa, 1944: 65; Kooijman, 1972: 55-56; Hooper, 2006: 224-225; Teiotu, 2007; Scothorn, 2015: 138-147; Mason, 2018).

By the 1760s, Society Islands artists had developed a complex range of rebeaten and rubbed fabrics. A related technique of pasted applique collage found in both the Societies and Pitcairn was no doubt a similar late innovation. The perfection of extremely large and fine, paper-white *hopū* cloth, however, was perhaps the most influential development, as it enabled a strong aesthetic preference for the red-stamped decorative elements on a yellow immersion-dyed ground, which dominated contact-period fashion. Late 18th-century stamp-printing in the Society Islands was undertaken with the end of a bamboo cane, to produce rings and (either by splitting the stylus or using it obliquely) C-shapes (Kooijman, 1972: 18-21). It appears that the whimsical gestural action of printing was more important than a rigidly predetermined composition, although early *ʻahufara* cloaks do bear stamps in linear arrangements, boxes and circular clusters; some of which approach the representational (see Figure 7.5a below).

Hawaiian kapa, 1200-1800 AD

At the time of the 13th century Tahitian migration to Hawaiʻi, Society Islands *ʻahu* production was almost certainly the most technically advanced in Polynesia. The pre-existing kapa technology of the original Marquesan settlers, enhanced by almost a millennium in the unique environment of Hawaiʻi, undoubtedly brought endemic Hawaiian fabric and colourant species into use, generating new cloth types and cultural associations (see Schattenburg-Raymond, Chapters 4 and 6; Mills, Chapter 1). The convergence of these two traditions hybridised into a textile art of unparalleled range and complexity in Oceania.

It is clear that the experimental development of new fabric production techniques characteristic of Central Polynesia before 1200 AD continued just as creatively in Hawaiʻi over following centuries as it did in Tahiti itself. We see a parallel proclivity to the Tahitian layering and recombination of fabrics: Beckwith (1970: 361) records that the five-layer paʻu skirt was introduced by the early Tahitian settler Luʻukia. Similarly, typically five-layer *kapa moʻe* sleeping covers arose in this post-Tahitian period. *Kapa paʻupaʻu* fabrics, produced by unifying two cloths of different colours so the finished article was differently coloured on each face (of which the red-and-white *paʻiʻula* was the most popular subtype), also emerged during this period (Figure 7.4a; Hiroa, 1957: 183-186; Kooijman, 1972: 122-123); grooving techniques and tools are another post-1200 phenomenon closely associated with kapa paʻupaʻu production. Equally, Kooijman (ibid.) shows that the practice of shredding plant fibres, or dyed fabrics, and beating them into a white base cloth to create a mottled effect was highly refined long before the 1790s (Figure 7.4b). Other notable decorative developments in this period include further processual complexification of black iron tannate mud dyes (Figure 7.4c); the amalgamation of Tahitian oil-based colourants with Hawaiian pigment plants and ochres; and the uniquely Hawaiian method of pouncing bagged wood ash into fabric to delicately mottle it blue-grey (Figure 7.4d; Hiroa, 1957: 186-189).

However, while it is tempting to believe that the great plethora of Hawaiian fabric types and decorative styles were all fully formed when historical collections of kapa began in 1778, this seems not to be the case. Although Abbott (2002: 5) cautioned against taking such absence of evidence as concrete evidence of absence, beater marks are absent from

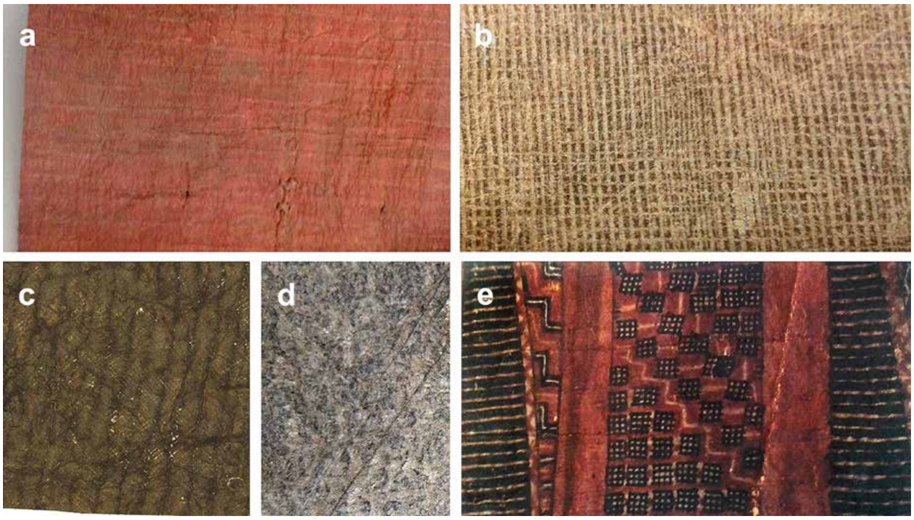

Figure 7.4. Hawaiian innovations, 1200-1800 AD: a) Double-faced kapa paʻupaʻu unified two sheets of different colours. Grooving the cloth is a closely interrelated technique. From Shaw, 1787 (University of Glasgow Library Special Collections, K5.22). b) Incorporation of māmaki fibres or shredded fabrics into a fresh kapa base was long established before 1800 AD (Honolulu Museum of Art, HMA 926.4). c) Complexification of iron tannate mud immersion for black dyed fabrics (The Hunterian, GLAHM: E.599). d) Ash pouncing produced a delicate blue-grey (The Hunterian, GLAHM: E.611/3). e) Simple rectilinear liner stamps and oil-based ochre paints dominated Hawaiian fabrics of 1778-1779 (The Hunterian, GLAHM: E.598/4).

almost all the kapa samples collected on Cook's third voyage. Indeed, only a fine regular 2mm grid beater-marked fabric, dyed greyish-black, appears in 18th-century Hawaiian collections (Shaw, 1787; Thomas, 2019). Similarly, we only find simple rectangular *ʻohe kapala* stamps of 2-3mm or 5-6mm wide 'liner' type on Cook third-voyage kapa, boldly deployed in combination with larger hand-painted decorative zones (Figure 7.4e; Kaeppler, 1975: 8; Hooper, 2006: 88-89).

Western influence after 1760

Late 18th- and early 19th-century western interests in Polynesian barkcloth amounted to little more than academic curiosity, and early European responses to Polynesian dress-ways had spanned admiration, incomprehension, shock and sexual titillation (Tcherkézoff, 2003: 58-66; Salmond, 2009: 29, 95-97). Early imperialist interest in tropical Polynesia's small islands largely revolved around their logistical value as sources of fresh water and food for merchant shipping and whalers between the western Americas and China (Hooper, 2006; Thomas, 2010). Polynesian demand for brightly coloured or intricately patterned exotic woven fabrics is evident in the earliest historical sources and grew with the increase in this shipping over the first quarter of the 19th century (Tcherkézoff, ibid.: 51-60; Beaglehole, 1969, III: 160, 959). For all the delicacy of the finished fabric, barkcloth production is hard physical labour, and generates a comparatively ephemeral textile. Consequently, within economic systems which were already oriented towards the circulation of exotic foreign fabrics in large quantities, woven cloth was immediately among the most desirable commodities that western voyagers brought. The labour-intensity and limited scalability of tapa production stood little competitive chance against the slavery-based cotton plantations and industrial textile mills of the west, or the vast labour force of India's weavers.[12] From 1800 onwards, western shipping between the Americas and Asia effortlessly saturated Polynesia with trade cloth, steel tools and firearms; simple market forces ensured that the future of tapa's production was threatened. Equally, a succession of European-borne disease epidemics utterly devastated the region from the 1820s onwards (McArthur, 1967). Mass depopulation, exacerbated by 'blackbird' slave raiders, engendered the loss of traditional technical and ecological knowledge. Conjoined with the market forces outlined above, such factors heavily eroded the cultural system and physical skills of tapa production across the region.

Christian missionaries arrived in Central Polynesia from 1797 onwards, but their wider dispersal into Polynesia largely occurred over the 1820s and 1830s (Lovett, 1899; Gunson, 1978). With good cause, much responsibility for the transformation of dress culture in Polynesia has recently been placed at their door (Eves, 1996). They undeniably sought to suppress the production and use of ritually significant fabrics in some areas, particularly Central Polynesia. More importantly, however, they espoused a belief that *how much* one covered the body, and *with what*, materially indexed a fundamental ideological cluster: Christian faith and the rejection of paganism; sexual abstinence, monogamy and heterosexuality; hygiene and industry (Küchler, 2003; Thomas, 2010: 96-125). Dress was constructed as a principal material lever of moral, social and spiritual acculturation. Cotton seeds and looms were introduced; young girls were taught needlework and tailoring; European Christians sewed and donated dresses and bonnets for shipping to Oceania; a culture of extreme bodily concealment followed the Gospel wherever it went (Pitman, 1836; Küchler, ibid.: 104-105).

Nevertheless, it would be incorrect to view the 19th century as wholly a period of tapa's decline, replacement and suppression (Neich and Pendergrast, 1997b: 10-11), or to consider Christian mission and western trade as wholly destructive to the art of tapa. In general, Protestant missionary ideology framed local women's textile arts as morally acceptable media of productive craft (Colchester, 2003: 6), divertible to their sartorial salvation. The history of the tiputa poncho is a principal case in point (Thomas, 2003): a popular 18th-century garment form in the Society, Cook and Austral Islands, it was promoted by European and Polynesian missionaries of the London Missionary Society as a means of encouraging converts elsewhere in Polynesia to cover their upper bodies. It was exported to Samoa and Hawai'i in the 1820s and 1830s; to Niue in the 1850s; there is even some evidence of a tiputa-like garment termed *leuleu* or *penu* worn by Tongan women in the late 19th century (Hiroa, 1944: 433-434). The spread of Christianity and the tiputa went hand-in-hand. Over the same time span, the introduction of western scissors and pinking shears influenced the style of Central Polynesian tiputa: on Mangaia in the Cooks, an 1830s-1850s upwelling of decorative cut-work occurred, alongside the cutting and pinking of tasselled fringes (Kooijman, 1972: 61; Küchler, 2003: 101-102). This tasselling trait was transplanted to Samoan and Niuean tiputa a few decades later. In other decorative aspects of tiputa style, each archipelago or island followed its domestic aesthetic to create a range of local adaptations.

12 The early botanist of Hawai'i, Willhelm Hillebrand (1861: 2) speculated that barkcloth production might undergo some degree of industrial upscaling and mechanisation to provide an export commodity for Polynesia, but this view never seems to have gained wider credibility.

Western Polynesia, 1800-1950 AD

Having discussed 18th-century Tongan kupesi boards above as either cordage-based and curvilinear, or based on thicker cane slats, we can recognise that the widely-published form of Tongan kupesi on a base of lapped *Pandanus*, overstitched with coconut leaflet pinnules to create the upper depth-register, arose in Tonga after the 1770s. William Mariner described Tongan kupesi around 1805 as 'formed of the dried leaves of the paoongo [sic] sewed together so as to be of a sufficient size, and afterwards embroidered, according to various devices, with the wiry fibre of the cocoa-nut husk' (Martin 1817, II: 291). Thus, we can recognise an overlapping stylistic succession in Tongan kupesi structure and iconography over the 19th and 20th centuries: from cordage alone or coarse slatted motifs (possibly built directly on the *papa koka'anga*) in the 18th century, to cordage on a reinforced pandanus base, to cordage and pinnules on a pandanus base. Veys (2017: 97-100) has observed that representational and textual kupesi motifs, for which Tongan ngatu is famed in the key works on Pacific art, cannot be considered at all common until the third quarter of the 19th century. While rectilinear zones containing pinnule-based texts appeared from the mid-19th century, other pictorial kupesi motifs referencing the royal family, imported western technology and so on, only appeared in the last quarter of the 19th century and should be properly viewed as a 20th-century phenomenon (Tamahori, 1963; Kaeppler, 1999: 35-38).

It is not simple to talk of earlier historical changes in Samoan siapo, as no *in situ* collections predate the United States Exploring Expedition's 1839 visit. While the earliest available *'upeti*-rubbed Samoan *siapo tasina* of the 1830s-1850s bear a remarkable resemblance to contemporary Tongan ngatu tahina, hand-painted *siapo mamanu* were by far the most popular traditional style throughout the 19th century (Figure 7.3c; Neich and Pendergrast, 1997b: 15-16, 24-25; Scothorn, 2007). Primarily monochrome in black or brown, occasionally enhanced with turmeric, their early iconography was geometric and band-zoned, strongly reminiscent of *tatau* iconography. Even these earliest extant siapo contain some representational foliage elements (repeating lanceolate leaves), and this mixed geometric-foliate iconography was transplanted to Niuean hiapo in the 1850s by Samoan missionaries of the London Missionary Society (Turner, 1861: 517*ff*). Thus, while rubbed decoration became increasingly popular in Samoa over the later 19th century, and 'upeti increasingly unified vegetal and geometric forms, rubbing was never introduced to Niue. Later 19th-century Niuean hiapo artists developed the imported foliage motifs rather than the geometric ones, adding in evermore representational motifs (Kooijman, 1972: 288-295; Pule and Thomas, 2005). Due to the advent of steel chisels and gravers, from around 1920 onwards Samoan siapo tasina underwent a further transition to the use of carved wooden 'upeti. This profoundly altered the style of siapo tasina by enabling an increased preference for curvilinear designs; by inverting the colour-dominance from light to dark areas; and by transferring the creation of 'upeti into the hands of male carvers – although Neich and Pendergrast (ibid.) remark that women have retained artistic direction.

In American Samoa, the polychrome style of Leone village arose on Tutuila around the same time, as both a response to newly available artificial colourants and a genre of tourist art (Pritchard, 1984; Neich and Pendergrast, 1997b: 30-32). Particularly in Western Polynesia, the 20th-century tourist art or handicrafts market has played a vital role in the continuity of barkcloth manufacture – the positive legacy of which can be seen in tapa's enduring production today in Fiji, Samoa, Tonga, 'Uvea and Futuna. Rather than diminishing or diluting its traditional local significance, the marketisation of tapa in Western Polynesia has underpinned its continued social relevance, which has also allowed it to continue functioning in customary ways (Scothorn, 2007: 92). It is this, more than any other factor, which engendered the stark distinction between barkcloth's continued production throughout the 20th century in Western Polynesia, and its discontinuation everywhere else. The transformation of Western Polynesian dress-ways over this period, for example, largely paralleled other parts of Polynesia (see Addo, 2003).

Central Polynesia, 1800-1950 AD

After 1800, stylistic transformations in the red printed decoration of 'ahufara cloaks and tiputa ponchos of the Society Islands constitutes one of the best-documented chronological sequences in the art history of tapa. Before the 1790s, Tahitian decorative printing consisted of simple circular and C-shaped bamboo stem motifs in freeform compositions (Figure 7.5a). In this style, the garment was edged with a red trim 1-2mm wide. Around the 1790s, fern frond printing began to appear on Tahitian garments (Wilson, 1799: 371), possibly influenced by imported Indian chintz fabrics.[13] A developmental progression of complexity occurred in this foliate decoration between 1800 and 1840, wherein earlier printing schemes rarely intruded more than 2cm from the edge (Figure 7.b), and may (or may not) bear central rosettes of trefoil or quatrefoil fern-print (Figure 7.5c). From 1815-1820 onwards, printing became more densely deployed in triangular or diamond-shaped zones, masked-off around the edges. From the mid-1820s through to the abandonment of fern-printing around 1840, such masking crosses these densely printed zones with plain strips, triangles and zigzags of negative space (cf Hooper, 2006: 185).

As these decorative transitions occurred over the early 19th century, Tahitian barkcloth was also diminishing in the intensity of its linear beater marking, its diversity of fabric types, and its overall volume of production. Nonetheless, in the 1850s (the twilight years of tapa's production in Tahiti), we see a range of unusual innovations in tiputa collected during the voyages of HMS *Galatea* and now in Kew's Economic Botany Collection (see Nesbitt, Curtis and Mills, Chapter 17). On these tiputa, fine cotton needlework realises a range of applique additions, representing plaited and flat-woven leaf strip constructions of typically Polynesian character, used here, however, to trim garments or subdivide them into rectilinear panels. We also see European straw-work techniques typical of English corn dollies (Johnson and Coker, 1987). We equally see chrysanthemum-like rosettes, which may come from either tradition, and bi-crescentic garlands with free-hanging teardrop pendants evocative of Neoclassical decoration. Of particular interest in this regard is one such late Tahitian tiputa in the British Museum,[14] fabricated from imported white Hawaiian kapa bearing a fine *'upena pupu* beater mark; a rare proof that (despite its widespread decline) tapa continued to circulate between Eastern Polynesian nations during the 19th century.

By the 1880s, woven trade cloth had entirely replaced barkcloth in the everyday clothing of people from the Cook Islands in the west to Rapa Nui in the east. The 1830s-

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13 Such chintzes are hard to find in artefacts or images of Central Polynesia during this period, although they are prominent in contemporary artefacts from island Melanesia.

14 British Museum Oc 2.1944.683.

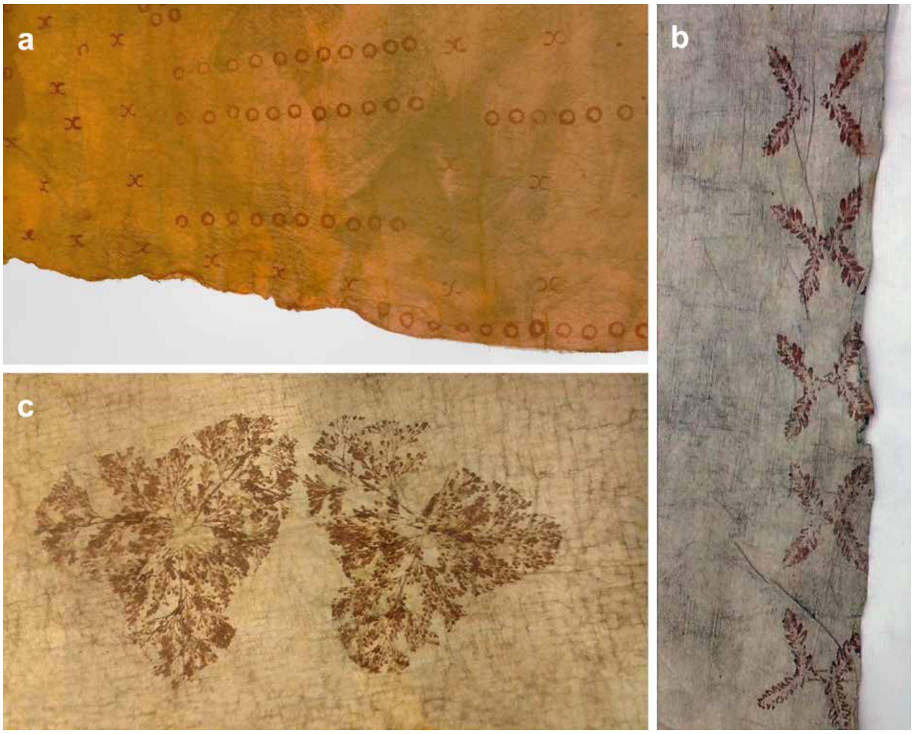

Figure 7.5. a) Tahitian stamp-printing of the 1760s-1780s used only bamboo stem sections (The Hunterian, GLAHM: E.595/1). b) By the 1790s, fern-leaf print edging became popular (University of Aberdeen Museums, ABDUA 4009). c) Around 1810, trefoil and quatrefoil roundels appear, which become infilled triangular or rhomboidal zones, and are then crossed with plain negative-space strips (University of Aberdeen Museums, ABDUA 4005).

1850s missionary introduction of 'Mother Hubbard'-style dresses across Oceania eliminated even woven fabric tiputa from Central Polynesian women's clothing by the early 1900s, although they were still current in the Cook Islands during the 1880s (Wyatt Gill, 1892: 19-20). It was, however, another generation before male garments were entirely westernised, and photographs of the 1910s and 1920s show Cook Islands or Marquesan men wearing hybrid combinations of shorts and tiputa, shirt and pareu, and wearing *maro* of trade cloth for fishing work. This understood, it can also be seen that Cook Islands *ariki* continued to wear traditional tapa clothing for chiefly investitures and the diplomatic reception of British colonial officers well into the early 1900s, reflecting at least some continued production. This is equally evidenced by the appearance, between the 1880s and 1920s, of *eva* masked dance pageants on Mangaia and Rarotonga, involving elaborately decorated *pare eva* masks and complete costumes (Neich and Pendergrast, 1997: 76-81; Küchler, 2003: 105-106); quite plausibly, Neich and Pendergrast suggest such masquerade elements may have been brought back to Mangaia and adapted by London Missionary Society missionaries returning from the Bismarck Archipelago. Such continuing requirements for tapa seemingly gave the art greater longevity in the Cooks than the Society or Marquesas Islands: when Hiroa (1944) conducted anthropological fieldwork in the Cooks during the 1920s, he found women on Mangaia and Aitutaki still making barkcloth, although he remarked that Mangaia's transition to a plantation economy circa 1900 had motivated the digging out of the island's *Broussonetia* gardens, necessitating the exclusive use of *Artocarpus* thereafter. While barkcloth production seems to have ceased altogether on Mangaia and Aitutaki by the mid-20th century, Teiotu (2007) implies that production on Atiu (albeit with a shift to *Ficus* bast species) has been continuous through to the present day.

Hawai'i, 1800-1950 AD

Several of the 'classic' features of kapa came to full fruition during the early 19th century and were either enabled by imported steel carving tools transforming beater and 'ohe kapala stamp forms – or were influenced by the importation of European and South Asian textiles. Kaeppler (1975: 8-9) put it well: '18th-century Hawaiian barkcloth is relatively thick, is often ribbed,[15] and has bold angular designs, while 19th-century barkcloth is thinner, has smaller designs organised differently, occasionally includes circular motifs, and has an elaboration of the watermark which is found only incipiently on 18th-century barkcloth'. Hiroa (1957: 170-179) presented an elaborate classification of Hawaiian beater marks, and observed that both coarse and fine linear beater marks, and regular grid beater marks, appear with increasing frequency over the early 1800s (Figure 7.6a), followed by *'upena* (fishnet) and 'upena pupu (pipped fishnet) beater marks, which became particularly popular from the 1820s onwards (Figure 7.6b). Hiroa (1957: 179) considered the most complex beater marks realised with relief-carved beater faces to be a tertiary phase of development arising during the mid-19th century (Figure 7.6c).

The deployment of different 'ohe kapala stamps after the 1770s indicates a similar trajectory of complexification. By the 1820s collections made on the voyages of HMS *Blonde* and HMS *Blossom*, we see quite a different aesthetic with fine small chevron and asymmetrical stamps intensively deployed in narrow bands of multiple columns, often on dyed cloths otherwise largely plain (Figure 7.6d; Dampier, 1971: 47; Hooper, 2006: 89). Around the 1850s, larger, more complex carved stamps begin to appear, deployed as repeating elements in lines or open polka-dot patterns, which are reminiscent of Indian calicoes (Figure 7.6e).

In the mid-19th century, we also see emergent and hybrid fabric types in Hawai'i. While the shell burnishing of fine kapa to a smooth paper-like texture was practised in the 18th century and before, some 1850s kapa collected on the voyage of HMS *Galatea* are as thin and polished as mechanically milled paper (see Nesbitt, Curtis and Mills, Chapter 17).[16] At the same time, a blending was occurring in fabric production that adapted pre-existing practices of incorporating māmaki (*Pipturus albidus*) fibres, or shredded dyed kapa, into new cloth. We see hybrid kapa types incorporating shredded European fabrics; reduced down to single short threads, or scraps of no more than a few millimetres across, these spun and woven components were beaten into a matrix of kapa to produce pastel-coloured, mottled fabrics.

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15 What other authorities term 'grooving.'

16 It was also during the later 19th century that male *Broussonetia papyrifera* plants of Sino-Japanese stock were introduced to Hawai'i for papermaking, hybridising with local female clones for the first time in 3,000 years (Seelenfreund et al., 2010).


a
b
c
d
e

Nevertheless, it is certain that kapa rapidly disappeared from everyday Hawaiian use, and production, over the 19th century. As early as 1825, the painter Robert Dampier (1971: 43) complained that he could not convince Hawaiian women to sit for portraits in their everyday kapa; every sitter arrived dressed in her best black silk gown of fashionable European cut. By the early 1860s, Rufus Anderson of the American Board of Commissioners for Foreign Mission wrote that Hawaiian women, 'taught in the first instance by ladies of the mission, succeed well in the manufacture of bonnets and hats from the cocoa-nut and palm leaf, or a fine flexible grass; while not a few are able to cut and make garments for themselves and their children. At any rate, many of the females must have learned the art of making clothes, for they are everywhere seen wearing loose but appropriate garments of foreign cloth' (1865: 231-232). These were the *holokū* dresses that Mother Hubbard house dresses became known as when introduced to Hawai'i in the 1820s, which evolved over the late 19th century into that definitive early 20th-century Hawaiian garment, the *mu'umu'u* (Gray, 2014).

Discussion

Three thousand years of Polynesia's occupation have seen a vast plethora of transformations to the art of tapa in the region. Barkcloth of the 12th century BC was a comparatively simple textile art, employing no more than half a dozen plant species for fabric and colourant, generating a handful of simple fabric types at most, and no more than three or four garment forms. By the year 1850, conversely, people dressed distinctively in every place, a dozen species provided fabrics, more than a hundred provided colourants, and the number of named fabric types (certainly more than three hundred) can no longer even be guessed at. Such has been the creative fertility of the Polynesian civilisations in all things. Nevertheless, in closing, we should recognise that the fabric arts – and barkcloth in particular – have always played a special role in Polynesia's cultural history: as instantiators of value and sanctity; as fields of intellectual and artistic virtuosity; as materialisations of what it really means to be from, and of, a place; and as mitigators of the undomesticated world's harshness. Despite all else, these things have not changed in three millennia.

Figure 7.6 (Left). Hawaiian transformations after 1780: a) Linear beater marks became increasingly common, and increasingly fine (Bernice Pauahi Bishop Museum, BPBM 213). b) Fine Hawaiian *kalukalu* fabric bearing an oblique 'upena beater mark (The Hunterian, GLAHM: E.596/5). c) Complex relief-carved beaters developed in the mid-19th century, creating a plethora of new patterns at the end of kapa's production (Bernice Pauahi Bishop Museum, BPBM 194.H.4). d) By the 1825 collections made by the crew of HMS *Blonde*, 'ohe kapala printing stamps had also complexified into a range of chevron and 'tyre-tread' patterns (Bernice Pauahi Bishop Museum, BPBM 2445). e) By the 1850s, large-format stamps had come into vogue for edging and large-scale polka-dot compositions (Bernice Pauahi Bishop Museum, BPBM B.7918).

8

Living with Tapa and the Social Life of Ritual Objects

Adrienne L. Kaeppler

When doing research for my thesis on the Bishop Museum's Melanesian masks for my MA degree at the University of Hawai'i, I was intrigued by a set of masks that derived from the Papuan Gulf, New Guinea. The mask frames were covered with a kind of cloth or textile (Figure 8.1). The accession information for the masks stated that the collector, S.G. McDonnel, who acquired them before 1916 when they came to the Bishop Museum (and before F. E. Williams did his study), noted 'these masks are nearly always burnt after the ceremony known as the *Raiva Ruku*, a totemic dance. The women and children are not allowed to see them, as they are supposed to promptly die if they do, but this seems to be relaxed after the ceremonies. However, when taking them away, I always have to carefully cover them up'. At that time I did not focus on the textile-like material itself, but rather on the social life of these ritual objects (Kaeppler, 1964). Also, as the University of Hawai'i did not have classes on material culture, I did not know how to proceed at that time.

Nevertheless, I kept the cloth in mind and during my first fieldwork in Tonga, still as a student, I was taken under the wing of Queen Sālote, who sent me to important individuals to help me with my research on dance and also introduced me to the concept of *koloa*, valuables made by women, and their ritual importance. I lived with one of Queen Sālote's friends, Halevalu Maile Mata'ele, a descendant of the last Tu'i Tonga and an attendant at the Queen's wedding, and they made sure that I knew about forthcoming ceremonies as well as the fabrication of barkcloth (*ngatu*) and mats so I could use this information in my research and writing. Halevalu who, because of her high rank, could go anywhere at any time, often accompanied me on my ngatu excursions. Also, my closest friends were Lavinia and Atiu Kalaniuvalu, highest-ranking young women of the Tu'i Tonga line. We spent much time together and I accompanied them to the rituals that were still quite prominent in the 1960s (such as the planting of ceremonial yams on sacred grounds) and they shared with me the ledger book of their high-ranking mother, Sisilia Tu'itavake, which had important ritual information about koloa. To these four women I owe my early knowledge about rituals, as well as the intangible knowledge embedded in ngatu.

During my five years of field research in Tonga working on the visual and performing arts, I took part in numerous days of working with women beating paper mulberry,

in: F. Lennard & A. Mills (eds) 2020: *Material Approaches to Polynesian Barkcloth. Cloth, Collections, Communities*, Sidestone Press (Leiden), pp. 133-140.

Figure 8.1. Papuan Gulf mask from the village of Muru (Bernice Pauahi Bishop Museum, B1139).

Figure 8.2. Entrance of Queen Sālote to meet the participants of the meeting of the Pan Pacific and Southeast Asia Women's Association, Tungi Arcade, Nuku'alofa, Tonga, November 1964.

putting it together in finished pieces with dyes and decorations, attending events at which the pieces would be presented, and receiving pieces as gifts. I thus became quite familiar with the manufacture and decoration of the ngatu, as well as the social life of these ritual objects. Some of the women I worked with on this aspect were Nanisi Helu, Huahulu Tupou, Mele Sitani (all of Nuku'alofa), and Fetongi Latukefu of Kanokupolu and Kolovai. In later years I was assisted in my research by Queen Mata'aho (wife of King Tupou IV) and Crown Princess Nanasipau'u Tuku'aho (now Queen, wife of Tupou VI) and her mother Tuputupu Vaea (wife of Vaea, the Noble of Houma). I will summarise some of the memorable occasions and events in which I took part and which featured ngatu.

During my first week in Tonga in 1964, at a meeting of the Pan Pacific and Southeast Asian Women's Association, Queen Sālote greeted us, walking on a huge beautiful piece of barkcloth (Figure 8.2). During this conference there were demonstrations of ngatu making, presentations of large and small pieces to important members of the conference, and fieldtrips to villages where these events were taking place, where I met women who would become important for my future research.

The following year during my residence the Queen became ill and was sent to Aotearoa New Zealand for treatment from which she was not expected to recover. I attended an extraordinary ngatu making event where pieces were being made for presentation at the Queen's expected funeral. This event was on behalf of the Queen's daughter-in-law Princess Melenaite at the village of Lakepa. There were simultaneous *koka'anga* (community making of large pieces of barkcloth) of three huge pieces – one *ngatu tahina* (a huge piece of ngatu with white borders, see Figure 9.1) and one *ngatu 'uli* (special black tapa for high-ranking

Figure 8.3. a) Koka'anga on behalf of Princess Melenaite at the village of Lakepa. The ngatu 'uli in progress was a spectacular piece with a dramatic design. b) The grave area is encircled by women holding a ngatu tahina while the burial is conducted. The metaphorical design is *manulua* (two birds) indicating high genealogical rank on both sides of the family.

ceremonial events), and an even larger traditional *fuatanga*. The ngatu 'uli was a spectacular piece with a dramatic design (Figure 8.3a). During the extended funeral ceremonies these and many other huge pieces were presented and used in their traditional settings, such as encircling the whole grave area with a piece of ngatu (Figure 8.3b). I was also present at two other rituals for this funeral, the *hifo kilikili*, the decoration of the Queen's grave with ritual stones found only on the island of Tofua – these are oiled with scented coconut oil and

Figure 8.4. Ngatu hemahema to be presented at the investiture of ʻUlukalala.

presented with huge mats and barkcloth – and the actual end of mourning ceremony which consisted of a ritual striking of beaters on an anvil led by the deceased Queen's high-ranking granddaughter, Princess Pilolevu. Tapa beating had been prohibited for the year of mourning and this was the signal that the work could begin again.

The investiture of King Tupou IV was held one and a half years later so women could prepare many ngatu for the upcoming ceremonies. The investiture of King Tupou IV's youngest son (now King Tupou VI) to the title of ʻUlukalala, by his village Tuʻanuku in Vavaʻu, featured major presentations of ngatu including a most beautiful ngatu ʻuli, made by his mother-in-law from the village of Houma in Tongatapu and four ngatu tahina in a special Vavaʻu design called *hemahema* made by the women of Tuʻanuku (Figure 8.4).

I also attended the events associated with the 1975 wedding of Princess Pilolevu, daughter of Tupou IV. At the time she was the highest-ranking female in Tonga and her wedding was a major event. The presentations included piles of ngatu, mats, and other ritual objects. Shortly after, the evidence of her virginity and virtue was acknowledged by the exchange of mats and barkcloth between the two families. Other important ceremonies featured barkcloth, such as the funeral of Tupou IV and the coronation of Tupou V in 2006, and the funeral of Tupou V and coronation of Tupou VI in 2012. Barkcloth also played a role at the funeral in 1966 of Vaisima Hopoate, my major music and dance mentor and descendant of Tupou I, and at events associated with ordinary people, such as the 1965 first communion of a young man named Falakiko.

During most of this time I was employed by Bishop Museum in Honolulu, where I had the quite different experience of attempts to reconstruct the Hawaiian method of making and decorating barkcloth, *kapa*, which had essentially lain dormant since the end of the 19th century. Most important here was working with Malia Soloman and Kenneth Emory who were researching all the available documents and Malia experimented each step of the way (Figure 8.5). I curated my first tapa exhibition at Bishop Museum in 1970 (Figure 8.6). Perhaps the first exhibition anywhere entirely about tapa, it was reported in

Figure 8.5. Malia Soloman experimenting with Hawaiian kapa making.

STORY OF TAPA—Dr. Adrienne Kaeppler watches narrated color slides of tapa beating while images of Hawaiian tapa designs are displayed on the ceiling of the museum exhibit room. — Photos by Warren Roll.

Figure 8.6. Adrienne Kaeppler, in her tapa exhibition, Bishop Museum, 1970.

Figure 8.7. Exhibition at the Tongan Cultural Centre for the visit of the South Pacific Forum, 1991.

various Honolulu newspapers, as such an exhibition was unusual even for Honolulu. It included barkcloth from all parts of the Pacific, and was multimedia, including a video of tapa making that I had made in Tonga, and a loop of numerous kapa designs from Hawai‘i.

In 1991, working with Crown Princess Nanasipau‘u, we organised an exhibition at the Tongan Cultural Centre for the visit of the South Pacific Forum. This included huge pieces of Tongan ngatu that were hung from the ceiling of a huge traditional Tongan building, along with other koloa, including the necessary ritual objects for various Tongan ceremonies such as weddings, funerals and baptisms (Figure 8.7). These pieces were lent by several high-ranking women: Queen Mata‘aho (wife of Tupou IV), Crown Princess Nanasipau‘u (now Queen, wife of Tupou VI), and the wives of several nobles.

When I moved to the Smithsonian Institution in 1980, I became curator of an important collection of hundreds of pieces of barkcloth that had essentially never been studied or worked on, including 184 pieces from the United States Exploring Expedition of 1838-1842. Many of the pieces were in bad condition and had never even been unfolded since they arrived in the Smithsonian in 1858. Because of their poor condition and fragility I would not allow visitors to open the pieces, but we conserved some pieces that were exhibited in our *Magnificent Voyagers* exhibition in 1985 (Kaeppler, 1985). Finally in 2010 we received a large three-year grant that enabled us to employ several conservators to stabilise and re-house this collection. And then my interest took another turn, that is, research on the materials from which the barkcloth was made, including the textile plants, the colourants, oils, etc. Along with the head of Anthropology Conservation, Greta Hansen, we hired Michele Austin Dennehy, Natalie Firnhaber (who had previously worked on tapa conservation at the Smithsonian and Bishop Museum) and a paper conservator, Bob Muens. They, along with numerous interns, fellows, volunteers and community scholars and an occasional specialist, such as Anne-Claire de Poulpiquet from Paris, spent all or part of three years on the project. For preliminary results of the project see Kaeppler (2017c).

During the project, I became obsessed with ways to sort out a variety of problems using DNA analysis, fibre analysis, dye and oil analysis, along with specialists in these fields. This research was not always successful, especially with DNA, which presents a variety of problems. Although we found it was possible to separate plant DNA in recently made barkcloth, historic pieces are more difficult. The pieces have been beaten, sometimes fermented, dyed, painted, and changed in other ways, and DNA requires a rather large sample, which is usually not allowed by curators or collection managers. Nathan Wales, of the Danish Centre for GeoGenetics, worked on 16 samples, but most of the barcoding results were not successful. We stopped this research for the time being, but it led to my association as Co-Investigator in the Glasgow project. The DNA analysis proved more successful in Glasgow, but a large barkcloth sample was still required. We also experimented with isotope analysis, which unfortunately has not been successful. Professor Robert Ellam, of the Scottish Universities Environmental Research Centre, after preliminary research and testing, noted 'we can't use the geology to predict the barkcloth', as soil types are not sufficiently differentiated across the Pacific.[1] Even fibre analysis has proved challenging though the addition of FTIR to the Glasgow project has been successful (Smith, Holmes-Smith and Lennard, 2019).

On other tapa fronts, I studied the making of *siapo* in Samoa and *masi* in Fiji, both with paper mulberry, and took part in a tapa making workshop in Mangaia, Cook Islands, using banyan aerial roots. In 2018 Michele Austin Dennehy and I took part in research on tapa making in 'Atiu, Cook Islands and Tahiti, Society Islands, focusing on breadfruit. This latter research was part of the Glasgow project and included collecting plant materials for the Smithsonian Botany department, and was organised with the assistance of Jean Chapman Mason, a community scholar from the Smithsonian project (see Chapter 3).

Along the way, especially during my Cook voyage research, I visited nearly every museum in the world that has barkcloth in their collections, including all the major museums in Europe (and some small, minor ones), Russia, South Africa, Australia, Aotearoa New Zealand, Fiji, and other Pacific Islands. During these trips I learned about the similarities and differences in materials and design among tapa from Pacific Islands, as well as elsewhere in the world. I thank all the curators and collection managers who were often annoyed, as I always wanted to touch the pieces without gloves. Fortunately, they became used to me, as I find it very important to feel the materials in order to try to determine what plant the barkcloth is made from. My years of research in the field and in museums have taught me that cultural tradition is often more important than availability. That is, although more plants could be used both for the inner bark cloth itself and for colourants, and are readily available in natural surroundings, the plants actually used are more likely to be the ones that have been passed on in cultural knowledge and tradition.

It remains to express my gratitude to all my research mentors in the field and the curators, conservators, collections managers, librarians and archivists who helped me over the years. When I carried out most of my research there was no such thing as information on the internet. Fortunately, I was able to travel to museums and archives all over the world and unravel the documentation and identification for myself. Even more important is the firsthand experience of fieldwork and the making of barkcloth and other objects. Although reading about it is important, it does not rival actually taking part in the actual process and the surrounding events. My greatest thanks go to Queen Sālote, who welcomed me as a student to this fieldwork and her successors, down to the present Queen Nanasipau'u. Now after living with tapa for some five decades, and my continuing fieldwork and research, I am looking forward to more answers to many more important questions.

1 Personal communication 19 March 2015.

~ Plant Profile 7: Fibre ~

ʻOloa *Neraudia melastomifolia* Gaudich. URTICACEAE

Mark Nesbitt

Left: Shrub at Kauai Koaei, Hawaiʻi, 2004.
Right: William Hillebrand 172, Moloa, Hawaiʻi, c. 1865 (Kew, K000741542).

ʻOloa is a small tree, to 5 metres tall, growing wild in wet forests in the Hawaiian islands. Several authors refer to the use of its inner bark for barkcloth; for example William Hillebrand referred in 1861 to its ʻformer useʼ (Chapter 17). No pieces of ʻoloa barkcloth have been found in collections and little is known about its properties. Kooijman (1972: 101) suggests it was ʻintended for a special and limited useʼ.

~ Plant Profile 8: Starch (glue) ~

Polynesian arrowroot *Tacca leontopetaloides* (L.) Kuntze DIOSCOREACEAE

Mark Nesbitt

Left: Leaves and flowers at Maui Nui Botanical Garden, Maui, Hawai'i.
Right: Berthold Seemann 908, Fiji, 1860 (Natural History Museum, London, BM001190856).

Polynesian arrowroot grows wild in coastal forests throughout much of the tropics from Africa to Australia; its status in Polynesia is uncertain and it might be one of the canoe plants introduced by the first settlers. The tubers would have been easy to transplant by canoe. It is a member of the yam family growing to 1 metre in height, with deeply lobed leaves. The tubers are rich in starch, but contain poison which was removed by grating the tubers and repeatedly rinsing with water. The starch was also used to glue sheets of barkcloth together, in Tonga, Samoa, the Society Islands and perhaps elsewhere (Chapter 2).

Vernacular names (selected): Niue, Society Islands, Cook Islands, Hawai'i: *pia*; Fiji: *yabia*; Tonga, 'Uvea: *māhoa'a*; Samoa, Tuvalu: *māsoā*.

9

West Polynesian Dyes and Decorations as Cultural Signatures

Adrienne L. Kaeppler

West Polynesia is a well known cultural area with many similar cultural traits across island groups, but also with internal diversity. Both similarity and diversity are apparent in their approaches to making and decorating barkcloth. Except to note the absence of barkcloth among three island groups in West Polynesia – Rotuma, Tokelau, and Tuvalu – in all other West Polynesian areas the manufacture and use of barkcloth was a major cultural form. Starting with overall characteristics, it is made primarily with pasting techniques (although felting was sometimes used), decorations are usually added by rubbing dye over design boards, called *kupesi, ʻupeti* or similar (though there is also freehand decoration). The preferred colours are brown, black, and red (with occasional yellow). Each piece of inner bark, usually paper mulberry (*Broussonetia papyrifera*) – although there have been early reports of the use of breadfruit – is beaten separately (sometimes two are felted to make a more sturdy piece), and then several pieces (or many) are pasted together with a paste made from a plant such as arrowroot. In general, West Polynesian barkcloth is made and controlled by women, and is one of the prime wealth-objects that regenerate people culturally, even though, in some parts of Fiji, for example, it could not be worn by them.

The subject of dyes and decorations has been approached in several publications over the years, especially by Kooijman (1972) who reviewed all of the published and available information for Western Polynesia, including visits to museums with early collections, as well as fieldwork in Fiji. The 2017 book edited by Michael Charleux includes several articles on this subject, especially by indigenous barkcloth makers. Instead of reviewing or summarising this same information here, I will focus on elements of dyes and decorations that can be used as cultural signatures, starting with Tongan barkcloth. I will draw on my personal experiences starting in 1964 when I was brought into the barkcloth system by Queen Sālote (as described in Chapter 8), my visits to almost every museum collection in the world that holds barkcloth, and my belief that Tonga had a great influence on other areas of West Polynesia including their barkcloth (Kaeppler, 1978b). I will also address relevant elements from Samoa, Fiji, Futuna and Niue.

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Figure 9.1. a) Ngatu ʻuli with a red border (background) and ngatu tahina folded in the proper way for a wedding presentation. The ngatu ʻuli is the only one I have seen with a wide red border, made with *ʻumea*, red clay. Exhibition at the Tongan National Centre, 1991. b) Ngatu tahina, with strip of *manulua* design in the centre and *lili* and *losa* (lily and rose) kupesi. In the background women are highlighting the design (*tohi ngatu*). Nukuʻalofa, January 1987.

Tongan ngatu

Important elements of Tongan *ngatu* (Tongan barkcloth) are colour, size, design and use. Designs encode metaphors and allusions, overall colour is associated with social status, and barkcloth presentations help to construct all important Tongan events. Ngatu was, and still is, used for costume and clothing, bed coverings, interior decoration and ritual presentations, especially weddings, funerals, investitures, and for marking important events for chiefs and ordinary people, such as baptisms and birthdays. Large finished pieces, sometimes 5m by 50m or larger, are organised and measured in *langanga,* strips which are about 46cm to 50cm in height (ca. 18 inches). The pieces are categorised by colour and design organisation as ngatu tahina, ngatu ʻuli, and fuatanga*. Ngatu tahina* (white ngatu), is characterised by having white (*i.e.* natural colour) borders and the rest is primarily brown. In *ngatu ʻuli* (black ngatu), the design area is mainly black, with sometimes a red border strip around the design area (Figure 9.1a), and it may have a white or natural coloured border. Ngatu ʻuli are chiefly ngatu deriving their high status from the difficulty of making large amounts of black dye. In both kinds of ngatu, designs are organised to run crosswise (which will be the finished width) between crosswise measuring lines, langanga, and the piece is moved vertically over the design-covered board *(papa).* The designs repeat in every langanga or every second langanga. These lines intersect with a set of long lines that run the entire length of the piece (Figure 9.1b).

The same design structure, layout, and colours have been in use since the 18th century as can be seen in pieces collected during that time, and can often identify the Tongan origin of an incorrectly identified piece of barkcloth in a museum. For example, a large piece of barkcloth in the ethnographic museum in Stockholm has long been identified as Tahitian and associated with Joseph Banks' and Cook's first voyage. However, in Stig Ryden's 1965 book about the collection, the photos on plate xv and description on page 75 indicate that it is not from Tahiti, but from Tonga, and therefore could not have been collected on Cook's first voyage, which did not go there (see Kaeppler, 1978a: 217 and 2002: 295, where this complete piece is correctly identified as Tongan). Similarly, the piece collected in 1793 by Malaspina, in the Museo de América, Madrid, shows the same cultural signature (Figure 9.2). When I first saw this piece in the 1970s, it was dramatically hanging from the ceiling over a huge kava bowl. The colour and design structure of these 18th-century pieces is virtually the same as in later pieces. An example of a piece which has incorrectly been identified as Tongan and collected on Cook's second voyage is in the Nan Kivell collection in the National Library of Australia. However, it is the wrong colour, felted rather than pasted, does not have Tongan motifs, is not organised by langanga, and can easily be identified as Hawaiian.[1]

Fuatanga can be separated from ngatu by the way they are made on the papa. In a traditional fuatanga the piece is moved both horizontally and vertically over the papa and the kupesi designs are repeated in both directions. The width of the finished piece depends on whether it is moved two, three, or more times horizontally, and the length is usually ten or more strips called *toka (*rather than langanga*)* repeated vertically. One section of this size is called *fuatanga tokahongofulu e taha*, *i.e.* one section of ten toka. After first presentation they may be cut into smaller pieces for further presentations

1 See Kaeppler and Fleck (2009: 203); the National Library of Australia believed the piece to be Tongan, but I felt that it was most likely to be Hawaiian.

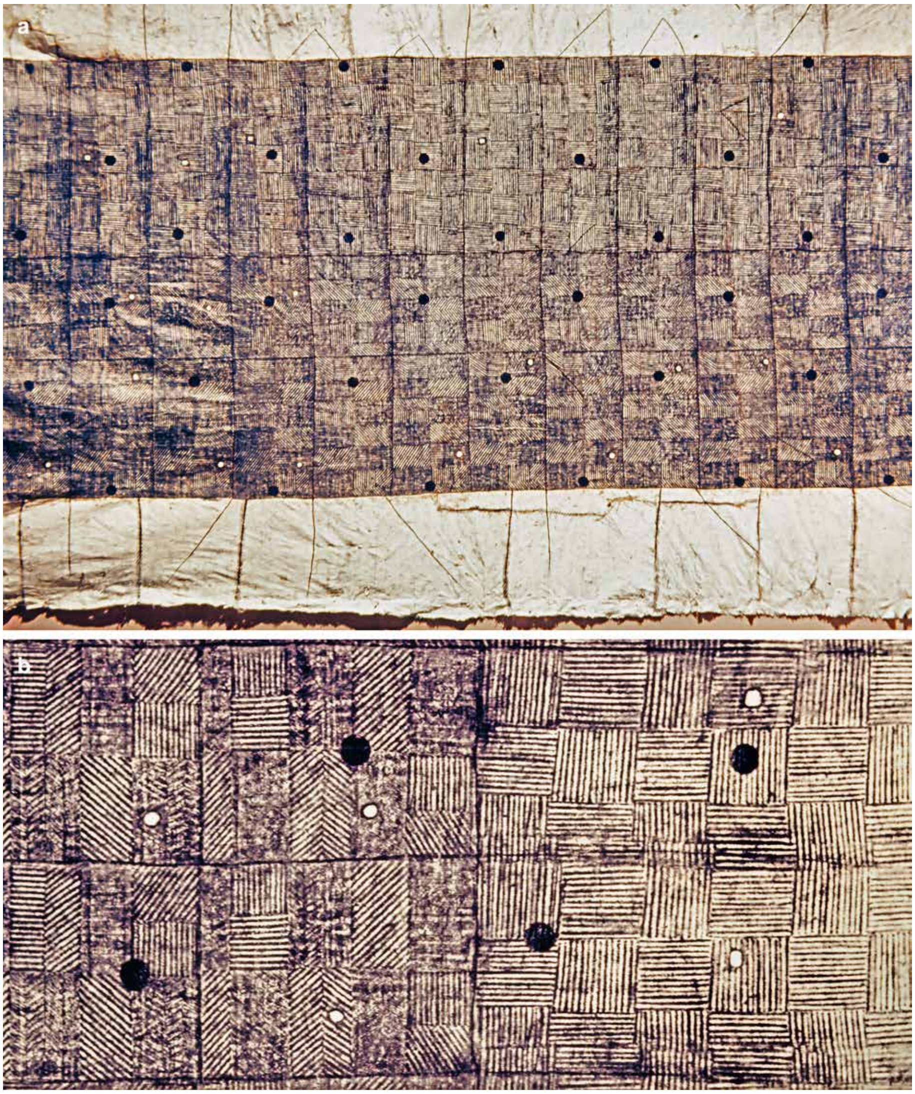

Figure 9.2. a) Ngatu, and b) detail; collected by Malaspina, in the collection of the Museo de América, Madrid. It is one of the very few complete, or almost complete, ngatu from the 18th century.

and are treasured by the recipients (Figure 9.3). They are usually brown, not black, and often have motifs, such as *pangai kafa*, based on a design strung or lashed onto the papa or they may have kupesi appropriate for the first presentation. Fuatanga are more difficult to make and traditionally intended primarily for the use of chiefs. Today the layout has changed, with fewer toka in both directions, and can be made and used by anyone. What makes it a fuatanga is that it has wide (usually white) borders on all four sides. During my more than four years of fieldwork in Tonga, I only witnessed the making of one traditional-sized fuatanga. This was in 1965, and was made for Princess Melenaite by the village of Lakepa to be used for the soon expected funeral of Queen Sālote (see Chapter 8).

Figure 9.3. Small piece of a fuatanga. It was given by Queen Sālote to Nanasi Helu for the wedding *vala to'onga* for her daughter Eunici. The fuatanga was made in honour of Queen Sālote's trip to the Coronation of Elizabeth II in 1953.

To make ngatu, the inner bark of paper mulberry plants (*Broussonetia papyrifera*), called *hiapo*, are beaten separately (producing a rectangular piece called *feta'aki*) by individual women who periodically work together to make the larger pieces. This communal work usually takes place in a special building that contains a large curved design-holding board (papa) three or more metres long, formed into a metre ellipse that is raised about a foot or more (30cm) from the floor. This curved board, which constitutes the support, is covered with elements that will be used to transfer designs to the cloth. The base layer was sometimes a mat, a fishnet, or a design derived from lashing or attaching *kafa* cords or strings made of twisted coconut fibres to the papa. This forms a base for a series of kupesi, and a feta'aki covering is added to hold it all in place ready for the next stages (Figure 9.4a).

A finished ngatu is usually made in two layers, *laulalo* and *lau'olunga* (bottom and top), which will be placed and pasted perpendicularly at right angles so that the fibres run in opposite directions to keep them from pulling apart. The bottom layer is often made by the woman who will own the completed piece, by pasting enough feta'aki together to constitute this layer. The next stage is a community project that usually takes a whole day. The laulalo is brought by the owner, and the members of the group bring feta'aki to make the top layer. The women work together pasting feta'aki to each other and to the bottom layer (traditionally with cooked arrowroot, *māhoa'a*), and adding the colour by dipping barkcloth remnants into the dye and rubbing it over the entire top surface of the two feta'aki layers that now cover the kupesi attached to the papa (Figure 9.4b). Occasionally, only the kupesi is highlighted in brown and the surrounding areas are left uncoloured, called *tapa'i ngatu* (see Figure 8.2). This community stage of work (called *koka'anga*) involves a group of women who work together pasting, rubbing dye over the layers on the papa, moving the cloth onto the laps of the women sitting on one side of the papa (at this

Figure 9.4. a) Papa with a lashed pattern of diamonds made with kafa (coconut fibre sennit), which forms the base for kupesi. Made by Huohulu Tupou of Nuku'alofa, 1966. b) Koka'anga of ngatu tahina at Lakepa Village, October 27, 1965. The participant in the right foreground holds a vegetable tuber used for paste.

stage it is often pushed under the papa), and repeating these steps until they have a huge, long piece – usually 50 langanga, which may be numbered on the border. This length is called *launima.* A hundred langanga piece is called *lautefuhi*. N*gatu lau teau* refers to an even larger presentation piece, barkcloth of an enormous number of langanga, usually between 500 and 1000, which may constitute more than one piece. For example the lau teau that was presented at the investiture of ʻUlukalala in 1991 consisted of 500 langanga – 100 of ngatu ʻuli and 400 of ngatu tahina (of a special design, *hemahema*, associated with ʻUlukalala's village of Tuʻanuku).

After the kokaʻanga the owner of the piece takes it home and lays it out in a grassy place to be subjected to dew overnight and then left to dry. The final stage is done by hand, and consists of highlighting the main parts of the designs that have been rubbed from the kupesi, with dark brown dye using a pandanus-key brush. This stage (tohi ngatu) is done by the owner alone or with the help of a few female friends or relatives (Figure 9.1b). Depending on the skill (or patience) of the person(s) who do this last stage, the finished product may be precise and beautiful or it may be slipshod – an evaluative criterion for a finished piece, along with the straightness of the lines running horizontally and vertically. At the completion of the ngatu, dark brown *hea* dots (*foʻi hea*) may be painted in various places on the ngatu.

The overall design encodes a conceptual framework made up of three elements: 1) straight lines that define the langanga/toka and the layout for 2) the named motif kupesi set which is the essential feature of the whole and 3) the decoration or elaboration of the named motif with additional kupesi, such as flower necklaces (*kahoa*). The kupesi set may be context sensitive depending on to whom the completed barkcloth will be presented and for what occasion, especially the first presentation. After its first presentation the piece is often cut for further presentations, which should always be in four or eight langanga *(folaʻosi* and *fātuua*). It is the space-defining lines and layout that separate the two kinds of barkcloth (ngatu or fuatanga) rather than the design motifs themselves (although some designs are more appropriate for one or the other). An essential feature of the finished cloth is the overall concept that derives from the set of kupesi*,* which convey *heliaki,* a word that means indirectness or hidden meaning by metaphor or allusion. Evaluative criterion include how skillfully the finished piece encodes heliaki, as well as how the individual kupesi contribute to it,[2] how carefully the tohi ngatu is executed, the colour of the dyes and how well they have been prepared.

Designs used during the 18th and 19th centuries were primarily geometric, but during the late 19th century Tongan women began to add naturalistic designs. The earliest pieces with naturalistic designs that I have located are a piece in Peabody Museum, Harvard, which has a geometric/naturalistic design featuring the Haʻamonga monument and cement water-tank designs collected in 1899; a piece in the Australian Museum, Sydney, collected by Reverend Ernest E. Crosby, who served in Tonga from 1884 to 1892; and a piece in the American Museum of Natural History, collected in 1902 or before that features motifs of bats, birds, foliage, wreaths, and vase-like objects (Kaeppler, 2002: 297-301, 304-305; 2005b: 261-263). Of course, long before there were naturalistic designs on late 19th-century ngatu, they appeared on clubs, and can be seen on an extraordinary food hook collected on one of Cook's voyages (Kaeppler, 1978b: 225) and on a piece of ngatu in Florence with human stick figures reminiscent of that food hook (Kaeppler, 2002: 292). The famous *Hala Paini* (Road of Norfolk Pine trees) design goes back to 1920, when Father Gregory Kailao drew the design and it was made into a kupesi by Lopeti Cocker of Folaha. As will be seen below, however, Samoa previously used naturalistic designs and may have influenced Tonga.

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2 Two examples of this can be found in Kaeppler, 2002: 304: ʻ*Fala o Setane*' (mat of Satan) ngatu tahina and Kaeppler 2002: 304: ʻ*Sisi fetuʻu o Latufuipeka' (*Lātūfuipeka's waist garment of stars) ngatu ʻuli.

Figure 9.5. a) Scraping tongo (mangrove) bark in Veitongo village. b) Presentation of ngatu tahina made with tongo (mangrove) dye.

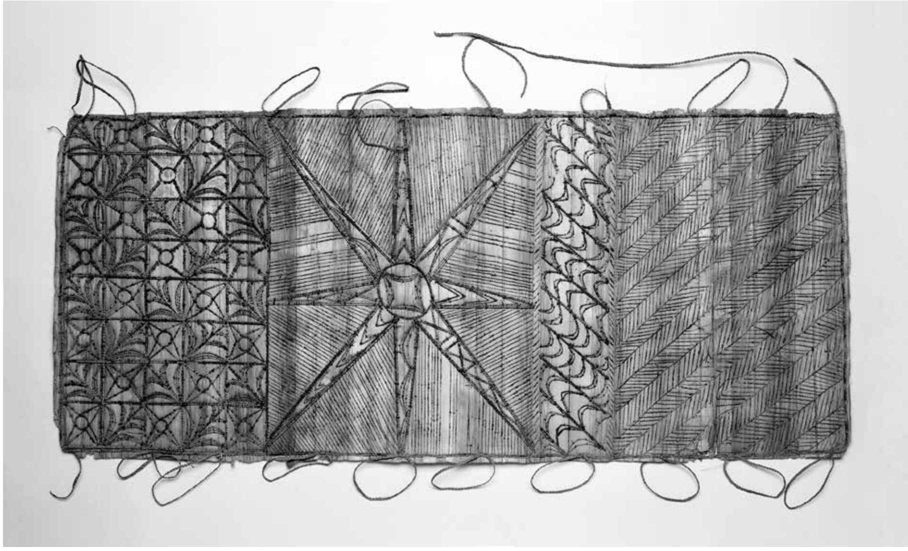

Figure 9.6: Samoan pandanus-leaf ʻupeti. Collected by Colonel Albert B. Steinberger in 1873 (Department of Anthropology, Smithsonian Institution, 13,737).

Moving now to colour, the most desired brown dye is made from the bark of the *koka,* (*Bischofia javanica*), *tuitui* (candlenut) and other trees. The bark is scraped from a living tree with a metal implement, mixed with water, and squeezed with a hibiscus fibre strainer to remove the bark remnants to leave the rich brown liquid. This tree has now become rare and the owners no longer let others scrape their trees (which die if not treated properly). More recently, the outer bark of *tongo* (mangrove) has become more popular (Figure 9.5a). This gives a more orangey colour (Figure 9.5b) quite different from the subtle brown colours that Tongans prefer. Black is usually made by burning candlenuts under a large pot and scraping the oily residue into the scraped bark of koka or other trees. Red has been made traditionally from ʻumea, red clay, found on the island of ʻEua, dried and scraped or grated into koka dye. Today, commercial dyes may also be used.

Samoan siapo

Samoan *siapo* is also made of the inner bark of the paper mulberry plant, but usually produced in relatively small pieces (compared to Tonga) usually a size that could be worn as a wrap-around skirt or kilt. Siapo is decorated in two ways: by rubbing dye over the beaten cloth placed on an *ʻupeti* design board made of pandanus and coconut-leaf midribs (Figure 9.6) or a carved wood panel, and highlighting parts of the rubbed design by overpainting (*siapo tasina*), or by freehand painting (*siapo mamanu).* The famous 20th-century siapo maker Mary Pritchard (1905-1992), who learned her craft in the 1920s, used these same terms. Peter Buck (Te Rangi Hiroa), who researched in Samoa in the 1920s noted two kinds of decoration, *tutus*i or *mamanu* (painting), and *elei*, rubbing (1930: 306). He further notes (1930: 312), that cloth prepared by the rubbing process receives names according to the size and the purpose for which it is meant to be used: siapo, though a general name, also denotes the shorter-sized pieces suitable for use as kilts. The reward given to a talking chief for calling the kava is one or more *siapo potu*, i.e, a sheet larger than a siapo and often used as a small screen. *Pupuni* referred to a large sheet used as a screen to shut off an end of a house. Krämer used a classification by colour, that is, siapo tasina as red siapo and *siapo uli*, black siapo (1955: 355). Pratt (1911) gives terms for large pieces of barkcloth: potu referring to a siapo screen; *tai namu*, a mosquito curtain; *ululima*, a large sheet measuring 50 widths of an ʻupeti tablet; and *uluselau*, a very large sheet measuring 100 widths of an ʻupeti. Today these large sizes are no longer made, and contemporary pieces are primarily art objects made for sale.

In many examples from the 19th and 20th centuries, the designed area was divided into squares, filled with geometric motifs and sometimes based on floral patterns. This designed area was sometimes bordered on two sides by a plain brown strip about the width of the squares or smaller. Motifs include squares and triangles, divided and decorated in various ways with circles or dots, and crescents. Some of these motifs are given names, such as pinwheel (*peʻapeʻa*), flying fox (*peʻa*), jellyfish (*ʻaluʻalu*), and star *(fetū).* Although these motifs have been given names by various Samoans and other authors (Pratt, 1911; Pritchard, 1984; Krämer, 1995 [1902-1903]: 355, 357, 359, 361; Meredith and Fitiao, 2017), it is not known if these names were originally invariable, or if they varied from barkcloth maker to barkcloth maker (as they do now), or if they derived from the beholder.

Colours are usually brown and black from the same sources as in Tonga, especially *ʻoʻa* (*Bischofia javanica*) and *ele*, a red ochre, and occasionally blue or yellow. The blue may be from commercial dye or even such things as carbon paper, but the remains of the yellow dye appear to be turmeric, which in some parts of West Polynesia had a religious ritual significance. Pratt's (1911) definition of potu as 'the siapo screen from behind which an aitu (spirit) spoke' opens the possibility that some siapo pieces had a similar ritual function to their counterparts in Fiji, where a piece of barkcloth hung from the rafters of the godhouse (*bure kalou)* and served as a pathway for the god to descend to the priest.[3]

A piece in the Smithsonian collected in 1873 by Col. Albert B. Steinberger is 333cm in its longest dimension and 262cm in the other dimension, which is cut and therefore we do not know its original size. Thus, according to the notes of Buck (Hiroa) and Pratt, it would be a potu or a pupuni and possibly used as a house divider or a screen. The freehand internal design (of about 145cm) is a series of squares (each about 43cm). This very-difficult-to-see design is a complex of straight rectangular forms, leaflike forms, and elongated triangular forms. However, it is overpainted with a dark brown glaze, probably ʻoʻa, that has almost obliterated the design. Surrounding this design area is a band of plain brown, which is, in turn, surrounded on three sides by a white border, about 250mm wide, on which is painted a double horizontal row of fish, interspersed with an occasional vertical fish or lobster. The whole is made up of two to four layers of white single sheets (see Kaeppler, 2005a). This 1873 piece contrasts with many pieces from the US Exploring Expedition from Samoa (1838-1842), which are mostly of the smaller siapo size and do not have such a complex design. Of further interest is the figurative fish design, which predates Tongan figurative designs and may have been of influence.

3 For further information on Samoan colour and design see Pritchard, 1984; Neich, 1985: 50; Krämer, 1995; Neich and Pendergrast, 1997a: 15; Kooijman, 1972: 237 and Kaeppler, 2005a.

Fiji, 'Uvea, Futuna and Niue

Fijian dyes or paints are similar to those used in Tonga and Samoa except that apparently *Bischofia* was not used.[4] The term *masikesa* refers to barkcloth that has been coloured and designed. Researchers do not agree if kesa is the name of one or more specific plants. Ewins (2014) uses *kesa* to refer to scraped bark or roots of *gadoa (Macaranga harveyana*), as well as dyes and paints made from scraping the bark from *Elaeocarpus pyriformis*, candlenut and mangrove trees, while Kooiijman (1977: 173) just mentions kesa as the scraped roots of gadoa (*Macaranga seemannii*). Others use kesa to refer to scraped bark or roots from a variety of plants. These barks give a reddish-brown colour, all of which may be boiled to intensify it. The reddish-brown colour can be made darker or more black by adding soot from burnt candlenuts or more red by adding red ochre which has been dried and grated. Designs and their names in Fiji are many and often associated with the place where the piece was made, such as Cakaudrove or Lau, where Tongan influence is strong. In addition to rubbing boards (*kupeti*), incised bamboo rollers were used in some areas, usually carved with ridges in straight lines or groupings of lines. Fijians also used stencils, originally made from leaves, but now from X-ray film.

'Uvea (Wallis) and Futuna barkcloths seem to have been influenced by Samoa and Tonga. 'Uvea has long brown pieces similar to both, but not organised in the same way. Futuna, in addition to a pasted variety of long narrow sizes, made special kilts by a felting technique. The kilts are measured in *sala* and have fine geometric patterns, often stepped or stairway designs, painted in black or brown on beige with touches of red. The distinctive geometric designs surround a centre section of black or red and the whole piece sometimes has a black or red border.

Little is known about early Niuean barkcloth, hiapo; most extant pieces are from the second half of the 19th century and were collected by missionaries. Most researchers attribute the historic introduction of barkcloth to Samoan missionaries, who taught Niueans the Samoan method of making barkcloth and brought the poncho (*tiputa)*, previously introduced to Samoa from Tahiti. However, it is equally likely that the Niueans traditionally made and used barkcloth, as designs from the earliest known pieces are similar to those on Tongan barkcloth. A distinctive characteristic of Niuean hiapo motifs is a spiral motif that radiates in four or eight crescentic curves from the centre of a square – essentially curving the four or eight straight lines characteristic of Samoan and Tongan motifs which are formed from crossing a square diagonally and/or vertically and horizontally (see Chapter 18, Figure 18.4). Other motifs are concentric circles, concentric squares, and squares divided into eight triangles, some or all of which are filled with crescents that diminish in size. And most importantly, Niue seems to have been a leader in introducing naturalistic motifs that depict human figures (Kaeppler, 2008: 101,102), in a square or rectangle surrounded by geometric motifs. A piece of hiapo with a human figure in the British Museum is dated 1887 by a printed date on the cloth – a very early date for the incorporation of naturalistic designs in West Polynesia. It appears that although Niuean designs may have been imported or influenced by Tonga and Samoa, these design concepts were transformed by Niueans and in turn influenced the design systems of Tonga and Samoa.

4 Ewins, personal communication.

10

'A Classification of Tongan Ngatu': Change and Stability in Tongan Barkcloth Forms since 1963

Billie Lythberg

In 1963, Māori schoolteacher and student of anthropology Maxine Tamahori submitted a Master of Arts thesis to The University of Auckland based on eight years' residence and a year's formal fieldwork in Tonga. Her remarkable study, *Cultural Change in Tongan Barkcloth Manufacture,* has informed the work of scholars, curators and artists ever since, despite access constraints imposed by its availability only as a photocopied volume at The University of Auckland library. In 2017, to increase accessibility, Phyllis Herda and I produced an e-book of the thesis, which also reproduces Tamahori's original black-and-white and colour photos, fine hand-drawings, and schematic tables in the highest possible resolution (Herda and Lythberg, 2017). In this chapter I utilise Tamahori's diagram 'A classification of Tongan ngatu' and her illustrations of manufacturing techniques as a lens through which to focus a brief assessment of change and stability in Tongan barkcloth forms since 1963.

Tamahori's classification diagram (see Figure 10.1) represents a Tongan taxonomy of the varieties of barkcloth being made in the 1950s and early 1960s. Her primary sorting criterion distinguishes *ngatu 'uli* and *ngatu tāhina* – 'black' and 'white' barkcloths – according to pigment and functional usage. Next, she distinguishes between barkcloths made by the discrete methods of manufacture called *fuatanga* and *hangatonu* (see Figures 10.2, 10.3 and 10.4). These remain the primary criteria by which contemporary Tongan barkcloths are sorted and named.

When Tamahori was writing, all ngatu 'uli were made only by the hangatonu method, but ngatu tāhina were made by both methods and classified accordingly. Within the resulting three categories of ngatu 'uli, *ngatu tāhina fuatanga*, and *ngatu tāhina hangatonu* she names 'known types' and applies an overarching categorisation separating *ngatu 'eiki* or chiefly barkcloths from 'ordinary' *ngatu hingoa* (named barkcloths).

Thus, on a single page, Tamahori presents every type of barkcloth then being made in Tonga, classified according to its mode of manufacture and its materiality, its aesthetic qualities and intended function; each ngatu type having associations with people of *'eiki*

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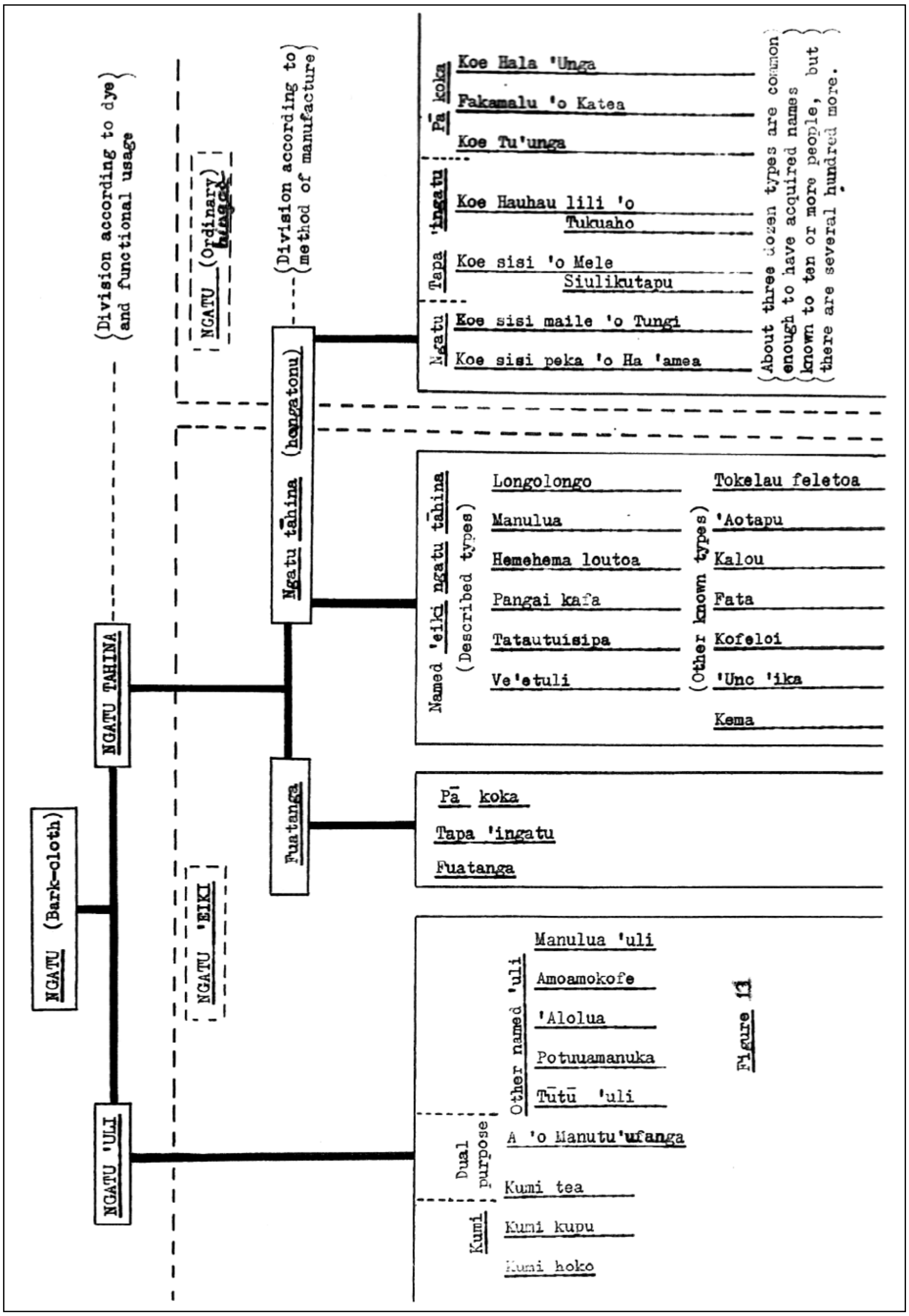

Figure 10.1. A classification of Tongan ngatu (Tongan decorated barkcloth) by Maxine Tamahori (1963: 155, Figure 11 [Herda and Lythberg 2017: 110]).

(chiefly) or *tu'a* (common) class, as well as social occasions and cultural usages similarly viewed as chiefly or common. She describes these categories as well known and fixed, and innovation within and between them as discouraged, except for the making of *kupesi hingoa* – named sets of pattern rubbing boards used to decorate ngatu hingoa. To support this assertion, Tamahori (1963: 164-165 [Herda and Lythberg, 2017: 113-115]) describes a ngatu ʻuli made in about 1960 that innovated a motif in its conventionally only partially decorated or undecorated border (known as *tapa*), and suggests that ʻunless her standing among ngatu experts was not altogether unassailable, [the maker] could expect some caustic criticism when and if her ngatu ever came before the traditionalistsʼ.[1]

Tamahoriʼs diagram offers a generative model for the consideration of contemporary Tongan barkcloth styles and their confounding of former – apparently fixed – classifications through innovations in their materiality, construction methods and aesthetics, as well as shifts both in Tonga and its diaspora. Herein, I engage primarily with her categorisation of chiefly barkcloths and ʻordinaryʼ ngatu hingoa through a brief elucidation of the chiefly fuatanga and ngatu ʻuli and their contemporary materialisations, and the elevation of ngatu hingoa through allusion to the Tongan monarchy.

Making Tongan barkcloths – the fuatanga and hangatonu methods

Tongan barkcloths are made, primarily, from the fibre of the phloem of the *Broussonetia papyrifera*, beaten into pliable strips of cloth called *fetaʻaki*. Fetaʻaki lengths are pasted together end-on-end, then assembled into a double-layered cloth by women arranged along the sides of a low, often convex *papa kokaʻanga* work table. The strips comprising the upper layer are pasted at right angles to those on the substrate, adding strength to the finished cloth. The *kokaʻanga* working session is named for the most commonly used plant-based barkcloth dye, *koka* (made from the shaved bark of the red cedar, *Bischofia javanica*).

The papa kokaʻanga itself is divided neatly down its length into two sections known as *langanga*, each containing an assemblage of *kupesi* (pattern rubbing boards). The makers place a substrate layer of fetaʻaki sheets along the length of the papa kokaʻanga and a top layer across its width, then paste these together before rubbing the upper surface with dye to reveal the design of the kupesi templates beneath. After each pair of langanga has been made it is carefully lifted off one side of the papa kokaʻanga and into the laps of the women sitting there. The process repeats until the desired length has been achieved. This is the hangatonu or ʻstraight-forwardʼ method for making Tongan barkcloth; the most common manufacturing method in use today and historically. Though in theory the hangatonu method may be used to make a barkcloth of any length, its width will never exceed the length of the papa kokaʻanga it was made on.

Three basic differences distinguish the less common fuatanga method from the hangatonu (see Figure 10.2). First, the maximum width of a barkcloth made by the hangatonu method is determined by the length of the papa kokaʻanga, because it is made by adding to its length at right angles to the length of the work table. In contrast, a fuatanga cloth is made in this way until the desired width of the final piece has been reached, then this completed section is shifted off the end of the worktable and further sections, of the same width, are made alongside it and simultaneously joined to it.

Second, each completed section of a ngatu hangatonu is counted as two langanga, and the plain outer border of the barkcloth is numbered accordingly and consecutively (often from 1-50; 50 langanga comprising a commonly made ngatu known as a *launima*, about

1 In Tonga, the term tapa refers specifically to the plain border of otherwise decorated barkcloths, though it has also been adopted as a generic term for all barkcloths.

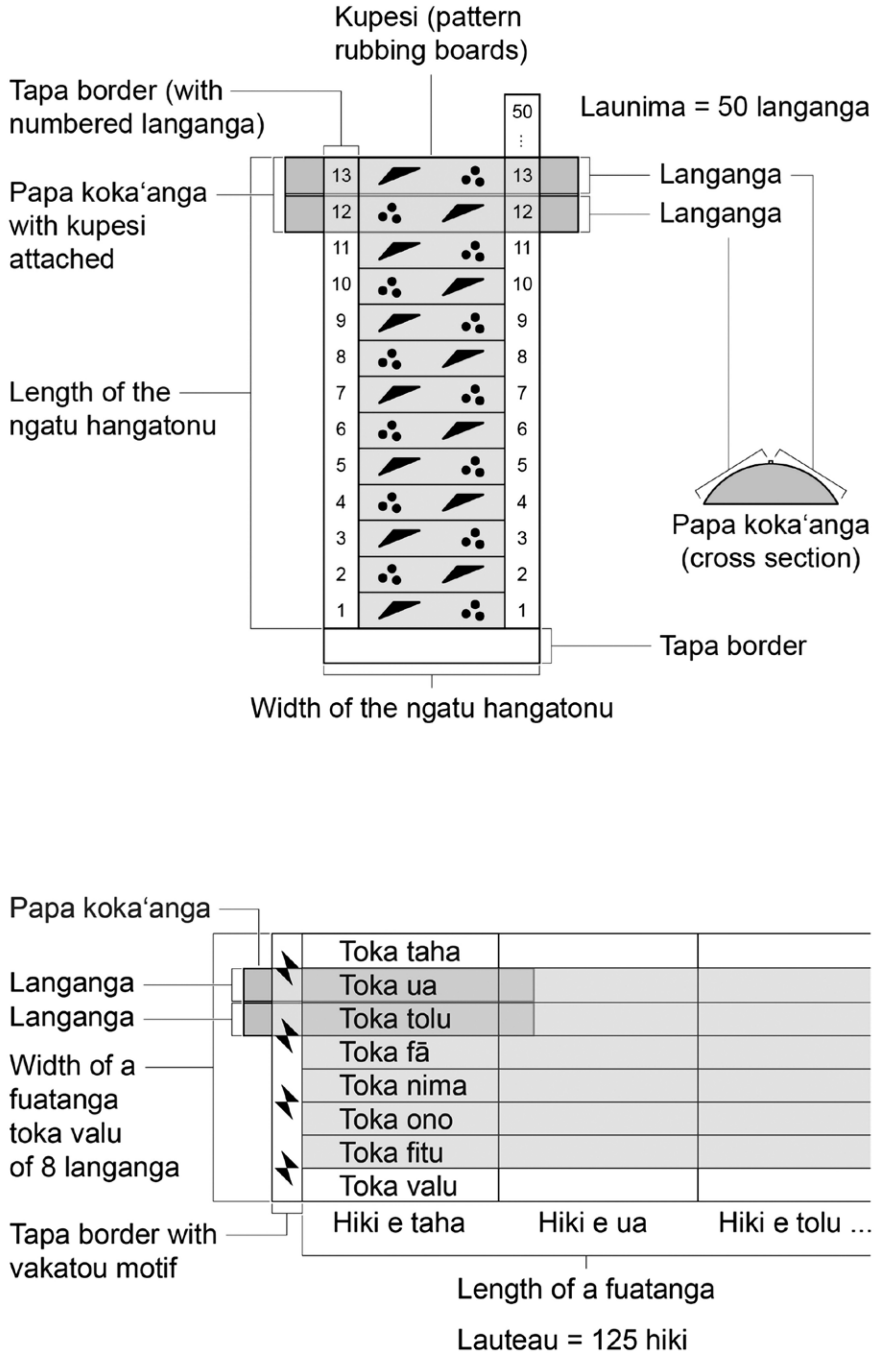

Figure 10.2. Diagram to show differences between fuatanga and ordinary (hangatonu) ngatu. After Tamahori (1963: 195 [Herda and Lythberg 2017: 137]); Kooijman (1972: 316-317) and Veys (2017: 91).

25m long) before the section is shifted off the work table. In contrast, a fuatanga usually counts eight hangatonu langanga, each referred to as a *toka*, as one standard fuatanga langanga (Tamahori 1963: 193 [Herda and Lythberg, 2017: 136]). This measurement is called *fuatanga toka valu* to specify the eight (valu) toka it contains (toka taha = one toka; toka ua = two toka, and so on), consisting of six decorated langanga/toka and two plain tapa borders. Unlike ngatu hangatonu, where every langanga is numbered, the sections of a fuatanga are not denominated in its borders. Instead, fuatanga borders contain distinctive motifs including the angled *vakatou* or *fakatoukatea* (outrigger canoe) that is a *heliaki* or allusion to the linking and intermingling of two families through marriage, and tall triangular motifs extending from the coloured centre of the fuatanga whose top points are each capped with a pair of spiral curls, called *mui moa* or ‘chickens’ tails’.[2]

Fuatanga sections may be larger than the standard fuatanga toku valu measurement, resulting in a very wide barkcloth. Each such section, regardless of how many toka it contains, is called a *hiki* (Veys, 2017: 90-91). During the 1980s, Tupou Posesi Fanua (undated manuscript: 16) recorded that:

> My Grandmother made a <u>fuatanga</u> tapa in which each <u>fuatanga</u> section was <u>toka taha nima</u>, *i.e.* 15 <u>langanga</u> each. It was the largest <u>fuatanga</u> I have ever seen. It was called a <u>fuatanga toho</u> and comprised about 20 <u>fuatanga</u> sections. When it was laid out on the football field beside Tonga High School, it stretched from goalpost to goalpost.

Fuatanga can also be exceptionally long. Tamahori described the making of four 125-section long fuatanga called *lauteau*, made respectively by the women of Fua‘amotu, Tatakamotonga, Lapaha and Holonga for a joint royal wedding in 1947 (1963: 195 [Herda and Lythberg, 2017: 139]).[3]

Third, during both construction methods, the way the substrate (*laulalo*) and upper (*lau‘olunga*) feta‘aki strips are placed on the papa koka‘anga is the same, but the way they lie in the finished barkcloth is different (see Figures 10.3 and 10.4):[4] ‘With the hangatonu the under sheets run from side to side forming the width of the ngatu, and the upper sheets lie parallel to the length. With the fuatanga, the under sheets lie parallel to the length of the ngatu and the uppersheets [sic] run from side to side to form the width’ (Tamahori 1963: 193 [Herda and Lythberg, 2017: 136]).

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2 During the author’s fieldwork in Tonga in 2004, the mui moa were explained as a heliaki for female generativity: women called them ‘chicken tummies’ rather than tails as they gestured to their pubic areas with coy giggles.

3 Fatafehi (later known by the noble title Prince Tu‘ipelehake) married Melenaite Tupoumoheofo Veikune; and the Crown Prince (who came to the throne in 1965 as King Tāufa‘āhau Tupou IV, but in 1947 was still called Tupouto‘a Tungī) married Halaevalu Mata‘aho ‘Ahome‘e. Tamahori estimated the combined length of these *fuatanga lauteau* at over a mile (1963: 195 [Herda and Lythberg, 2017: 139]).

4 In Figure 10.4, Tamahori’s handwritten text reads:
Sketch one: 1st side: Under sheets in normal manner.
Sketch 2: Upper sheets pasted over them; 1st side; Undyed side border left.
Sketch 3: 2nd side: Unused ends of upper sheets.
Sketch 4: 1st side; First two sections completed and rolled up.
Sketch 5: Edge of new undersheet; edge of 1st pair undersheet; upper sheets turned back while lower ones added.
Sketch 6: 5th pair of under sheets; This end joined to end of 1st pair of under sheets; Eight completed sections pulled off end.

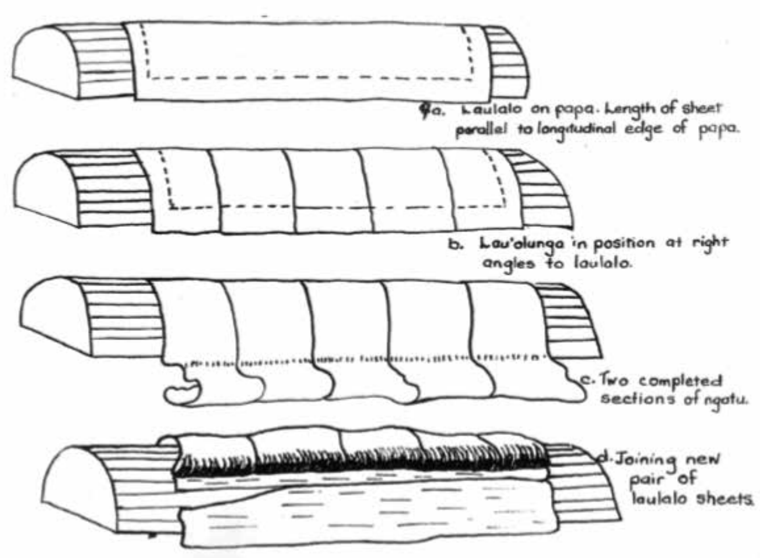

Figure 9: The normal (*hangatonu*) method of assembling ngatu by placing the Upper and Lower sheets at right angles to each other on the half cylinder
a. The Lower or *laulalo* sheets on the cylinder with their length parallel to that of the cylinder
b. The Upper or *Lau`olunga* sheets in position at right angles to the Under sheets.
c. Two completed sections or *langanga*
d. Joining new pair of Under sheets to assembled sections.

Figure 10.3. Method of placing under and upper sheets on half cylinder in the manufacture of hangatonu. Maxine Tamahori Figure 9 (1963: 91 [Herda and Lythberg 2017: 80]).

Tamahori identified three types of barkcloth made by the fuatanga method, all of them ngatu tāhina: *pā koka, tapa'ingatu* and a third subset known simply as fuatanga. She described all of these as 'highly valued' and explained that each was considered to be of the fuatanga category 'because of the method of its manufacture, not because of the design employed or the use to which it was put' (1963: 191 [Herda and Lythberg, 2017: 132]). The fuatanga subset of the fuatanga category will not be discussed further here, and therefore the reader should understand that all subsequent references to fuatanga in the remainder of this chapter relate to the overarching designation encompassing all three sub-types.

The historical designation of fuatanga, which relied solely upon the method of its manufacture, has been superseded by aesthetic criteria in the 70 years since Tamahori was conducting her research, with the most marked changes occurring since the 1980s. In the past, as already described, due to their manufacturing method, fuatanga were often made at an enormous scale, but the fuatanga descriptor is now more commonly associated with a modestly sized and usually square-shaped barkcloth, often made by the hangatonu method, with distinctive wide white borders containing recognised fuatanga motifs. Heather Young Leslie (1999: 197-198) described the 'typical' fuatanga made on Kauvai in the mid-1990s as 'a special sort of barkcloth, heavier, more ornate, and with a pattern designed to be exactly 10 sections square' – forerunners perhaps to the style now popular. In addition, though historically only ngatu tāhina (white ngatu) were made using the fuatanga method, since the 1980s the designation has become more closely associated with the making and form of ngatu 'uli.

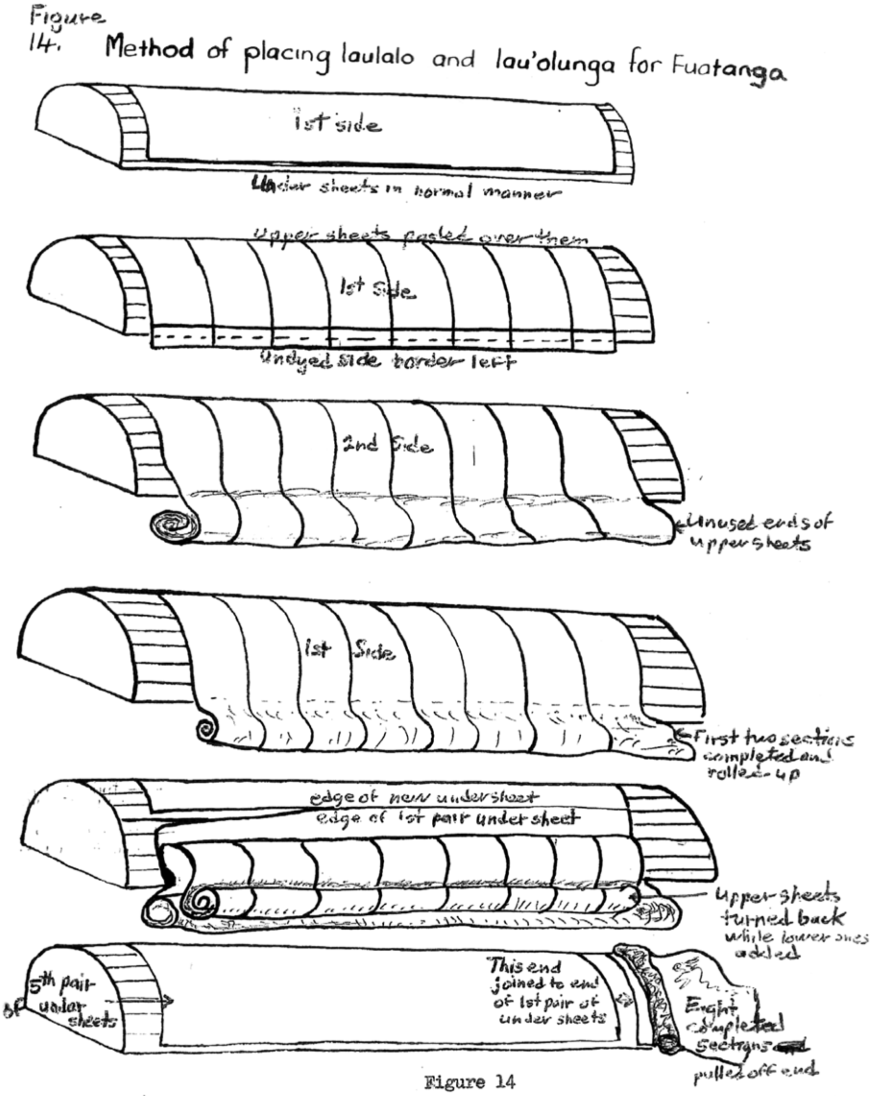

Figure 10.4. Method of placing under and upper sheets on half cylinder in the manufacture of fuatanga. Maxine Tamahori Figure 14 (1963: 196 [Herda and Lythberg 2017: 138]).

Descriptions of the fuatanga method are absent from many publications, with the hangatonu method being treated as normative. Where it has been described in the literature written since Tamahori's study, there has been some disagreement concerning the orientation of substrate and upper feta'aki strips during the making of fuatanga and in the resulting fuatanga itself (*e.g.* Kooijman, 1972: 316-317). This may stem from research based on examples of fuatanga rather than observation of their manufacture; *i.e.* it may be difficult to distinguish the top and bottom from the sides of a square fuatanga, for example, in order to then discern how the barkcloth layers were put together. It is also possible that some makers may have sought to retain the orientation of fuatanga layers even within a barkcloth made using the hangatonu method. This could only be achieved if the substrate strips were placed across the papa koka'anga and the upper layers placed along its length (cf. Lythberg, 2013a: 92). Finally, it may reflect simple confusion.

Ngatu ʻuli – black barkcloths

Tamahori identified nine named types of ngatu ʻuli, all made by the ngatu hangatonu method, which she grouped into three categories (Tamahori, 1963: 157-177 [Herda and Lythberg, 2017: 111-123]). The first three, under the heading '*kumi*', were, 'made in the first instance for ceremonial presentation at weddings, after which they may fill the same role at later weddings or go out of circulation as funerary wrappings' (Tamahori 1963: 160 [Herda and Lythberg, 2017: 112]). *Kumi hoko*, a gift from the groom to his bride, usually had an array of regularly sized rectangular strips extending like a wide fringe along one of its borders, which materially represented the meaning of its name 'seeking to be joined'. *Kumi kupu*, a gift from the bride to her groom, means 'seeking a member or part' (Tamahori, 1963: 161 [Herda and Lythberg, 2017: 112]). The third, *kumi tea* (meaning 'white' black barkcloth), overlapped into Tamahori's second ngatu ʻuli category to join a type introduced in the late 1950s called *a ʻo Manutuʻufanga*: both were described as dual-purpose ngatu ʻuli that also could be used as ngatu tāhina when required. Tamahori's final category included five other named types of ngatu ʻuli used for wedding and funeral purposes, but without the dual-purpose or specific wedding applications of those previously mentioned.

The nine varieties of ngatu ʻuli so clearly identified by Tamahori have not necessarily remained discrete, nor are they all still made. Ngatu ʻuli has instead become a generic term for all black barkcloths, including ngatu tāhina 'upcycled' through overpainting (Lythberg, 2013a: 95-97). However, ngatu ʻuli were, and still are, primarily distinguished by their exceptional black pigment and often presented at weddings and funerals. When Tamahori was writing, all ngatu ʻuli were adorned with and distinguished by *tuitui* pigment, the most labour intensive and time-consuming dye to produce in the Tongan repertoire. The production process has not altered since Tamahori documented it (1963, 64-69 [Herda and Lythberg, 2017: 65-68]), though alternative black dyes made with a plant base (described below) or sourced from commercial suppliers have entered the contemporary barkcloth maker's practice.

Tuitui soot is prepared in a small house or shed constructed or reserved for this purpose, by women who work throughout the night. Quantities of tuitui nuts (candlenut, *Aleurites moluccana*) are boiled, cracked open, and their soft kernels threaded onto the firm midribs (pinnules) of coconut leaflets. These skewers are burned on a fire over which an iron pot is suspended. The pot is characterised as an old lady (*finemotuʻa*), and the rituals associated with it revere Hina, the Tongan deity of barkcloth making. First, the inside of the pot is cleansed with the cut root of a banana plant, and the outside is coated with coconut oil. Next, food is placed in the pot. Tuitui soot makers stress the importance of making the correct food offering to Hina; many use crabs. The attention paid to the way these 'cook' seems to ensure that the pot reaches the correct temperature to accumulate soot. When the crabs pop open in the heat, the coconut pinnules of tuitui are placed on the fire and burned. As they burn, the women chant to Hina, asking for her blessing. An accumulation of soot, hanging like hair from the pot, rewards these efforts. This is either sprinkled over the surface of a ngatu – sometimes over the top of an application of red *umea* clay (Lythberg and Herda, 2016: 136) – adhering by virtue of a light oiling, or is suspended in a solution made from one of the liquid plant-based dyes. 200kg of tuitui nuts yield enough soot to make one launima (a ngatu 50 langanga long) (Fanua, 1986: 14).

As an alternative to tuitui soot, rusty tins are now left to soak in a container of koka or *tongo* (native mangrove, *Rhizophora mangle*) bark dyes, or tongo dye is boiled with caustic soda. However, these alternative blackish dyes fade to a reddish-brown after a few weeks, whereas ngatu ‘uli made with tuitui remain black indefinitely. More recently, black synthetic paint was used by makers in Auckland to prepare a ngatu ‘uli on commission for the Queensland Art Gallery (Māhina-Tuai, 2015).

In Tonga and the diaspora the distinction between chiefly and ordinary barkcloths has blurred, and both ngatu ‘uli and fuatanga are now made by and for commoners, and are also made with synthetic fabrics (Addo, 2013; Lythberg, 2013a; Māhina-Tuai, 2015; Lythberg and Herda, 2016). Indeed, the substitution of non-woven spun-bonded cloth, such as Vilene, for one or both layers of a barkcloth is a significant innovation that materialises the desire to continue to make, present and exchange Tongan barkcloths even when plant-based resources are difficult or prohibitively expensive to obtain.

Ngatu tāhina and ngatu hingoa

Ngatu tāhina are generally made with tongo and koka, but commercially made dyes have had some application in ngatu making since the 1950s (Herda, 1999; Herda and Lythberg, 2017: 159-161). Ngatu tāhina literally means ‘white barkcloth’ but is actually predominantly brown, though it might pale in comparison with the heavily pigmented black surface of a ngatu ‘uli. This is especially true of the chiefly variety of ngatu tāhina Tamahori called tapa‘ingatu, which does not appear to have been made since the 1960s (Herda, 1999: 151). For this style, the brown dye was used only on the raised designs of the kupesi leaving the background of the ngatu unstained (Tamahori, 1963: 189-191 [Herda and Lythberg, 2017: 130-132]).

Ngatu hingoa (ngatu embellished with named sets of motifs) are now the most common of Tongan barkcloths, used for presentations by and to *hou‘eiki* (high chiefly people) and commoners alike. As Tamahori noted (1963: 179 [Herda and Lythberg, 2017: 124]), ‘any attempt to cover all of these would be fruitless as a list of those already in use is almost inexhaustible and is constantly being expanded by the addition of new compositions’. Instead, we can identify two main themes within their named motifs: 1) the recording and dissemination of historical events and foreign concepts; and 2) allusions to the nobility and royal family of Tonga.

The visibility of Halley’s comet in 1910 (Neich and Pendergrast, 1997a: 44); Tonga’s purchase of a fighter jet towards the efforts of the Allied Forces during World War II (Kaeppler, 1998); the first seaplane to visit Tonga;[5] the visit to Tonga of Queen Elizabeth II in 1953 (Lythberg, 2013a: 88-91); the significance of Tonga’s first public buildings, such as churches and concrete water towers (Kaeppler, 2002: 298-299); the appearance in Tonga of European technologies such as gramophones, bicycles and guitars (Kaeppler, 2002: 306); and icons from the Tongan diaspora such as the Sydney Harbour Bridge – all are encoded on ngatu hingoa that serve initially to introduce new events or concepts and thereafter to commemorate them. Their incorporation as images into the products of Tongan soil (beaten bark and earth- and plant-based dyes) allows the formerly foreign to become Tongan. Some kupesi hingoa (named motifs) encode Tongan versions of the names for these events and objects – such as ‘*koe kalamafoni*’ (this is a gramophone) – making them part of the Tongan language.

5 Inscribed ‘*ko e vakabuna*’ (this is an airplane). Canterbury Museum (NZ) Catalogue number E172.130. Viewed by the author 26 June 2003 with Roger Fyfe and Adrienne Kaeppler. This ngatu is part of the Rugby Pratt collection, collected by him in 1922. The provenance held by the Canterbury Museum describes the ngatu as celebrating the 100th anniversary landing of Reverend Walter Lawry in Mua, Tongatapu, and depicting double and outrigger canoes.

However, the most prevalent function of the kupesi hingoa in use today is to allude to the noble and royal families of Tonga and their villages. Examples include the flying foxes of Hihifo and Kolovai (Kaeppler, 2002: 300; Lythberg, 2013b), and the *mapa* fruit (*Diospyros lateriflora,* now *D. major*) associated with the village of Pelehake (Lythberg and Herda, 2016: 137). Often, these also incorporate descriptions such as '*koe sisi o* ______' (this is the girdle of_______) to allude to specific people and their chiefly regalia. When kupesi such as these are used it does not necessarily mean that the ngatu is being made for the person to whom the kupesi hingoa refers; rather, it acknowledges their continued importance in Tongan society and associates the ngatu with their status.

The kupesi hingoa set known as *Hala Paini* is a metonym for the Kingdom of Tonga, and perhaps the best known of all contemporary ngatu hingoa. It combines the pine trees that line the road to the royal palace in Nuku'alofa (hala paini translates as pine road) with the Tongan *sila* or seal. Accompanying the sila, a lion and eagle – symbols of monarchy, power and religious conviction – allude to the Tongan monarch and state.[6] Though these have become the most commonly used and seen kupesi they simultaneously elevate the status of the cloths they embellish – the barkcloths described by Tamahori as ngatu hingoa (ordinary).

Concluding remarks

When Maxine Tamahori produced her landmark thesis, Tongan barkcloth forms were classified primarily according to their pigments and functional use, and thereafter according to their method of manufacture and their chiefly or 'ordinary' status. However, contemporary ngatu demonstrate flexibility in the way these classifications are now made and in the social spheres in which ngatu may be mobilised. For example, when fuatanga-styled cloths are made in a koka'anga hangatonu, these barkcloths are now designated fuatanga because of how they look and how they might be used, rather than how they have been made.

Some of the forms that Tamahori's informants identified are no longer made; others are no longer discrete types in Tonga. However, their former value or application remains known. For example, a ngatu 'uli might be designated a kumi hoko because it is gifted at a wedding to help to join a couple together, even though it lacks the tagged border that formerly defined it. There is thus an interesting indexing of the historical ngatu taxonomy by contemporary ngatu that keeps the knowledge of these older 'eiki categories of ngatu in circulation, even when they are no longer made or mobilised in quite the same way.

Contemporary barkcloths made in Tonga and the Tongan diaspora exemplify a shift in the Tongan polity that began with the Constitution of Tonga enacted in 1875, which – among other things – emancipated common women from servitude to chiefly women, including making ngatu at their behest and with kupesi of their design. During Tamahori's research, this was exemplified by the proliferation of kupesi hingoa being made by common women for non-chiefly barkcloths. Today it finds expression through innovations in materiality and aesthetics that facilitate the making of fuatanga and ngatu 'uli for use beyond the Tongan hou'eiki class, and elevate 'ordinary' ngatu hingoa such as Hala Paini to the status of the iconic.

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6 Adrienne Kaepler has associated the lion with European representations of monarchy, specifically alluding to King Tupou I, and the eagle with America (Kaeppler, 2002: 305). Conversely, Andy Mills suggests they are more likely to represent the evangelist Saints Mark and John respectively (personal communication, September 2018).

11

White for Purity, Brown for Beautiful Like Us and Black Because it is Awesome

Fanny Wonu Veys

Lady Tuna Fielakepa spoke the title of this paper 'White for purity, brown for beautiful like us and black because it is awesome' in November 2014 on the occasion of the *Tapa Festival* conference in Tahiti. Her statement describes the colours, white, brown and black, used on contemporary Tongan barkcloth (*ngatu*), but also gives an insight into the cultural values ascribed to these colours (Figure 11.1). The quote incited me to think about past and present barkcloth colours. I will start by reviewing the historical evidence to move beyond this three-hue framework and explore some of the symbolic and aesthetic meanings of colours.

Figure 11.1. Girls from Queen Sālote College line the barkcloth pathway leading to the pure white royal tombs. The blue of the uniforms mirrors the sky colour and complements the mainly brown hue of the barkcloth. Mala'e Kula, Nuku'alofa, Tonga, 2012.

in: F. Lennard & A. Mills (eds) 2020: *Material Approaches to Polynesian Barkcloth. Cloth, Collections, Communities*, Sidestone Press (Leiden), pp. 167-175.

Barkcloth colours

While most 18th-century to contemporary Tongan barkcloth makes use of white, brown, or black, a few historical pieces and written accounts include red, yellow and purple in the colour palette. In 1616 the Dutchmen Jacob Le Maire and Willem Corneliszoon Schouten were the first Westerners to visit Tonga. In his journal, Schouten (1945 [1618]: 179-180) described a dress that is most likely a loincloth (*malo*) but could also be a skirt (*vala*). He was not explicit about the specific clothing material but commented on the colour, which he qualified as 'funny' or 'curious': 'They had some clothes, that they put in front of their intimate parts and which also covered them against the heat of the sun and which were of a funny colour.'[1]

During his first visit to Tonga in 1773, the British explorer James Cook suggests that most of the late 18th-century cloths were dyed in 'black, Brown, Purple, yellow, and Red' and glazed over to 'resist rain for some time which Otaheite cloth will not' (Beaglehole, 1969: 266). George Forster (1999, I: 229), the natural historian on Cook's second voyage, observed the glazing made of 'a strong glue, which made it stiff and fit to resist wet'. To many of the scientific crew on Cook's ships, the plants used to make dyes remained a mystery (Beaglehole, 1967: 171; Forster, 1982: 545). However, William Anderson, the surgeon and naturalist on Cook's third voyage (1777) mentions both *koka* (*Bischofia javanica*) and *tuitui* (*Aleurites moluccana*) juice (Beaglehole, 1967: 905-906). Cook agrees with this description (Beaglehole, 1967: 172). David Samwell – the surgeon's mate on the *Resolution* – attests that the brown colour is the most common (Beaglehole, 1967: 1037). The descriptions of the young beachcomber William Mariner most closely resemble the way dyes are produced today: in the first decade of the 19th century, he distinguishes koka dye and candlenut (tuitui) dye as well as the red glazing called *hea* from the tree *Parinari insularum* (Martin, 1827, II: 204-205). The French explorer Dumont d'Urville (1832: 269) and the Royal Navy officer John Elphinstone Erskine (1853: 135) confirm Mariner's description. However, Erskine (1853: 115, 136) stresses that the dyes and the varnish do not protect barkcloth from water. This might imply that varnishing is less of practical significance – making it waterproof – than of aesthetic meaning, shininess being identified with a finished and beautiful product (Veys, 2009b; 2013: 43-46; 2017: 161-165). The concept of shininess is expanded below.

The colours black, brown, and red were obtained from koka, tuitui or candlenut, and hea. The koka is an aboriginally introduced or native tree common in plantations and secondary forests in Tonga today. Its timber is sometimes used for fence posts and in house construction. The soot of burnt tuitui nuts was in the past used to make tattooing dye and chewed nuts were a substitute for soap. Today the oil from the nuts is used as a body oil (Whistler, 1991: 131). An infusion of the scraped bark of the koka, or the leaves of the tuitui, is given to infants to treat mouth infections (Whistler, 1991: 58, 131; Whistler, 1992a: 74-75). Hea is an aboriginally introduced tree found uncommonly in and around villages in Tonga. Its fragrant fruit is used for making *kahoa* (lei necklaces) and for scenting coconut oil (Whistler, 1991: 40).

Tamahori (1963: 52) speculates that the yellow colour described by Cook in 1773 might be *tavahi* (*Rhus taitensis*), a large tree indigenous to Tonga and common in its forests

1 Translated from 17th-century Dutch by the author: 'Sy hadden sekere kleetjens, die zy voor haer schamelheydt deden, ende heur mede bedeckten teghen de hette der Sonne, van drollighe coleur' (Schouten 1945 [1618]: 179).

and plantations (Whistler, 1991: 121) or a pale shade of koka. While most areas within the Polynesian triangle[2] use turmeric (*Curcuma longa*) as a yellow barkcloth colouring, remarkably, in Tonga, *ango*[3] or turmeric of which the rhizome (*foha*) yields a rich yellow colour, seems to have been restricted to medicinal use. William Mariner explains that women during their periods, new mothers and their babies and warriors would anoint themselves with turmeric powder mixed with coconut oil in order not to catch cold (Martin, 1827, II: 273). The botanist Arthur Whistler corroborates these historical uses but adds that contemporary uses have shifted to treating skin sores and rashes (Whistler, 1992b: 59). It is not known how the colour Cook perceived as purple was obtained. As language and culture affects the way we perceive colour (Franklin, 2016), what Cook described as grey, might actually have been a shade of grey produced from sprinkled tuitui soot rubbed in with one of the reddish dyes. The Tongan word for grey is *tukumisi*, which is the same word used for a sea urchin that exudes a reddish purple and a yellow fluid (Tamahori, 1963: 52). The corpus of historical barkcloths I studied, however, generally reveals a smaller array of colours ranging from shades of brown to a reddish-brown, known as *melomelo* and real black or *'uli*.[4]

Contemporary dyes

In present day Tonga, a variety of materials are used to make dyes, including locally made plant-based pigments as well as commercial chemical dyes that can be bought in shops in the capital Nuku'alofa. To the koka and tuitui mentioned in historical sources are added *tongo* (*Rhizophora mangle*, mangrove) and *'umea* (red earth). Koka gives a relatively flat brown colour, while tuitui is rather glossy and almost red and so is tongo, which can also be used as a brown hair dye (Whistler 1991: 125). Tuitui stiffens the cloth. Dyes made from bark scrapings such as koka, tongo and tuitui are extracted by spreading the bark pulp mixed with water into a wringer, a *fautaukoka*. The wringer, woven out of *fau* (*Hibiscus tiliaceus*)[5] is neatly bound up, slung over a pole and twisted until juice comes out, and then caught in a container. Black dye is made by burning the candlenuts in a large metal vessel, scraping the soot from its inner surfaces, and then mixing it into the koka dye. In general, these procedures correspond to the pre-1900 accounts. However, it is notable that none of the historical sources I have consulted mentions the use of earth to produce dye. Nevertheless, dye made out of 'umea or red earth is now commonly utilised. Tongans showed me the places in 'Eua where this material is extracted and assured me that it could also be found in Fiji. Tamahori (1963: 71) asserted that very

2 Turmeric has been attested as colouring on barkcloths from Tahiti, Cook Islands, Austral Islands, Mangareva, Hawai'i, Marquesas, Rapa Nui, 'Uvea, Futuna, Rotuma and Fiji (Kooijman, 1972: Appendix 1, Table E).

3 Other names used include *ango kula*, *angoango kula*, or *ango enga* (Whistler, 1991: 17).

4 A notable exception is a Cook/Forster barkcloth (Oz 577) held in the Institut für Ethnologie und Ethnologische Sammlung der Georg-August-Universität Göttingen, which shows orange to yellow hues (Veys, 2017: plate 4).

5 The indigenous beach hibiscus is a common tree of littoral habitats and disturbed forests in Tonga. The soft, durable wood is frequently used in light constructions. The bark fibres are or were fashioned into cordage, sandals (*teka*), garment mats, kava strainers, and other items. Various parts of the plant are used in Tongan remedies; most commonly the bark slime is applied to eye ailments, and an infusion of the bark is drunk to treat stomach ache. Two varieties of fau are recognised, *kula* (red) and *hina* (white), based on colour differences in the bark (Whistler, 1991: 29). (See Plant Profile 5.)

sticky red clay could be found in Vava'u too, something that Andy Mills witnessed more than 40 years later in 2005 on the hills surrounding Vava'u's capital Neiafu.[6] The earth is gathered and formed into cones, which are left to dry. When needed it is pounded and mixed with the koka dye.

The meaning of colour

Anderson's 1777 account is the only historical source that proposes a practical aspect to the use of colour: black for cold and brown for hot weather (Beaglehole, 1967: 906). Contemporary barkcloth colours seem to be related to particular values in Tongan society where white is associated with purity, brown with beauty and black with awe and respect.

Today Tongan barkcloth is mostly linked to the colours black and brown-red. However, until the late 19th century, undecorated barkcloths appear as a culturally significant category (Veys, 2017: 82-83). White barkcloth, which is not dyed, could be brought into connection with the pan-Polynesian idea of *noa*. Even though the linguist Churchward (1959: 379) gives a rather negative definition of noa being 'any kind of, any old, of no particular kind, common, ordinary, of no value or importance, worthless, unimportant, causeless, meaningless, aimless, futile, without payment or without result, unreal, purely imaginary', 'white' might be associated with the meaning noa has in other Polynesian islands for instance 'free,' 'nothing,' 'unmarked,' 'unconstrained'. However, Mills (2016: 82) notes that, in a Tongan context, the state of being without *tapu* (sacredness, untouchability) would have been more appropriately glossed as *ngofua* meaning 'easy' or 'permissible' (Churchward, 1959: 390). The fact that very few of the uncoloured 18th-century barkcloths have ended up in museum collections might reflect the special status of uncoloured or white barkcloth.[7] The ethnoarchaeologist Hélène Guiot (2017: 314-319) argues convincingly that white barkcloth, in many of the Polynesian islands including Hawai'i, Fiji, the Marquesas and the Cook islands, was associated with divinity in the way it served as a wrapping for spaces, people and things from which a strong sacredness (*mana*) emanated. The architecture historian, Albert Refiti explains that in Samoa material things are prepared and stripped of all superfluous elements to reach a status of 'whiteness', the most appropriate way of making presentations before the ancestors. Therefore house posts need to be smoothed and the highest valued fine mats appear white as the sea has smoothed and bleached the pandanus fibres from which they were made (Refiti, 2009: 9-10). Could the pre-19th-century notion of white, meaning 'consecration,' have been transposed to how sacredness is expressed in the introduced Christian religion? Hence one could argue that the way one once appeared before the ancestors is now considered the appropriate way to appear before God. Indeed, today, white has a strong association with the Christian notion of purity exemplified in children. On White Sunday or Children's Sunday (*Fakamē*), Tongan children and teenagers are celebrated with a church service entirely organised by the young Tongans themselves dressed in white with their finest *ta'ovala* (fine waistmat) (Morton Lee, 2003: 104; Figure 11.2). White could however also be the opposite of black which, according to both Garth Rogers (1977: 162) and Françoise Douaire-Marsaudon (1996: 139), might refer to having powers of cursing, witchcraft and magic.

6 Personal communication, September 2018.

7 There is only one white 18th-century barkcloth known, which belongs to the Bruni d'Entrecasteaux collection in the Musée des Beaux-arts of Dunkerque (Veys, 2017; Douglas, Veys and Lythberg, 2018).

Figure 11.2. The white clothes of the newly crowned King Tupou V and the fine white mat wrappings of the chiefly attendants to the royal kava ceremony underline the divine status of the king and the event. Pangai Lahi, Nuku'alofa, Tonga, 2008.

Numerous historical sources emphasise the brown colour of Tongan barkcloth (Beaglehole, 1967: 1302; Forster, 1982: 377; Forster, 1999, I: 229, 415). The anthropologist Gaia Cottino (2011) who researched the perception of a healthy body in Tonga, gives a number of quotes which make clear that a brown skin is associated with beauty: 'If I had to say what a beautiful Tongan woman is without having talked to her, I would say that the skin needs to be fair, not white, but brown, long hair and well-proportioned legs … The Tongan colour should not be too fair or too dark, it is for the new generations that a fair skin is a sign of beauty … Brown is beautiful, not fair, not black.' [8] It can be concluded that covering one's body with a brown cloth mimics the colour of the skin and is therefore considered beautiful.

Brown, certainly in its more orange manifestation is complementary to blue, the most prevalent colour of the sea and the sky in Tonga. Complementary colours when placed next to each other create the strongest contrast possible. As the perception of blue depends greatly on the other colours that surround it, blue appears bluer in the vicinity of rusty brown (Miodownik, 2015: 76). Would this fact explain the perceived beauty of brown? Moreover, the dualism between the blue sea and the brown land is essential in Tongan

8 'e devo dire com'è una bella donna tongana senza averle parlato direi che la pelle deve essere chiara, ma non bianca, marrone, capelli lunghi e gambe ben proporzionate … il colore tongano non è né troppo chiaro né troppo scuro, è per le nuove generazioni che la pelle chiara è segno di bellezza … marrone è bello, né chiaro né nero' (Cottino, 2011: 149).

social organisation and thought. Success and prosperity in the community could only be guaranteed if the men at sea (*siu tahi*, fishers of the sea) and the women on the land (*siu ʻuta*, fishers of the land) were mutually supportive. On a political level, every chief today has next to a talking chief (*matāpule*) also a mariner (*toutai*) to go out fishing (Bott, 1982: 65-66; Bataille, 2002: 143-144).[9] It can probably be argued that brown's aesthetic pleasure is enhanced through the cultural position it occupies in the binary of land and sea.

The colour black has especially great significance in Tongan barkcloth. It is associated with chiefliness because in the past it was so time-consuming to make. Today *ngatu ʻuli* (black barkcloth) still constitutes the highest-ranking barkcloth and is rarely made. Phillis Herda (1999: 157) asserts that ngatu ʻuli is never for sale: it would be *fieʻeiki* (acting uppity/above one's situation) to do so. Even in the modern cash economy, it is not deemed acceptable for this highest of barkcloths to be produced, except at the instruction of *ʻeiki* women for a chiefly purpose. Moreover, its value is not convertible into cash because it is derived from high chiefly connections (Herda, 1999: 157). The ngatu ʻuli made exclusively for and presented at the titular appointment of the King Tupou V's youngest son to the title of ʻUlukālala in 1991 (Kaeppler, 1996: 111) is an example. Another instance is represented by the piece, which was part of the wedding bed of the royal couple ʻEiki (Honourable) Sālote Lupepauʻu Salamasina Purea Vahine Arii ʻo e Hau Tuita and Mataiʻulua-ʻi-Fonuamotu Fusituʻa in 2003 (Veys, 2017: 135-137).

Today, as in the past, draping the house of the deceased in black constitutes the highest honour one can accord to their family (Martin, 1827, I: 316; Turner, 1833; Wilson, 1844; Veys, 2009b; 2017: 162). With the arrival of Christianity in the early 19th century, black also became associated with mourning. Indeed, to attend any Tongan funeral one is required to don black clothing, which the closest of kin will wear for a very long period. During the funerary rites for kings, all the buildings in the capital city are covered with black strips of cloth, often adding some purple bows,[10] to signify the nation is mourning for a royal member (Figure 11.3). Black dye obtained from candlenut (tuitui) was used to provide the wrapped body with a protective layer in the same way that tattooing does and did (Veys, 2017: 144).

In contemporary Tongan philosophy, black occupies a particular position, as is exemplified by the contemporary artwork of Visesio Siasau. On Friday 9 June 2017 he opened a solo exhibition *ʻUli i he ʻuli – Black on Black* at Orex Art Gallery in Auckland, Aotearoa New Zealand, featuring eight large canvases of 2m by 2m in size. Building on indigenous Tongan science, Siasau explains that the colour black signifies the sacred space, *vāvā tapu* in which the energy and vibration encapsulates the unlimited potential of chaos and harmony,[11] the latter often exemplified through social control.

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9 This was based on the royal model of the *matāpule,* the *toutai,* and the *haʻatufunga,* the undertakers dealing with the burial of the king on land.

10 While purple is not exclusively reserved to Catholic Tongans – the royal burying grounds always have purple cloth garlands during a royal mourning period – it is particularly popular among that denomination. Mills witnessed how all the Catholic households and church buildings were decorated with purple cloth when Pope John Paul II died on 2 April 2005 (personal communication, Andy Mills, September 2018).

11 Personal communication, October 2016.

Figure 11.3. Donned in black as a sign of mourning, men are carrying the black bier with the casket of the deceased king Tupou V. Pangai Lahi, Nukuʻalofa, Tonga, 2008.

Sheen: a property of white

Historical sources comment on the shininess of barkcloth, which was obtained by using hea, from the tree that is now threatened with extinction in Tonga (Whistler, 2011: 14). Shininess is an aesthetic quality, still hugely appreciated in barkcloth today, but also in wider Tongan society and even worldwide (Douny, 2015: 104-105; Figure 11.4). Barkcloth has to shine and is thus rubbed with coconut oil as were the barkcloths and fine mats of the 2006 wedding bed, which was prepared under the supervision of the mother of the groom-to-be and her family. This glistening 'skin' is also provided to people who are at the centre of a ritual. Tongans say that when rubbed on dancing females, coconut oil should sit on the skin and not be absorbed by it, as coconut oil, which does not permeate the body, signifies virginity and thus sexual restraint. Well-oiled objects made by women can therefore iconise social control, a value highly appreciated by Tongan society as the opposite, sexuality, is associated with individualism, lack of social control, and danger (Besnier, 2011: 167). Furthermore, shininess is a quality that is also present in the *koloa siʻi*, especially in the *keke*, the cakes. These are usually wrapped in cling-film so that their surfaces catch the light (Veys, 2013: 43-46; 2017: 161-165). Michael O'Hanlon demonstrates, in his anthropological study of adornment among the Wahgi in the Highlands of New Guinea, that the pair gloss/glow versus matt/dull are more important than colour in assessing public displays. He considers the pig fat through which people obtain their glowing appearance as the material manifestation of the fertility that is sought during the Pig Festival, but also of the ancestral favours that are needed to enable growth (O'Hanlon, 1989: 114-120). The anthropologist Sandra Revolon (2018) argues that on Aorigi, in the eastern Solomon Islands 'light interferences' or 'plays of light', 'whether natural or created by humans

Figure 11.4. The barkcloth pathway laid out for the new King Tupou V glistens in the sun. Vaha'akolo Road, Nuku'alofa, Tonga, 2008.

[…] make tangible both the presence of invisible powerful beings and their capacity to act on the world; their mana' (Revolon, 2018: 4, 5). Refiti (2009) equates the notion of whiteness to that of illumination. In Samoan thought, he argues, 'light' is conceptualised as 'knowledge and understanding' that comes from within people or things (Refiti, 2009: 15). It may be argued that in many places in the Pacific, objects that are marked by shininess are revealing their efficacy and are making discernible the control of generative powers. Linking these ideas back to Tonga, one can conclude that illumination makes meanings apparent.

Governing principles

The Tongan way of organising the world often goes in pairs: land and sea, the visible and the invisible world, male and female realms, etc. These contrasting and complementary domains constitute a basic structure for values, status, responsibility, temporality, and space (Veys, 2017: 147). The Tongan scholar ‘Okusitino Mahina also thinks in binaries when it comes to colours: black is linked to women, red (*kula*) or red-brown is associated with men (Mahina, 2009). The artist Filipe Tohi recognises these qualities of brown or red (kula) being related to men, hierarchy and the gods, and black with women, the earth and human relationships (Stevenson, 2015). The use of these contrasting colours on barkcloth enhances its visibility, but also holds society and protocol, female and male realms, in balance. It seems that the colours used on barkcloth adhere to the binary principle by which the material world is categorised. This structure is exemplified by the notions of *koloa*, prestigious objects usually associated with women, and *ngāue* resulting from mostly male agricultural labour (Kaeppler, 1995: 103; Herda, 1999; Young Leslie, 1999; Kaeppler, 2007: 146; Douaire-Marsaudon, 2008; Addo, 2013).

White, as a pathway between worlds, holds everything together. The shininess appearing on *ngatu* by virtue of reflecting white light on its surface reinforces and deepens the cultural meaning of barkcloth colours: they reinforce in a symbolic manner the connections between people, between people and their environment, and between people and other sacred powers.

~ Plant Profile 9: Red dye ~

Koka *Bischofia javanica* Blume
PHYLLANTHACEAE

Mark Nesbitt

Left: Tree at Nuuanu, Oahu, Hawai'i.
Right: Art Whistler 446, Upolu, Samoa, 1973 (National Tropical Botanic Garden, PTBG1000053482).

Koka is an important timber tree, growing to 35 metres high, and planted on some Polynesian islands for modern forestry. It is native to much of tropical Asia but its status in Polynesia is uncertain. When the bark is scraped, it reveals a bright sapwood that makes a brownish-red dye. The scraped-off wood shavings are packed into a wringer made from sea hibiscus fibres or plastic, which is twisted to squeeze out the resinous coloured sap. It is an important dye in Tonga, ʻUvea, Futuna, Samoa and eastern Fiji (Chapters 2, 5, 9, 10). It is used with rubbing boards (Fiji: *kupeti*; Samoa: *ʻupeti*; Tonga: *kupesi*) to transfer the patterns to barkcloth. This dye was not identified in two recent analytical studies of barkcloth (Flowers et al., 2019; Tamburini et al., 2019).

Vernacular names (selected): Tonga, ʻUvea, Futuna, Cook Islands: *koka*; Samoa: *ʻoʻa*; Fiji: *tongo-tongo.*

~ Plant Profile 10: Black dye ~

Candlenut *Aleurites moluccana* (L.) Willd. (recently renamed as *A. moluccanus* to match the masculine genus) EUPHORBIACEAE

Mark Nesbitt

Left: Leaves and fruit at Honokowai Ditch Trail, Maui, Hawai'i.
Right: Johann Forster 214, Cook's second Pacific voyage, 1772-5 (Natural History Museum, London, BM001014824).

The candlenut tree is native to tropical Asia and was introduced to Polynesia by prehistoric settlers; it is widely cultivated by being grown from seed, but is sometimes locally naturalised in mixed damp forests. The tree grows to 15 metres tall and can be cultivated in a wide range of tropical environments. The most-used part of the plant is the fruit, which is rich in oil. Both the whole nuts (with shell removed) and the oil could be burnt for lighting; the oil also has medicinal and cosmetic uses. The soot from the burnt fruits is an important black dye used in many islands of Polynesia and Fiji for tattooing and for colouring tapa (Chapters 5, 10). The sap of the tree is an important base for several red-brown dyes.

Vernacular names (selected): Tonga, Niue, Futuna, 'Uvea, Cook Islands*:* *tuitui*; Society Islands: *ti'a'iri, tuitui*; Hawai'i: *kuku*i; Fiji: *lauci, tuitui*; Samoa: *lama.*

12

Barkcloth from the Islands of Wallis ('Uvea) and Futuna

Hélène Guiot

In the two islands of Wallis (formerly known as 'Uvea)[1] and Futuna, the fabrics produced today and designated under the generic term tapa, carry more specific denominations of *siapo*, *lafi*, *gatu*, *tepi*, *salatasi*, *lava* and so on, as described below. The variety in this terminology, which has been employed for centuries, reflects the unchanging nature of certain ancient practices of tapa making; something which can also be seen in their social function and material forms, and in the cultural concepts with which they are associated. I examine these practices, materials and classifications here.

Manufacture

The manufacturing process of tapa in Wallis and in Futuna is similar to that practised elsewhere in Western Polynesia (Bataille-Benguigui, 2009; Veys, 2009a; Veys, 2017). The women remove the bast of the paper mulberry (*fu'u tutu*, *Broussonetia papyrifera*), lay it on a wooden anvil (*tutua*) and beat it with a mallet (*ike*), which may be either grooved or not and is sculpted from the imperishable wood of the *toa* tree (*Casuarina equisetifolia*). By this means, they obtain regularised strips (*lau tutu*) of beaten bast. These are then felted together to create sheets of small dimensions, or thicker pieces, or well glued to obtain more extensive surfaces within the framework of a collective labour. Traditionally, the glue was the starch of the *māhoa'a* tuber (*Tacca leontopetaloides*, the Polynesian arrowroot), but today the women use manioc starch or commercially bought laundry starch.

Today, all the fabrics produced are ornamented with motifs. These are applied freehand with pens made from the midribs of coconut palm leaflets, *tua niu* (Burrows, 1937: 132) or the fashioned extremity of the coconut leaf midrib, or brushes made from the fruits of the pandanus. Decoration is also applied by rubbing over a patterned matrix (*kupesi* on Wallis, *kupeti* on Futuna), which is constructed from joined pandanus leaves overstitched with coconut leaflet midribs. In the 1930s, carved wooden pattern rubbing tablets were introduced, as had also happened in Samoa some decades before (Burrows, 1937: 132-134).

1 'Uvea is the vernacular name of Wallis island. Both names are used here.

in: F. Lennard & A. Mills (eds) 2020: *Material Approaches to Polynesian Barkcloth. Cloth, Collections, Communities*, Sidestone Press (Leiden), pp. 179-184.

	Bark	Fruit	Root
***Ago*, turmeric (*Curcuma longa*)**			Orangey-yellow. In Futuna and in Wallis (Burrows, 1936: 189).
***Hea* (*Parinari insularum*)**		Mashed or macerated. Varnish which glazes certain tapa styles, notably the *gatu uli* (black *gatu*).	
***Kanava* (*Cordia subcordata*)**	Red pigment. In Wallis (Dupuy, 1993: 38).		
***Koka* (*Bischofia javanica*)**	Macerated. Pigment variable from brown to a clear red. In Futuna (Burrows, 1936: 189) and in Wallis (Burrows, 1937: 132).		
***Loa* (*Bixa orellana*)**		Bright red. In Futuna. According to Burrows (1936: 189), this recently introduced tree has replaced the use of red ochre.	
***Nonu* (*Morinda citrifolia*)**			Yellow. In Wallis (Cusenier, 2000: 88).
***Pou muli* (*Flueggea flexuosa*)**		Mixed with loa. Violet colour. In Wallis (Cusenier, 2000: 87).	
***Togo fafine*, mangrove (*Bruguiera gymnorhiza*)**	Chocolate-brown pigment. In Wallis (Burrows, 1937: 132; Dupuy, 1993: 52).		
***Togovao*, cerisier bleu, blue marble tree (*Elaeocarpus angustifolius*)**	Brown. Mixed with mangrove bark. In Wallis (Cusenier, 2000: 87).		
***Tuitui*, candlenut (*Aleurites moluccana*)**	Dark brown. In Futuna (Burrows, 1936: 189) and in Wallis (Burrows, 1937: 132).	Black. Soot produced by burning the nuts, made up with water or coconut oil. In Futuna (Burrows, 1936: 189) and in Wallis (Burrows, 1937: 132).	

Table 12.1. Plant materials used to decorate ‘Uvean and Futunan barkcloth.

Vegetable and mineral pigments

To realise their motifs, women prepare a range of essentially vegetable pigments, as shown in Table 12.1 (Guiot, 2009a).

Non-plant materials were also used. In his ‘Uvean dictionary, Father Bataillon notes ‘*Kele kula, Kele mea:* The name of a type of red earth which serves the women for colouring the gatu’ (1932: 215). On Futuna Father Grézel also indicated the usage of black earth, *kele uli* (cited in Burrows, 1936: 189). These pigments are no longer used. Since the 20th century, different imported products have also been adopted for use as decorative materials including dyed textiles, felts and Chinese inks; today, this latter pigment remains the most-used product for the tracing of the finest black motifs.

Classification of tapa types by manufacture and decorative motifs

The people of Wallis and Futuna distinguish several types of tapa on the basis of their mode of manufacture and the motifs which they bear.

The women of Futuna have developed a linear and geometric design style, forming symmetrical and repetitive weaving motifs, which characterises the two tapa forms *lafi* and *sala* (Burrows, 1936: 186; Kulimoetoke, 2014). These two forms were used for clothing: lafi as a waist belt and sala to make aprons (*salatasi*, *salalua*) (Figure 12.1). However, those Futunan fabrics rubbed with motifs from kupeti matrices take the names of *siapo* or *tepi*.

Figure 12.1. Salatasi collected at Futuna, in 1893 or 1894, by Lieutenant-Commander Félix Albert Armbruster (1870-1909) (Fonds Bouge, Musée des Beaux-Arts de Chartres, 00.2.4).

These two fabric types are distinguished by the latter also bearing freehand-drawn motifs around their edges (Burrows, 1936: 186, pl. 10; Kulimoetoke, 2014). On Wallis this type with hand-painted elements takes the name lafi, while the tapa cloths decorated with kupesi rubbing boards only are named *gatu*. The fabric type *tahiki* presents a decoration obtained with the newer style of carved wooden kupesi boards (Burrows, 1937: 135). Thick white fabrics were also produced, and Burrows (1936: 186) describes two Futunan forms: the *lafi tea*, with fringed and serrated edges, and openwork, cut out motifs; and the *sole*, which is the same as the preceding, but extremely fine and similar to lace.

Finally, to speak precisely of current practice, Wallisians and Futunans often resort to using the term tapa to designate barkcloth in a general manner. However, according to Monsignor Bataillon (1932: 357) – the first missionary to live on 'Uvea, who arrived in 1837 – the term tapa precisely designated only (as in Tonga) the 'white part of a gatu'. On Futuna, conversely, siapo is still the term used when speaking of fabric in general.

The many functions of tapa

The different types of tapa outlined above were destined for different and distinct uses, which I discuss here.

Clothing

The earliest European descriptions (Lemaire and Schouten at Futuna in 1616; and Samuel Wallis at 'Uvea in 1767), either describe the islanders as naked, soberly covered, or wearing a sort of mat around the waist (Schouten, 1618: 60; Hawkesworth, 1773: 495). One can suppose that, like neighbouring islands, the pubic coverings, modestly described, were also manufactured from tapa. From the early 19th century onwards, Western voyagers multiplied and from them we learn a little bit more about local clothing. For example, at 'Uvea in 1831, Oliver (1848: 133) noted that the king wore a tapa cloth surrounding his body from the armpits down to his feet. The loincloths were obtained from the tahiki and lafi varieties, and from the gatu: 'They wrap the body in very fine mats and, more often, with a fabric they call gatu or tape [sic]… the tape resembles a thick paper or slightly gummed tapestry' (Bataillon, 1941: 6-7). In his dictionary, Monsignor Bataillon describes some forms of garment worn at 'Uvea: the *ao* or *ao fuga*, 'A long bonnet which the natives wear on the head' (1932: 55); the *lava*, a belt of leather or tapa which one wears like a bandolier, or a deacon's stole (1932: 238); and the v*ala*, a kilt-like garment enveloping the middle of the body (1932: 407).

In 1932, the ethnologist E.G. Burrows conducted his research at Futuna and 'Uvea. For Futuna, he described the following usages (1936: 186-187): the tepi fabric type was used for the loincloths called lava. The sala fabric became a salatasi, salalua or *salatolu* garment depending on whether its length allowed it to cover one (*tasi*), two (*lua*) or three (*tolu*) turns of the waist. The lafi fabric type was destined for the pubic coverings, and the turbans known as *sa'i* and *fa'ufa'u*. The lafi tea ('white lafi') fabric was reserved for garments covering the upper half of the body; the same also applied to the finer lacy sole type, but this was only for ceremonial occasions, such as the funeral of a king. For Wallis, Burrows (1936) records that the loincloths called *leuleu* and *holo* were cut from a gatu cloth. He describes the *gatu uli*, covered with black pigment and varnished, worn around the waist during dances, such as the *kailao* where the men rhythmically brandish dance-clubs of the same name (Burrows, 1937: 149). He observed that, otherwise, the dancers of Vaitupu village wore costumes of white tapa (1937: 151), which must have been increasingly rare during the period of his research, since he specifies elsewhere that white fabric had not been commonly worn for many years (1936: 136). He lists two types of belt with fringed ends (Burrows, 1937: 135): first, *no'o* belts (with motifs of freehand-painted lines and points, alternating with coloured bands obtained by rubbing); and second, *fau* belts (with motifs of vines, flowers and stars). Finally, gatu and siapo served (and sometimes still serve) as the last bodily envelopment, providing shrouds for the bodies of the deceased.

Tapa and divinities

Father Chanel, the first missionary to arrive on Futuna in 1837, twice observed a piece of tapa fabric being used as the receptacle of the divinity (*atua*) Fakavelikele: once during the ritual preparations for a war between the island's two chiefdoms (Bataillon, 1932: 186); once at the investiture ceremony of the high chief Vanai (Nicolet, 1923: 218). On Futuna, Fakavelikele was something of a 'titular deity'; that is to say, it was both the name of supreme divinity and the title received by a newly invested chief (Favole, 2000). This information is essential, as data on the pre-Christian religion of Wallis and Futuna is still scarce, and it accords with the historical use of tapa as a spiritual receptacle evidenced in other Polynesian archipelagos further east (Guiot, 2017).

Tapa and the ceremonial economy

Gatu and siapo, as termed at Wallis and Futuna respectively, are the pillars of customary ceremonial presentation or gifting. The fruits of female collective labour, these fabrics are prepared for the ceremonies associated with the life cycle's rites of passage (birth, first communion, marriage and funerals). There is therefore a close link between tapa, the female body and the ritual responsibilities of women (Chave-Dartoen and Fromonteil, 2017). The patterns applied in repetitive sequences with the rubbing matrices, their

Figure 12.2. Gatu from Wallis Island, five cubits (*lalaga e nima*) long. Collected during the 20th century. La Neylière.

borders re-emphasised with overpainted brown-black lines, define templates that allow the scale of each cloth to be measured out when offered in its entirety, or when subsequently divided into fragments (Figure 12.2). Because, according to circumstances, gatu and siapo (Kulimoetoke-Gaveau, 2017) are either presented as a complete *lau te fuhi* or *tekumi*, comprising a hundred cubits (45-50m) in length, or they are divided into pieces of ten cubits (known as *lau hogofulu* or *lau agafulu*), or pieces of twenty cubits (termed *laulua* on Futuna).

Tapa is a valuable or *koloa* which is specific to women. At Wallis, 'the women dispose of it freely, offering it as gifts and using it to fulfil their tributary obligations and customary fines' (Chave-Dartoen, 2010: 149). It constitutes, with plaited mats, the feminine part of the ceremonial economy; a necessary complement to the masculine part constituted by pigs and root vegetables. Accumulated as storable wealth, these fabrics are presented ostentatiously and exchanged in great quantities, constituting the fundamental substance of vast exchange networks. They make visible and instantiate social relations and structures, and they display the relative status of each exchange partner.

Chronological changes in tapa style

Anciently, and like elsewhere in Western Polynesia, the tapa of Wallis and Futuna was ornamented with geometric figures. With the arrival of the Marist missionaries in the 1830s, however, new motifs appeared; Burrows (1937: 130-134) lists examples such as the fleur-de-lis and the sacred heart. The appearance of these figurative Christian motifs went hand-in-hand with the diversification of tapa's usage: it became decorative, and notably for the interior of churches. The adoption of a full figurative style soon followed. Around 1955, and until approximately the 1990s, the girls of the schools run by the nuns of the Soeurs Missionaires de la Société de Marie (SMSM), created the *lafi tai mo 'uta* or 'sea-and-land tapa', which reproduced scenes of island life. They divide images of activities into two friezes; on one side are the dances, kava ceremony, and the vegetable products of the terrestrial environment; on the other, there is the maritime environment where the men fish in their canoes, at the centre of a fertile lagoon of fish and shellfish. Under an anecdotal appearance of scenes of everyday life, lafi tai mo 'uta reflect a reality deeply embedded in the ideal landscape of the Wallisian islanders (Guiot, 2009b).

As a kind of emanation of these paintings, an important tapa product arose in the 1960s and continues today: destined for trade, it brings a complement of cash resources to local families. This is the tapa of lafi type, ornamented with symmetrical and repetitive geometric motifs, or figurative representation of the maps of the two archipelagos surrounded by seashells. They take the form of decorative panels, or integrate manufactured goods (such as bags, briefcases and chequebook-holders), and are primarily bought by tourists. Thereby, today, two forms of tapa production coexist: barkcloth making for trade and the continuing manufacture of gatu and siapo within a ceremonial context. The inhabitants of Wallis and Futuna (Kulimoetoke-Gaveau, 2017), like members of the diaspora settled in New Caledonia[2] and Europe, often invest in the circulation and the presentation of these emblematic fabrics of their culture.

Conclusion

In Wallis and Futuna, the history of fabric art has been a long and distinctively Austronesian one: it expresses the role of the feminine in the renewal of the principles of life; the spiritual and ceremonial importance of wrappings which separate and contain; an intimate scientific knowledge of the botanical environment; and the place of exchange at the centre of traditional social structure in Polynesia. Modifications in the mode of life have caused the disappearance of certain forms of tapa (notably those related to ancient rituals), while creating others for decorative use and sale to tourists. Members of Wallis and Futuna society have accorded a continuously-renewed importance to gatu, siapo and lafi throughout these transformations, as fundamental components of customary ceremony, and in a certain, fluid fashion, as icons of their changing cultural identities.

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2 See for example the two booklets of the 2011 exhibition, *Les Richesses de Tositea. Siapo, Gatu et Autres Étoffes d'Uvea et de Futuna*, at the Musée de la Nouvelle-Calédonie: https://museenouvellecaledonie.nc/expositions/les-expositions-temporaires/les-richesses-de-tositea-siapo-gatu-et-autres-etoffes-duvea.

13

Barkcloth in the Māori World

Patricia Te Arapo Wallace

Introduction

Barkcloth, or *aute* in Māori, once retained an element of high prestige in the cultural memory of Māori. The eastern Polynesian navigators who sailed into the southwest of *Te Moana-nui-a-Kiwa* (The Great Sea of Kiwa, the Pacific Ocean) came from tropical islands where barkcloth was the principal source of clothing. However, in the Māori world, things would change, and this chapter attempts to bring together the history and nature of such changes with the spiritual and cultural values of the inhabitants. While the role of aute would become infeasible as a key source of clothing, barkcloth also held a numinous quality. It could show status, play a role in ritual and provide a conduit between men and the gods. But perhaps most importantly of all, barkcloth maintained a link between Māori and the homeland they called Hawaiki.

The Māori ancestors

The eastern Polynesian explorers who discovered the islands of Aotearoa New Zealand presumably studied the local flora and recognised the absence of certain species which they considered significant. When their descendants eventually migrated to Aotearoa New Zealand, they brought specific 'canoe plants' with them. The aute (paper mulberry, *Broussonetia papyrifera*), a major source of barkcloth, was one of six introduced cultigens that survived (Furey, 2006). These first settlers began establishing new lives that incorporated the familiar practices they had left behind, but things were not the same in Aotearoa New Zealand's temperate climate. In order to survive, they learned to adapt their traditional knowledge to meet the challenges of their new environment. Leaves and fibre from the plentiful indigenous *harakeke* (New Zealand flax, *Phormium tenax*) became a new clothing material resource, replacing bark for these early ancestors of the Māori people.

Traditions of barkcloth

For Māori, the term 'aute' encompasses both the source plant and the cloth made from it. Over time, the deeds of ancestors were retold in oral traditions. According to one tribal history, the aute was first planted by Whaka-o-ti-rangi, a woman who brought it aboard the Tainui *waka* (canoe). A second woman on board named Mārama also planted

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aute, but according to claims that she had been indiscreet on the journey, her plant did not 'come true'. Instead it appeared as the *whau* (*Entelea arborescens*), unsuitable for making barkcloth (Colenso, 1881: 41-42). In contrast, a different tradition maintains that a small plantation was established at Waihīhī, in western Hauraki. Named Te Uruaute-o-Mārama-tāhanga (Mārama's aute grove), it reportedly flourished into the beginning of the 19th century. Aute is still remembered in place names and ancestral names. A *hapū* (sub-tribe) of the Ngāti Whanaunga (Whanaunga tribal group) was known as Ngāti Aute; Kiwi Te Aute was a direct descendant of Mārama (also known as Ngāti Aute) (Graham, 1949: 74).

Barkcloth clothing

'In ancient days … garments were made from the bark of the aute tree, such garments being called Te Kiri o Tāne – the skin of Tāne, lord of the forests' (Andersen, 1907: 322). However, there is no physical evidence that early Māori dressed in barkcloth. While traditional references mention the *maro aute* (aute loincloth), nothing is known of it; it is assumed to have simply been a long length of cloth (Hiroa, 1949: 161). How successful the ancestors were in producing quantities of wearable cloth is unknown, but it is unlikely that barkcloth proved completely satisfactory for all weather conditions in Aotearoa New Zealand. Furthermore, adequate supplies of bark may have been limited; evidence suggests that the aute plant did not thrive in the temperate climate. Nonetheless, the oceangoing travellers had a range of fibre textile technologies. By applying these to locally available resources, they were able to develop alternative new forms of dress that better suited their needs. Precious strips of white barkcloth known variously as *kope*, *turuki*, or *whakakai* (aute ear ornaments) and sometimes strips used as hair ties, became important symbols of status (Hiroa, 1924: 34). Images sketched by Sydney Parkinson in 1769 show men wearing rolled strips in their ears (British Library, MS 23920, f.60 (d) and B.L. MS 23920, f.64 (d)).

Ongoing production of barkcloth

Evidence shows that the ancestors persevered in their endeavours to produce barkcloth, beating strips of the inner bark as done in other Polynesian islands for generations. Examination of 15 recovered barkcloth beaters found across the upper half of the North Island has established that the beaters were made of local woods; predominantly branch heartwood of New Zealand *kauri* (*Agathis australis*) plus one of *rimu* (*Dacrydium cupressinum*) or *tōtara* (*Podocarpus totara*), and another of *mātai* (*Prumnopitys taxifolia*) (Neich, 1996: 126-138; 2002: 13-15). The collation of traditional records relating to aute trees and barkcloth with documentary records of the same, combined with the location sites from which the barkcloth beaters were retrieved, shows that attempts to produce barkcloth were reasonably widespread – from Northland as far south as Taranaki, and as far east as Hawke's Bay (Neich, 1996: 114).

The skills of barkcloth workers were valued. It was reported that the 19th century Ngāti Awa fighting chief, Te Rangikawehea, kept two Ngā Maihi workers, Te Whata-manu and Te Manawa, 'as beaters of aute, for that was the clothing of old, and those two were clever at that work' (Best, 1898: 653; 1903: 215-216). As an alternative resource, Māori experimented with indigenous trees. They apparently applied the same beating technique to strips of ribbonwood and lacebark species (*Hoheria* sp.), thereby producing a uniquely local barkcloth (Hiroa, 1949: 162), but this does not appear to have been widely used.

Observations of aute

While some introduced cultigens flourished in warmer regions, others were less successful. In October 1769, during James Cook's first voyage, he noted Māori enthusiasm for trading barkcloth, but it was two months later in the Bay of Islands that he first recorded seeing barkcloth plants:

> We met with about half a Doz^{n} Cloth Plants, being the same as the inhabitants of the Islands lying within the Tropicks make their finest Cloth on: this plant must be very scarce among them as the cloth made from it is only worn in small pieces by way of ornaments at their ears and even this we have seen but very seldom. Their knowing the use of this sort of Cloth doth in some measure account for the extraordinary fondness they have shew'd for it above every other thing we had to give them, even a sheet of white paper is of more Value than so much English cloth of any sort what ever …. (Beaglehole, 1955: 258).

Both Joseph Banks and Sydney Parkinson saw the same small plantation. They confirmed the six plants were definitely paper mulberry (Banks, 1962, I: 444) and a herbarium specimen was collected (Harris, 1999).

But while Māori were keen to trade for barkcloth, one rather ironic exchange occurred on this journey. Banks acquired an old cloak which had lost most of its attachments, but had a particularly unusual *tāniko* (weft-twined ornamental) border. Now housed in the Etnografiska Museet, Stockholm (Catalogue number 1848.1.63), this cloak has a small piece of patterned Pacific barkcloth attached to its tāniko border. Evidence of further stitching suggests this section is all that remains of a long strip that once extended across the cloak's border. Did that strip of barkcloth perhaps once serve as a tribal history mnemonic?

Spiritual and ritual use of aute

In the Māori universe, the natural and supernatural worlds were one, at the centre of which were the *atua* (gods). Some tribal gods were reputed to have been brought from Hawaiki; some were deified *tīpuna* (ancestors) (Hiroa, 1949: 461). Lesser gods and other supernatural entities were known as *tipua*. Any rituals invariably involved a *tohunga* (savant) to make appropriate *karakia* (invocations). However, details are sparse, probably indicating the reluctance of tohunga to pass on such information to unschooled individuals rather than reflecting the frequency of practice. Aute could both conceal and reveal the presence of gods; and as Māori deemed the head to be the most *tapu* (sacred) part of the body, human hair had a particular efficacy. Purportedly brought from Hawaiki, Ihungaru was a tribal god of the Rotorua district. He was described as being formed from a lock of human hair, twisted or braided with aute (White, 1885: 171; Hiroa, 1949: 462). The purpose of the '*whakanoho manawa*' rite was to cause the breath of life to persist. In order to exorcise a malignant spirit, one custom was to place a piece of 'aute bark' as a *waka atua* (supernatural conduit) upon the ailing person, and make appropriate karakia (Goldie, 1904: 56).

Aute wrapping featured in the story of a special *hinau* tree (*Elaeocarpus dentatus*) in the Urewera territory. The ancestor Irakewa had placed the *iho* (umbilical cord) of his grand-daughter Kātaka on the tree. Much later, when Kātaka's voice warned her father (the tohunga Tāne-atua) not to eat fruit from the tree, he named the tree Te Iho-o-Kātaka and made a karakia over it. It gained the reputation of aiding childless women to conceive. Subsequently, other people began to leave iho there, wrapped in aute, or sweet scented *raukawa* (*Raukaua edgerleyi*) (Gudgeon, 1906: 32-33; Anon, 1939: 6).

However, one of the most important uses of aute was in making *manuaute* (bird aute). Kite flying was traditionally held in great esteem, featuring in legend and enabling men to reach the heavens. Some kites could only be flown by chiefs and tohunga. Of the numerous kite varieties, aute was used to make the most valuable (Tregear, 1904: 239). None have survived but one tribal account provides a description. The *mānuka* (*Leptospermum scoparium*) framed body and wings were wrapped with barkcloth; a top-knot of feathers dressed its head. When it was taken to be flown the entire community came to share the occasion. Two men would fly the kite; they had to be of high status and wear prestigious garments. One lifted the kite, the other held the string. When the kite first took off, it would dart at people making them jump, before it climbed skywards when the crowd cheered and chanted an incantation to help it fly higher (Pio, 1901). Sometimes, other forms of kite had a head wrapped with aute (Walsh, 1912: 377); probably the largest form was the *manu kāhu* (harrier-hawk kite), which was about 1.5 metres high with a wingspan of 3.6 metres, and required many men to launch it.

Barkcloth in the South Island

Several archaeological remains retrieved from rock shelters and clefts within the Otago region included elements of barkcloth. Their histories unknown, they probably belonged to the late prehistoric era, 1550-1800 (Anderson, 1982: 69-72). But they raise questions. Aute is not known to have grown in the South Island. No barkcloth beaters have been found there. Were these local hoheria barkcloth or aute from the North Island? Furthermore, some discrepancies occur between reported findings and museum holdings.

Nonetheless, two discoveries stand out. A plain *waka huia* (wooden treasure box) wrapped in barkcloth, was found in 1933 (Otago Museum Register number: D33.1892; see Figure 1). It was enveloped in a protective outer covering of finely woven flax and tied with two-ply flax string. Inside the waka huia was a tapa lining with 70 highly valued *huia* tail feathers, 20 red *kākā* feathers, and a 150mm wooden awl, its head wrapped with pieces of both white and brown tapa (Neich, 1996: 122-123). The very soft, creamy brown, single layered barkcloth that wrapped the box is considered potential aute rather than hoheria (Rowley, 1966: 75; Neich, 1996: 123) and possibly also the inner lining. Now extinct, huia birds (*Heteralocha acutirostris*) were not found in the South Island, although there are two sub-species of kākā (*Nestor meridionalis*), one each in the North and South Islands. But perchance significantly, the wrapping of the awl includes the first mention of coloured tapa in Aotearoa.

In 1951, some small perished pieces of barkcloth were found following the discovery of a so-called ‘medicine bundle’ (Skinner, 1952: 130-135). Folded dogskins enclosed a skull-bowl containing sprigs of *koromiko* tied with human hair, while a flax kit held *Nestor* sp. feathers with a lock of black human hair. Koromiko (*Hebe salicifolia,* now known as *Veronica salicifolia*) was used for a variety of medicinal purposes. The location of the tapa fragments is now unknown, but combined with the elements of human skull and hair they raise the question – were these items links with some particular ancestor or atua?

Figure 13.1. The most significant piece of extant Māori barkcloth is part of this unique cache discovered in a rocky outcrop near Talla Burn in Otago. Registered as Otago Museum D33.1892d (shown second from left) this sandy-fawn coloured piece of barkcloth measures 130cm by 24cm. The texture is described as 'smooth and homogeneous with long-grained fibres crossing at a regular low angle' (Neich, 1996: 123). The use of a barkcloth wrapping signalled the importance of the contents of this waka huia. White-tipped black tail feathers of the huia are still highly prestigious. The proximal end of the wooden awl (D33.1892f, shown at extreme right) is padded with a layer of white barkcloth, over-wrapped with a dark brown barkcloth strip. However, the significance of an awl made from wood, as opposed to bone, is currently unknown and requires further research.

The decline of aute

The decline of aute in Aotearoa may have been influenced by a number of factors. While it was recorded that in former times there were large plantations of aute, apparently the shrubs never grew to a large size (Tregear, 1904: 239). Cook's comment that 'this plant must be very scarce among them' suggests that by the late 18th century aute had already become rare. But being indigenous to south-east Asia, *Broussonetia papyrifera* does well in temperate climates. Both male and female plants are required for viable seeds, but the species requires a marked seasonal climate with a cool winter in order to flower successfully (Wilcox, 2004). Fast-growing, up to 12m tall, it reportedly coppices well and regenerates rapidly, readily forming new stems from the rootstock when the main stem is harvested (Whistler and Elevitch, 2006: 5). In the tropical Pacific Islands, all the transported trees are female. Consequently, the Polynesian cultivation method of vegetative propagation using root shoots or cuttings, always produced female clones (Peñailillo et al., 2016). One plausible explanation offered for the failure of this canoe plant to thrive in Aotearoa New Zealand suggests that during its long history of travelling through the tropical Pacific it underwent selection pressures that lost the cold-resistance which the species has in its natural area of origin (Harris and Heenan, 1992: 261).

The first decades of the 19th century ushered in tremendous change in traditional ways of life as Māori began to interact with the transformative forces of Eurocentric civilisation. The introduced aute had failed to flourish effectively and the once highly valued cultivar fell into decline. Small isolated plantings were seen at Whangaroa and Mangamuka as late as 1839 (Tregear, 1904: 239) but the last reported sighting was at Hokianga in 1844. The Ngā Puhi leader Eruera Maihi Patuone sent cuttings of this at the request of his friend Colenso, and wrote that the plant there was nearly totally destroyed by the cattle of the Europeans (Colenso, 1880: fn.18). The cuttings did not survive. By the late 19th century the aute of the ancestors had become extinct in the Māori world.

14

'Ahu Sistas: Reclaiming History, Telling our Stories

Pauline Reynolds, Jean Clarkson

In 1808 a passing sealing ship 'discovered' a settlement on Pitcairn Island, which had been hidden from the world since the infamous ship HMS *Bounty* had disappeared from Tahiti's shores in 1789. Pitcairn had been settled by the missing nine mutineers along with eighteen Polynesians (twelve women and six men) and a baby girl. From that first visit in 1808, the surviving women, their daughters, and later their granddaughters, offered gifts to visitors to the island, mostly comprising large amounts of tapa. These gifts have become the primary sources of information about these women who, because of an ongoing obsession with the mutineers, are almost completely invisible in the written historical record (Reynolds, 2017). This paper outlines reflections by the 'Ahu Sistas on the tapa made by their foremothers on Pitcairn. The Sistas are Meralda Warren (from Pitcairn Island) and her Norfolk Island cousins Sue Pearson, Jean Clarkson and Pauline Reynolds. These reflections include the ways in which the cloths connect the 'Ahu Sistas to those women and how, both collaboratively and individually, these connections have been incorporated into creative practices and academic pursuits.[1]

The *Bounty* story, including the mutiny and its aftermath (the settlement of the mutineers in Tahiti and Pitcairn Island, as well as Lieutenant William Bligh's epic voyage to Timor) has been rewritten and reimagined in thousands of publications as well as on film in major Hollywood movies and documentaries. The narratives invariably focus on the tensions between men – on board *Bounty* as well as on Pitcairn – so that any female agency is discounted. The 'Ahu Sistas have worked over the years to underline the twelve Polynesian women's essential roles in establishing the settlement on Pitcairn and their ongoing influence on their descendants today.

Of the twelve women taken to Pitcairn on the *Bounty*, six had children on the Island. In the first decade of settlement, five of those women died. By 1817, only five women remained (they were from Tahiti and Huahine in the Society Islands, and Tupua'i in the Austral Islands). The making of tapa and the education of the first- and second-generation

1 'Ahu is an old Tahitian word for tapa, barkcloth, today used in Tahiti and her islands for 'cloth' and 'clothing'.

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Pitcairn girls was guided by these women of different origins. Their knowledge, and the practices that evolved, were very likely representative of the techniques of each of these islands. The women used *aute* (paper mulberry, *Broussonetia papyrifera*), *'uru* (breadfruit, *Artocarpus altilis*), and possibly *'ōrā* (banyan, *Ficus prolixa*) to produce a large array of different textures of tapa: from fine white cloths, to gauze-like *'ahufara* shawls that were worn by the elite on Tahiti (D'Alleva, 2005: 48; Reynolds, 2008). There were dyed *pareu* sarongs that resembled modern-day twill and when worn, had a comfortable 'give', and other fabrics that held a sheen and weight not unlike raw silk. One striking item of clothing made by the first generation of girls was a series of *tiputa* ponchos or tunics that appear to have been assembled in the 1820s. These were made from several layers of different kinds of tapa, different colours (from deep reddish-brown to bright rich yellow), and different shapes. Alongside the 'ahufara and other articles made of fine white cloth, the tiputa were also considered a luxury item of clothing in Tahiti, reserved for chiefly families and priests (Moerenhout, 1993: 343). However, the tiputa of Pitcairn were unique: their design was highly stylised, shorter than contemporary Tahitian examples, and apparently constructed together on a kind of production line so that each one, although similar, had small individual additions (Reynolds, 2016: 199).

By 1832 only two of the original *Bounty* women were still alive, Mauatua and Teraura, who lived to 1841 and 1850 respectively. Their influence on the tapa making process was remarkable, and many pieces of cloth they made together are now held in museums in Europe. The recovery of those women's voices and the creation of a new narrative focusing on their story began 25 years ago with a chain of events that led to an eventual artistic and academic awakening for the 'Ahu Sistas. In 1994, Jean Clarkson was commissioned to create a large permanent installation to celebrate the opening of a new Galleria in the Parliament Buildings in Wellington, Aotearoa New Zealand. While conducting research for what would become the celebrated *Pacific Panels*, she came across a copy of Simon Kooijman's *Tapa in Polynesia*, which contained a chapter on tapa made on Pitcairn (Kooijman, 1972: 90-92). This amazing discovery was a seminal moment in the design process for Jean's artwork. Inspired by the knowledge of these ancestral tapa and designs, Jean went on to create her *Prince of Peace* costume that won the 1996 Traditional Section of the Pasifika Fashion Awards in Aotearoa New Zealand.[2]

By this time, Sue Pearson had opened the quintessential gallery Aatuti Art on Norfolk Island which allowed her to explore her fine arts practice full-time expressing her love of culture and the natural and political environment of Norfolk Island. Longing to further extend this expression and gain an understanding of her Polynesian foremothers, in 1996 Sue travelled with Pauline Reynolds to Tahiti and Huahine in French Polynesia. They had each experienced the influence of these women in their culture, language, and their individual creative expressions, but mention of these women in written history was almost non-existent. Sue and Pauline explored different methods of research, some of them outside standard western approaches. These included searching genealogies, oral histories, recording language, and exploring cultural activities such as weaving and cooking. During their time in French Polynesia, they were struck by the number of Tahitian words in their own Norf'k language, and similarities in aspects of culture and place.

2 Today the work is held in the Museum of New Zealand Te Papa Tongarewa, Pacific Cultures Collection, reg. FE012022, https://collections.tepapa.govt.nz/object/726475.

Sue returned to Norfolk and extended her printing practice to include techniques inspired by her time away, and Pauline settled on Huahine. From there, Pauline contacted museum curators around the world hoping to find more examples like those at the British Museum in the Kooijman chapter discovered by Jean. When the first responses came through, Pauline was struck by the transnational nature of this kind of research: living on Huahine where To'ofaiti, one of the *Bounty* women, was born, she was locating (over the internet) gifts of tapa made to European and American visitors to Pitcairn, that today are found in museum collections around the world.[3] Inspired by the colours of the historic tapa she had located, she foraged for barks and flowers, combed the shorelines for wild *nono* trees (*Morinda citrifolia*), pulled up their roots, and grated and boiled them to produce shades that ranged from bright orange to golden yellow in which silks were infused, replicating the colours on the underside of the yellow sections on the original Pitcairn tiputa. Over these dyed fabrics she printed her husband's Tahitian *tatau* (tattoo) designs for pareu and 'ahufara with block-printing techniques learned from Sue and screen-printing techniques from Jean.

The discovery of a relatively extensive Pitcairn tapa collection at the British Museum led to the formation of the 'Ahu Sistas collective. The first priority was to ensure the ongoing care and documentation of historical Pitcairn tapa. The second was to ensure the authentic representation of the cloths, and to deconstruct the ongoing cycle of non-descendants narrating the Sistas' family history. The third objective was to encourage the revival of tapa making among the descendants of the original *Bounty* women. This diaspora is today spread across the globe, centred mostly on Pitcairn, Norfolk and Tahiti.

Meralda Warren's voice was powerful and essential to the group's conception. She is an artist, poet, author and musician who has been Pitcairn Island's cultural teacher for many years. She was the first Pitcairn Islander to revive the practice of making tapa since it was stopped by missionaries in the 1940s. Sue sent Meralda a wooden *e'e* (Pitkern name for tapa beater).[4] It was based on the shape and size of a whalebone e'e that had been in Meralda's family for many generations and believed to have been owned and used by her foremother Mauatua (who is a common ancestor for each of the 'Ahu Sistas). The first act of stripping back the bark of an aute tree planted by her mother Mavis marked the beginning of Meralda's new arts practice. According to Mavis, it was something Meralda was destined for, that she was 'reliving a dream she'd always had. It was always something she wanted to do'.[5] Meralda's experimentation was pivotal and symbolic of the way the Sistas approached their study of their foremothers' lives; working intuitively, and with scanty information from books sent to her by Jean and Pauline, she experimented and consulted the female elders of the community for any information they could remember from the old days. These elders reported watching their mothers, aunties and grandmothers secretly beating bark as they chanted songs, hidden from the missionaries and their regulations.

The first time the 'Ahu Sistas met as a group was on Tahiti in 2008, on the 220th anniversary of the *Bounty*'s arrival in Matavai Bay, at an exhibition and book launch held

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3 In this essay, we sometimes call the Polynesian women who arrived at Pitcairn in 1790 the *Bounty* women. This avoids calling them all (as is usually done in the literature) Tahitian; they were from Tahiti, Huahine and Tubuai. It is also a way of claiming the word '*Bounty*'.

4 Note 'Pitkern' and 'Norf'k' indicate the Pitcairn and Norfolk Island languages; also note the different spellings and pronunciation for tapa beater: e'e or *e'ei* in Pitkern and *i'e* in Tahitian.

5 Personal communication, 2018.

Figure 14.1. Meralda Warren, *New View of Petroglyphs* (doodwi and nanu dye on 'uru tapa), 2008.

at the Arue Town Hall. Meralda travelled from Pitcairn, Sue and Jean from Aotearoa New Zealand, and Pauline from Huahine. This was the first exhibition of its kind, bringing the *Bounty* women's story to the fore. It featured Islanders recounting their own history, and women telling women's stories.

Meralda's innovative and ground-breaking work featured in the exhibition. She had produced lengths of tapa decorated with dyes depicting scenes from Pitcairn. One of her most spectacular large pieces showed the ancient petroglyphs carved into the cliffs left by early Pacific voyagers long before the *Bounty*'s arrival (Figure 14.1). Meralda later spoke about her excitement in finding new techniques: 'I discovered how to make natural dyes from *doodwi* (candlenut) bark, from smoke from burning the doodwi nut, and from the root of the nano [Pitkern pronunciation of nono]. All this is very exciting for me, knowing that my foremothers were making this process 200 years ago' (Clarkson et al., 2008: 2).

For the same exhibition (Figure 14.2), Sue contributed a series of woodblock and photographic relief panels printed on kozo paper titled *'Ahu Sistas*.[6] Jean and Sue's

6 Kozo paper is a Japanese paper made from *Broussonetia papyrifera* – the same plant used for making one kind of Pacific tapa.

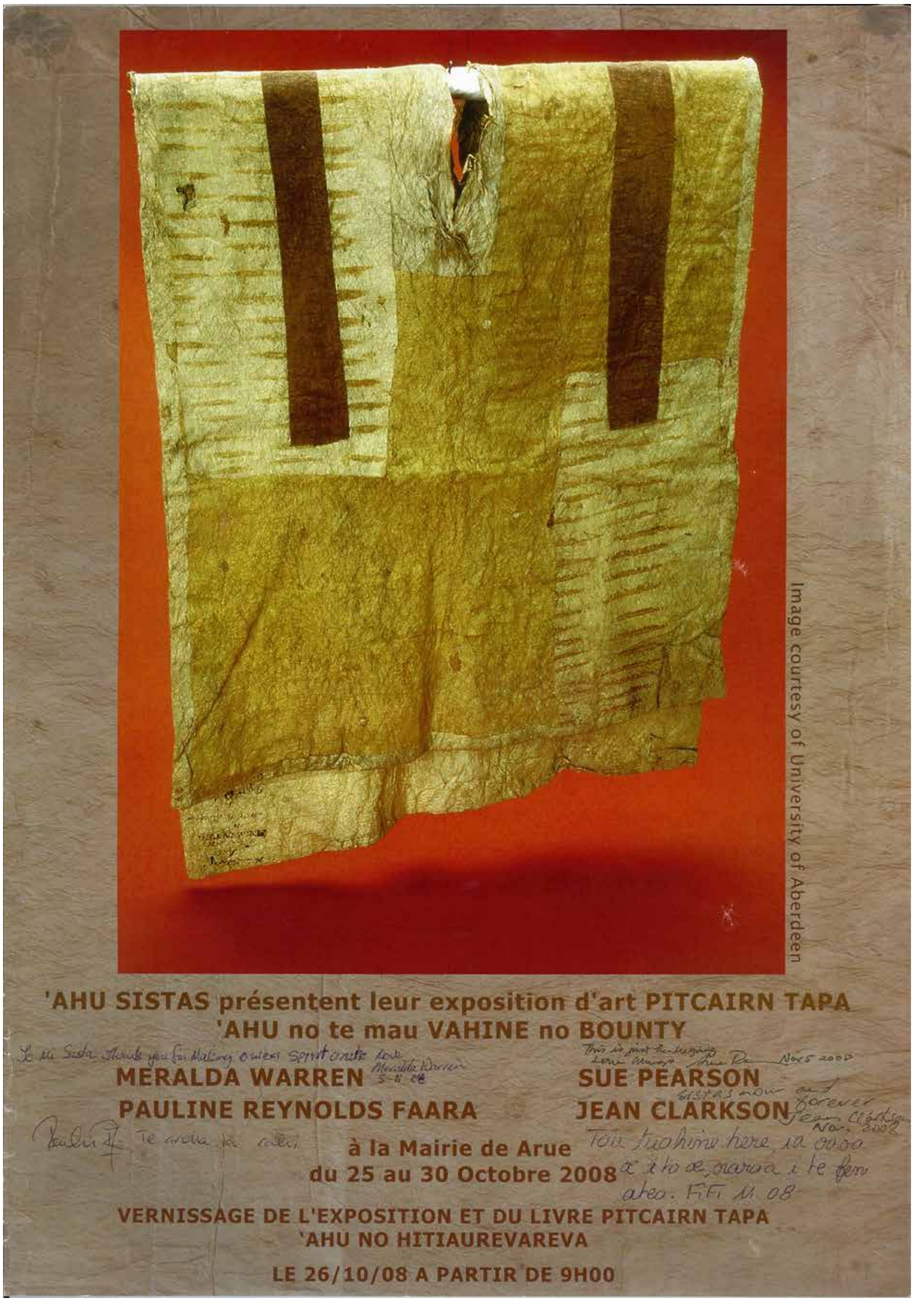

Figure 14.2. 'Ahu Sistas exhibition poster, *Pitcairn Tapa 'Ahu no te mau Vahine no Bounty*, Town Hall, Arue, Tahiti, October 2008.

installation *Hei Upoʻo*, woven headpieces made from silkscreen-printed fabric and paper, floated above the gallery space and invoked the presence of those twelve foundational women. Jean's individual artworks were achieved through linocuts, engravings, drawings and silkscreen prints on tapa and paper. A key artwork was Jean's print on tapa of the names of the women. For many of the descendants present, this was the first time they had seen and read all of the women's Polynesian names in one place. The names are also listed in Pauline's book *Pitcairn Tapa: ʻAhu no Hitiaurevareva* (Reynolds, 2008), which was launched by Nancy Hall, daughter of the author James Norman Hall, whose home and museum is close by.[7] Nancy's gracious support closed a circle from the romanticising of the *Bounty* story to the Sistas' work of deconstructing and reconstructing their family story.

Opening the exhibition, the Mayor Philip Schyle addressed the many descendants from Norfolk Island, Pitcairn Island and Tahiti:

> Perhaps they have preserved our Polynesian traditions better than we have here in Tahiti and French Polynesia…This is a source of pride and joy because they are our cousins. The *Bounty* moored in Arue lagoon, just in front of here. This story is handed down, about the historical relationship between us and you…the descendants of both the *Bounty* mutineers and the 12 Tahitian women. These are the bonds between us: family ties and historical links. So I say again, you are at home here (cited in Baysting and Baysting, 2009).

Following the celebrations, the Sistas travelled to Pauline's home on Huahine and Meralda demonstrated how to make tapa from the *tumu ʻuru* (breadfruit tree, *Artocarpus altilis*). On this occasion, a young branch from a tree in the backyard was chosen. The general method for a fresh beat is this: the branch is scraped of all the rough outer bark, until the soft spongy inner bark, or bast, is exposed. An incision is then made the entire length of the branch, and it is pulled away with much effort from the inner wood. The bast is then beaten until the fibres spread. Another method involved the fermentation of the bast, which was then beaten. A few months later the Sistas held the exhibition again on Norfolk Island.

To enable her continued engagement with museum collections, Pauline received a Churchill Fellowship in 2010 to visit and study historical Pitcairn tapa in museums in Aotearoa New Zealand, Hawaiʻi, Britain, and Norway.[8] The following year, Meralda received a Commonwealth Connections International Arts Residency Award to allow her to work with other tapa makers from around the Pacific. So she travelled to Aotearoa New Zealand (a commitment that includes many days of travel by ship and plane), and while there she was the keynote speaker at the Māori and Pacific Textile Symposium held at Te

7 With Charles Nordhoff, James Norman Hall published the *Bounty* trilogy: *Mutiny on the Bounty* in 1932, *Men Against the Sea* in 1933, and *Pitcairn's Island* in 1934. The home museum can be viewed at: http://www.jamesnormanhallhome.pf/.

8 Museums visited were Museum of New Zealand Te Papa Tongarewa, Bishop Museum, British Museum, Cambridge Museum of Archaeology and Anthropology, Kew Gardens, Pitt Rivers Museum, Liverpool World Museum, National Museum of Scotland, King's Museum, Kon-Tiki Museum. Her report can be accessed from: https://www.churchilltrust.com.au/fellows/detail/3510/pauline+reynolds-barff (Reynolds, 2010).

Papa Museum.[9] An exhibition of Meralda's art was held at the residence of Vicki Treadell, the British High Commissioner to New Zealand and Samoa, and Governor of Pitcairn Island. Following this, Meralda's remaining tapa were put on display at the Norfolk Island Museum including a carefully fabricated vest made entirely from tapa (Reynolds, 2011). A flow-on effect was created with these events. During the conference and exhibition in Wellington, the group had met Pacific scholar Teresia Teaiwa, who invited Pauline to be a guest lecturer for her Comparative History in Polynesia class at Victoria University, in what has become a feature of the group's purpose and motivation: outreach and dissemination of information in a multitude of ways. Meralda's dedication to teaching and sharing culture especially for the next generation was highlighted when she organised an exhibition in the Pitcairn Town Hall, showing the tapa made by the school's pupils under her tutelage (Warren, 2013).

Collaboration has also featured in the Sistas' work. In 2014 Sue and Jean exhibited their artwork *Hei* – a relief print, screenprint, and intaglio installation in the *Printmaking: Beyond the Frame* show at Tauranga Art Gallery.[10] In 2017 Jean and Pauline assisted with an Honours seminar including a workshop and presentations at Sydney University. Just prior to this, Pauline was invited by the Pacific Presences Project to travel to Britain and explore Pitcairn artefacts, from which she was inspired to produce a replica tiputa using some of the nono-dyed silk she had produced on Huahine and other modern fabrics (Reynolds, 2018). This interactive engagement with historic clothing enabled her to understand the construction and careful attention to detail in creating the original tiputa. During the Pacific Presences trip, Pauline was reunited with many of the tapa she had previously studied in 2010. One of the many highlights was a visit to the Centre for Textile Conservation and Technical Art History in Glasgow where fragments of cloths made by the Sistas' foremothers Mauatua and Teraura (that are part of the Economic Botany Collection at Royal Botanic Gardens, Kew) were undergoing conservation treatment. For Pauline, it is imperative to keep a connection with the historic tapa today held in overseas collections, because they represent and hold the essence of her ancestresses. They *are* therefore the ancestresses, and access to them is essential for ongoing cultural and spiritual connection.

In late 2017, Jean's participation in the Auckland War Memorial Museum Tapa Symposium allowed her to discuss with other Pacific artists how contemporary arts practices are inspired by tapa. Then, after almost ten years, the ʻAhu Sistas exhibited together again at the *South Pacific Literature and Language Conference* exhibition in Sydney early in 2018. Later in that year, Pauline received an Indigenous Seed Grant from the University of New England, Australia, to travel to Hawaiʻi and study with well-known kapa masters. She later shared this knowledge with Jean and Sue, and with other descendants on Norfolk Island.

To further celebrate the ten year anniversary, a major exhibition was held at Te Kōputu a te whanga a Toi (Whakatāne Museum and Arts Centre, Aotearoa New Zealand) from December 2018 to February 2019. It featured six of Meralda's original tapa artworks, and collaborative works by Jean and Sue (Figure 14.3): these included eight life-size collograph

9 The full conference name: *Māori and Pacific Textile Symposium: Whatu Raranga a Kiwa: Understanding and Uniting Māori and Pacific Textiles*. Meralda was the keynote speaker, and Pauline also presented on the same day (Reynolds, 2012).

10 Further details of the installation can be seen at: *Discussion Summary: The Future of Printmaking in NZ,* 26 July 2014, http://www.nzprintmakers.com/2014/07/.

prints based on real Pitcairn and Norfolk Islanders. There was also a multimedia installation with printed paper shaped after the original Pitcairn designs, along with lengths of tapa made from Sue's Whakatāne garden. Pauline, Sue and Jean all participated in a collaborative talk for a public event at the end of the exhibition.

For each of the 'Ahu Sistas, engagement with history through creative and scholarly explorations has led to new approaches in depicting and understanding their foremothers. The deconstruction of the traditionally accepted accounts of culture and history in literature and film has created fresh space for the reconstruction of another, truer, fuller narrative, bringing to the forefront the women who were instrumental in constructing the new society from which each of the Sistas descend. The Sistas' processes of intuitive arts practices, experimentation and historical study have been fundamental in assuring ongoing tapa practices and the creation of new artworks. Each Sista has worked, in her own way and in collaboration, towards bringing new life into the practice of tapa making as a way of accessing the past, present and future.

Figure 14.3 (left). Jean Clarkson and Sue Pearson installation *Orl dem lorng fe aklan (All the stories about us)*, Te Kōputu a te whanga a Toi (Whakatāne Museum and Arts Centre), 2018.

~ Plant Profile 11: Yellow dye ~

Turmeric *Curcuma longa* L.
ZINGIBERACEAE

Mark Nesbitt

Left: Plant at Pali o Waipio Huelo, Maui, Hawai'i.
Right: Lynwood Hume 412, 1989. Kauai, Hawai'i. Cultivated on farm (National Tropical Botanic Garden, PTBG1000037586).

Turmeric was first taken into cultivation in Asia, probably in India where it is a well-known spice plant, then spreading throughout Polynesia with the first settlers. The plants are perennial and grow up to one metre high, with large leaves and spectacular flowers. It is easily propagated by breaking off and planting its bright orange roots (rhizomes), and is found both in cultivation and naturalised in low altitude forest. The rhizomes contain essential oils and a range of medicinally active chemicals. These include three related molecules, curcumin, demethoxycurcumin and bisdemethoxycurcumin, which are the main components of a bright yellow but light sensitive dye. Chemical analysis has confirmed that this is widely used on historic barkcloths. The dye remains in use, for example in Samoa, and is extracted from the grated rhizomes with water and collected as a sediment from the solution. It is applied to tapa mixed with water, and mixed with oil as a body paint (Chapters 5, 6, 11). Kooijman (1972: 466-8) proposes that the dye species is usually *C. viridiflora* Roxb. However the distribution of this species is limited to southeast Asia and it is a very unlikely candidate.

Vernacular names (selected): western Polynesia: *ango*, or closely related terms *e.g.* Tonga: *ango*; Samoa: *ago*; Fiji: *cago*; eastern Polynesia: words based on *lenga* (yellow), *e.g.* Cook Islands: *renga*; Hawai'i: *'olena*.

~ Plant Profile 12: Yellow dye ~

Noni *Morinda citrifolia* L.
RUBIACEAE

Mark Nesbitt

Left: Trees at Hoolawa Farms, Maui, Hawai'i.
Right: David H. Lorence 9705, cultivated at National Tropical Botanical Garden, Kauai, 2008 (National Tropical Botanic Garden, PTBG1000021205).

Noni is native to Indonesia and Australia, and possibly to western Polynesia. It is an ancient introduction to eastern Polynesia. It is cultivated from seeds or cuttings, and is also naturalised in coastal forests on many islands. It is a shrub, growing to 6 metres, with a faceted, knobbly fruit that is foul-smelling when ripe and not a favoured food. Noni's importance to Pacific islanders is rather as the source of diverse medicines, and as the source of one of the two most important yellow dyes for barkcloth, second only to turmeric (Plant Profile 11). It was used as a dye in Samoa, 'Uvea, the Society Islands, Austral Islands, Cook Islands and Hawai'i (Chapter 5). The roots are peeled, grated and wrung out to make a yellow solution. Reports of the production of a red dye from noni are less well-documented (though see Flowers et al., 2019; Chapter 5).

Vernacular names (selected): Tonga, Samoa, Niue, 'Uvea: *nonu*; Cook and Society Islands: *nono*; Hawai'i: *noni*; Fiji: *kura*.

15

'Tataki 'e he Leá: Guided Language'

Tui Emma Gillies, Sulieti Fieme'a Burrows

Tui Emma Gillies and her mother Sulieti Fieme'a Burrows are award winning tapa artists from Aotearoa New Zealand. Their work is a collaboration; Burrows, who grew up in Tonga, had carried on the craft of tapa making since moving to Auckland in 1978 and, like her own mother, has passed on a deep understanding of the artform to her daughter. Gillies grew up surrounded by *ngatu*, Tongan tapa cloth, painted by her maternal grandmother Ema Topeni, which covered the walls and ceiling of her bedroom, the inspiration for her own painting on tapa.

A trip to a family funeral in Auckland transformed the pair's art practice. The experience gave Gillies the opportunity to learn more about her family in Vava'u and to explore the Tongan side of her ancestry, so that for the first time, she felt at home with the Tongan side of her family and her own Tonganness. This experience inspired a trip to Falevai in Vava'u, in 2014, Gillies' first visit to Tonga, funded by a Creative New Zealand grant. The pair wanted to build on Burrows' lifelong experience of making tapa and their shared artistic practice to revive the art of ngatu making in the village. Tapa making had not been practised in the village for several decades, and even the mulberry trees had disappeared from the island. They felt as though Burrows had taken a torch of skill and knowledge from Falevai and had managed to keep the ember burning all the time she had been away. What's more, she had passed on the flame of ngatu creation to Gillies. They felt that it was time to bring the torchlight back to its source and to re-light it in Falevai.

Local women in Falevai were very keen to be involved in the project to create two large ngatu. The smaller of the two ngatu created (Figure 15.1) depicts the fafine or group of women working on the ngatu. The cloth is laid over the *papa koka'anga*, the work table which resembles a large log split down the middle. Falevai village's papa koka'anga had been gathering dust in an abandoned house for many years. It was carried by a group of local men to the community centre where the work was done. They also foraged for the coconut leaves, the spines of which were used for the *kupesi* panels (pattern rubbing boards), and *manioke* (tapioca) used for glueing the barkcloth. Gillies sketched the designs and Burrows showed the group of women how to sew coconut-leaf-spines onto the kupesi material. The kupesi panels were then used to transfer the motifs onto barkcloth. The group worked together to rub dye over the kupesi designs to make print impressions. Once they returned to Auckland, Burrows and Gillies hand-painted the ngatu.

in: F. Lennard & A. Mills (eds) 2020: *Material Approaches to Polynesian Barkcloth. Cloth, Collections, Communities*, Sidestone Press (Leiden), pp. 203-207.

Figure 15.1. Tui Emma Gillies, Sulieti Fieme'a Burrows, *Koe Koka'anga 'ae Fafine Falevai* (barkcloth, ink), 2014-2016.

Figure 15.2. Tui Emma Gillies, Sulieti Fieme'a Burrows, *Falevai Moe Fāmili* (barkcloth, ink, acrylic), 2014-2018.

The second, larger, ngatu features Gillies' first impressions of her mother's home village, and themes of the importance of family (Figure 15.2). It also recalls a Falevai legend, which describes how a beautiful woman used to bathe on a rock in the sea; men in their boats would see her, and try to get closer. They would be so busy admiring her beauty that they would run aground on the reef of the nearby island of A'a, at which point the woman would disappear. She was known as a ghost of Falevai.

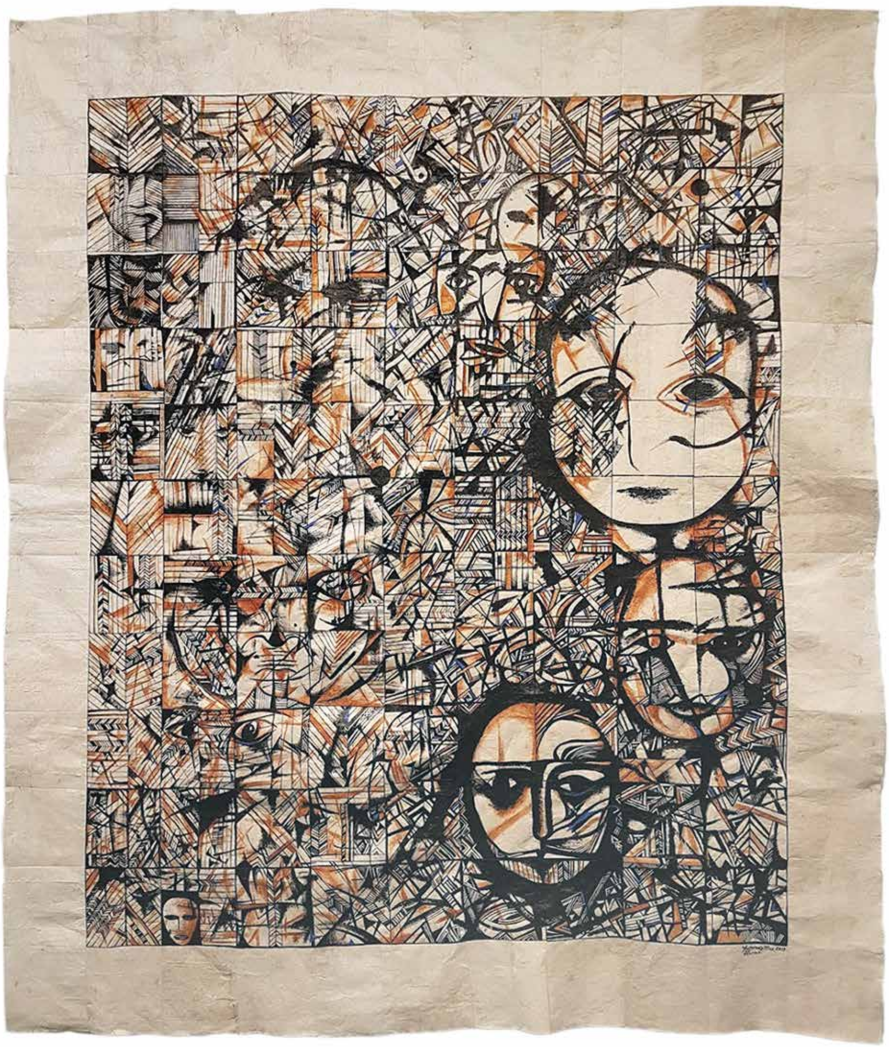

Figure 15.3. Tui Emma Gillies, Sulieti Fieme'a Burrows, *Ko 'etau Fanga Kui* (barkcloth, cotton thread, ink, acrylic), 2018.

The work had an ongoing legacy – for the villagers in Falevai, who set about planting mulberry trees to harvest from them in the future – and for Burrows and Gillies. In 2015 they travelled to Europe to present and to show the two ngatu at conferences at the Museo de América in Madrid and The University of Vienna. In 2017 they travelled to the Festival of Quilts in Birmingham, England, to exhibit their work and hold workshops and they spent two weeks in Hawai'i in 2019, sharing their knowledge with kapa artists there. Meanwhile, when they returned to Falevai in 2018, they were able to beat out bast taken from the paper mulberry planted in 2014 to make cloth. The two ngatu were exhibited during the Auckland Art Festival in 2018, and then purchased by the Auckland War Memorial Museum. Gillies and Burrows were awarded the 2018 Creative New Zealand Heritage Art Award in recognition of the significance of this work.

The work *Ko ʻetau Fanga Kui* (*Our Early Ancestors,* Figure 15.3) was created in response to these experiences. Burrows has always used her sewing skills to help provide for her family and after her international experiences, she had the idea of combining Tongan and European creative influences by sewing a patchwork ngatu, made up of multiple tapa squares. Gillies used the squares to create a work inspired by Malaspina's Carpet, the oldest intact piece of barkcloth in the world, dating from 1793, part of the collection of the Museo de América in Madrid which Burrows and Gillies viewed during their visit (see Chapter 9, Figure 9.2). Research on Malaspina's Carpet indicates that it may have in fact been made in Falevai. The artwork is designed with a tight weave-like pattern. What struck Gillies most was that the carpet seemed to contain many faces looking out from behind the weave; she felt they were the faces of the people who had originally painted the ngatu, probably her ancestors.

Since their research visit, Gillies has incorporated the impressions of that day into many of her works. Her latest piece is grounded in her interest in petroglyphs and pictographs, inspired by a Werner Herzog documentary about cave drawings in France, and explores pre-European spirituality and visual language (Figure 15.4). It is underpinned by her belief in ancient wisdom. While she collaborated with her mother, Burrows, on this piece, she feels that her Tongan ancestors guide her when she paints. Whilst she says that this process is often challenging, it lifts her work to levels she could not otherwise achieve. *Tataki ʻe he Leá* (*Guided Language*) is a bridge between the present and all the generations that came before her, her 'DNA turned into art'. A combination of contemporary and traditional materials were used on this piece, reflecting the mother-daughter partnership. Burrows painted designs based on traditional kupesi patterns for her panels while Gillies used acrylic paint in blue and white for her part of the design. The pigments include the traditional *umea* (clay), which came from Vavaʻu; its organic qualities, which show the artists' fingerprints, create a tangible connection to Tonga. The Indian ink, while not traditional, is 'the colour of Tonga'.

Gillies and Burrows' unique partnership responds to the tradition of ngatu making in Tonga, drawing on Tongan culture and revitalising it, making it relevant to today's multicultural world. Their work has also been important in disseminating their love of tapa and its contemporary significance internationally and has turned them into ambassadors for Tonga. As well as inspiring the revival of traditional barkcloth making in Falevai, they lead workshops internationally; they found that students at a girls' high school in Auckland were curious to learn more about Tongan art and culture, while audiences at the Festival of Quilts in England were interested in learning, not just about tapa art, but more about Tonga itself.

Figure 15.4 (right): Tui Emma Gillies, Sulieti Fieme'a Burrows, *Tataki 'e he Leá* (barkcloth, Indian ink, *umea* (clay) from Vava'u and blue and white acrylic paint), 2019.

PART III

TAPA IN COLLECTIONS AND THE COMMUNITY

16

The Hunterian's Polynesian Barkcloth Collection

Andy Mills

Tapa cloth offers a good field of collections history research, for a few key reasons. First, Polynesian barkcloth collections are usually discrete, modest in scale (here I treat just under a hundred objects) and it has recently become straightforward to stylistically attribute geographical origins to them. Second, textile collections exhibit *redundant partibility*: fabrics have been cut up repeatedly, into ever-smaller pieces which were distributed from one collector, dealer or museum to another. The value of barkcloths for 18th- and 19th-century western collectors lay neither in their overall size nor their holistic integrity as unitary artworks, but rather in their heuristic value as tokens of ethnicity or exemplars of industry. Tapa are, however, handmade products, and often possess unique or rare decorative schemes that can be matched up across different collections. Samples cut from larger cloths retain at least one edge dimension the same; cut edges are rarely straight, and their undulations may be matched up. Subdivision inscribes a certain artefactual genealogy in formal traits, and therefore I speak here of *parent*, *child* and *sibling cloths (*superordinate, subordinate and parallel components within the operational sequence of the original artefact's incremental subdivision). Third, a useful collections history resource here at the University of Glasgow's Hunterian Museum and Art Gallery (hereafter The Hunterian) is the retention of some hundred *Detached Ethnography Labels*; analysis of labelling practices is generally very useful but progressive accumulation of dirt over time means that many textiles bear cleaner 'label shadows' which can be matched precisely to former attachments. These additional tools enhance conventional collections history work and enable us here to model The Hunterian's Polynesian barkcloth collection with improved clarity.

General synopsis

The Hunterian's earliest Pacific artworks date to the founding collection, which was the private museum of Lanarkshire-born Dr William Hunter (1718-1783; Figure 16.1). Beyond his remarkable career as royal obstetrician to Queen Charlotte and the foremost teacher of anatomy in Britain, Hunter was one of the great Georgian collectors (Hancock, Pearce and Campbell, 2015; Campbell and Flis, 2018). Keppie (2007: 25) remarks that, when Hunter died in London on the 30th March 1783, the private museum he bequeathed to the University

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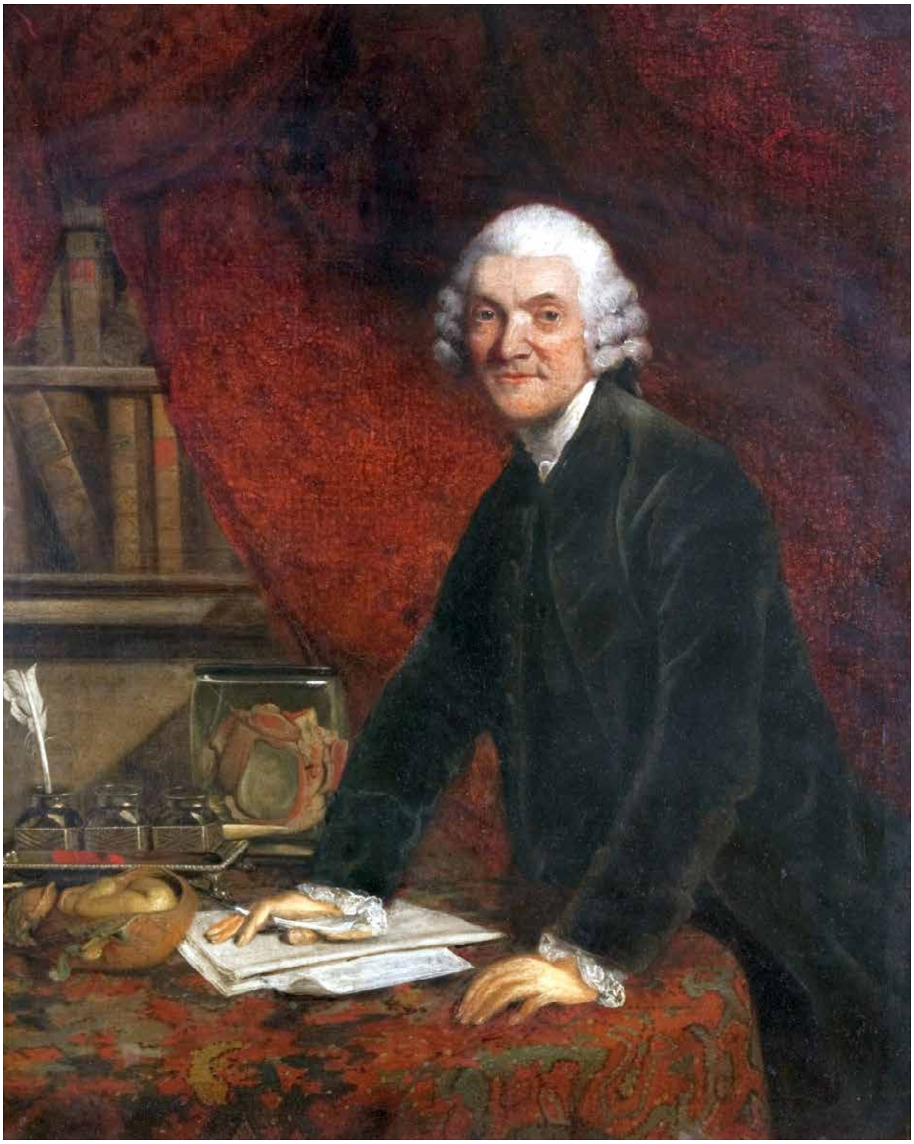

Figure 16.1. *William Hunter*. Joshua Reynolds, circa 1787 (The Hunterian, GLAHA:43793).

of Glasgow 'consisted of some 30,000 coins and medals, 10,000 books, 650 manuscripts, 7,500 insects, 1,500 minerals, 3,000 anatomical specimens, 5,000-6,000 shells and 200 "South Seas Curiosities".' Of these 200-some 'curiosities', several originated on the Pacific coast of North America, and a quarter were weapons. Hunter's will stipulated that the collection should remain in the apartments above his anatomy school on Windmill Street, Soho for 30 years in the care of his nephew Dr Matthew Baillie and two other trustees: the physician Dr George Fordyce and the numismatist Dr Charles Combe. The University of Glasgow's Principal Leechman was dismayed to learn in 1783 that no catalogues existed for the collection, and the university paid the trustees to compile catalogues of the library, coins, anatomical preparations, natural history and European art. No catalogue of the 'curiosities' seems to have ever been considered. Baillie relinquished his claim on the collection six years early, and Lockhart Muirhead transferred the collection to Glasgow by wagon over the summer and autumn of 1807.[1]

The oldest public museum in Scotland, The Hunterian opened its doors on the 26 August 1808 (McUre, 1872, II: 654-656; MacGregor, 1881: 387-389). The first Hunterian Museum faced out over the gardens of the original 1450s College of Glasgow buildings on High Street. John Laskey (1813) described the displays as containing many artefacts collected on Captain Cook's voyages of exploration. Existing donation registers for the first Hunterian museum cover the period 1808-1855, although there is scant evidence of Pacific art in them.[2] Plans were afoot from the 1840s to move the University campus away from the increasingly industrialised city centre (Moss, Munro and Trainor, 2000: 21-24). The University took possession of the present Gilmorehill campus in 1869, including the current Hunterian building, and the old site was demolished.

Over this transition, a breakdown in the documentation occurred. Except for three meetings in 1869 itself, quarterly minutes of the Hunterian Trustees Committee are lost between 1859 and 1881,[3] and when they resume, a note records that the Committee itself lapsed between 1869 and the Hunterian's reopening in 1877. This hiatus in the documentation is particularly regrettable, as it was between 1860 and 1889 that the tapa collection was greatly enhanced by several donations associated with the Reverend Dr George Turner, a member of the London Missionary Society in Oceania for more than 40 years. From 1873 onwards, thankfully, the Underkeeper Dr John Young supplied reports and donation lists to the University Senate, and these are preserved in the Minutes of Senate.[4] In general, donation lists between 1873 and 1900 also indicate very few ethnographic acquisitions.[5] One notable exception – probably the most significant event in the history of the Hunterian's cultural collections since it opened – was the 1889 acquisition of almost the entire ethnographic and zoological collection from the Andersonian Museum, the museum of Anderson's University in Glasgow.[6] Young had the sense to label the harder objects with small printed Andersonian Collection labels, but textiles were omitted, and no catalogue (if ever made) now exists. Perhaps as a result of this considerable expansion to the collection, a discrete Ethnological Department (covering archaeology and world cultures) was formed at the Hunterian in April 1897.[7] The Hunterian was never a purchasing ethnographic collection (Murray, 1925: 2-3), however, and no more tapa was donated to the museum between 1889 and 2019.

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1 A report to the University's Museum Committee for 5 October 1807 records that Muirhead was paid £108 on delivery. A few fragmentary sheets of Muirhead's box packing lists remain (University of Glasgow Special Collections *MR 47/1* and *MR 47/2)*. Although they almost entirely concern the natural history and anatomical specimens, they do record that 'Box 22 Contains War Instruments from the South Sea Islands – 8-21-16' (*i.e.* 45 items packed in 3 layers), and that 'Box 23 Contains…2pr of Snow Shoes', giving us some sense of the scale of Hunter's pre-1783 acquisitions. This accords with a description of Hunter's sitting room as containing a dense wall display of weaponry.

2 University of Glasgow Special Collections *MR 49/3*.

3 University of Glasgow Special Collections *MR 48/2*.

4 University of Glasgow Archives *SEN 1/1/10* onwards.

5 Although there were small accessions of Australian spears in 1881, and West African ornaments in 1897.

6 University of Glasgow Archives *SEN 1/1/15: 110-111, 288-289, 312*. By 1888, when it decided to close its museum, Anderson's University had become the Glasgow and West of Scotland Technical College, which has since become the University of Strathclyde.

7 University of Glasgow Archives *SEN 1/1/17: 289-290*.

Nonetheless, Prof. Anne Robertson's (1954) *Handbook to the Cultural Collections* indicates the prominence of Pacific art in its early 20th-century displays. The Hall of Cultural Collections comprised 62 cases, of which 13 contained Pacific material. The *Handbook* (1954: 44) shows that Case 41 contained a selection of the tapa and the museum's two beaters. During the 1960s, Robertson commissioned the archivist Helen Adsmoor to compile a list of all recorded ethnographic and archaeological donations before 1900, which formed the principal content of the museum's Ethnology Register. Keeper for Archaeology and Ethnography into the 1970s, Robertson numbered the entire ethnographic collection, which had never been done before, either in the Hunterian or the Andersonian. Unfortunately, she amalgamated what she saw as similar artefacts into the smallest possible number of accessions on coarse formal grounds, attaching them as cutter-numbers to make the collection fit the available (and incomplete) list of donations.

In the late 1970s Jane Glaister systematically reviewed the ethnographic collections. Finding the tapa particularly confused, she annotated page 84 of the Ethnology Register, 'Nos. 591 onwards were new numbers given to subdivided [accessions], or pieces not previously numbered, in 1978. Where relevant the previous number has been written in brackets. Jane Glaister 1978/79'. In doing so, Glaister drew on good mid-20th-century literature to correct geographical attributions of origin for around half of the cloths. This is broadly where we find ourselves today, and the remainder of this essay passes back over the foregoing history, addressing the principal acquisitions of barkcloth in chronological order, and noting smaller accessions in their proper place. While some consequent confusions of the foregoing history are irremediable, we can nevertheless improve upon our current understanding of this early barkcloth collection.

William Hunter's Cook-voyage tapa

During her early researches, Adrienne Kaeppler (1978a) took a cautious approach to the (then unsubstantiated) claims of Cook-voyage provenance for the Hunterian's Pacific collections. More recently, however, Kaeppler (2015) has significantly expanded on the number of objects authenticated in *Artificial Curiosities* – although she has not addressed the tapa. Several recent discoveries about the origins of Hunter's 'South Seas Curiosities' relate directly to the Hunterian's tapa. It is demonstrated here that Hunter's collection contained Pacific artefacts collected on all three of the Cook voyages. I discuss the three acquisitions in the order that Hunter made them.

Hunter's ex-Forster tapa

Five months before he acquired first-voyage material collected by Sydney Parkinson, and eleven months before the auction of David Samwell's third-voyage collection, Hunter's will of the 23 July 1780 already lists 'Curiosities from the South Seas' as one division of his collection.[8] Brock (1993: 1385) noted that Hunter knew Johann Reinhold Forster and J. Georg Forster, the naturalists on Cook's second voyage, in London between 1775 and when both men took up university posts in the German states.[9] Brock (ibid.) suggested

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8 University of Glasgow Special Collections *MS Gen 1000*.

9 The Forsters mediated between Hunter and Johann Karl Spener concerning a German edition of Hunter's (1774) *Anatomy of the Human Gravid Uterus*. Georg went to Kassel in 1778, and Johann Reinhold to Halle in 1780.

Figure 16.2. Tongan *ngatu* almost certainly acquired by William Hunter from Johann Reinhold and J. Georg Forster, 1775-1780: a) *Ngatu tahina* lacking *tukihea* overpainting (The Hunterian, GLAHM: E.417/8). b) *Ngatu 'uli* with distinctive early slat-based *kupesi* pattern (The Hunterian, GLAHM: E.458/5).

that he may have bought objects from them, although she could find no evidence in his correspondence. Very recently, however, Mungo Campbell has identified payments during this period from Hunter's current account at Munning's Bank to both J.R. Forster and Mrs. E. Forster (we suggest Johann's wife Elizabeth).[10] More concretely, tapa cloths in the published Forster collections, such as those of the Georg August University, Göttingen,[11] and the Pitt Rivers Museum, Oxford (Coote, 2015: 80-88),[12] may serve as *sibling cloth* concordances for Hunter's Forster collection. Several of these published cloths are self-evidently samples of larger cloths which the Forsters distributed elsewhere. We must be cautious, however, as the Göttingen collection also contains supplementary material from Cook's third voyage, acquired through the dealer George Humphrey; Hunter also knew Humphrey well, and Humphrey also attended the Samwell sale (see below). Be this as it may, stylistic comparison matches two cloths in Göttingen's Forster collection as siblings of two in Glasgow (Figure 16.2). In conjunction with the now-established payments, I take this to prove the existence of Forster material at the Hunterian.[13]

Hunter's ex-Parkinson tapa

Sydney Parkinson served as artist to the naturalist Sir Joseph Banks on Cook's first voyage to the Pacific. He provided the earliest images of tapa manufacture by sketching women at work in Tahiti during the 1769 British visit, and wrote an observant account of the process (Parkinson, 1773). Dr John Fothergill, a fellow Quaker and friend of Parkinson's father, had written his letter of recommendation to Banks before the voyage (Fothergill, 1773: 2). A friend of Hunter's and a fellow collector, Fothergill was a prominent doctor in London during the 1760s and first president of the Society of Collegiate Physicians.[14] After Parkinson died of dysentery on the homeward journey, an acrimonious struggle ensued over 1771-1772 between Banks and Sydney's brother Stanfield Parkinson for the ownership of Sydney's written account, images and Pacific artworks. After Stanfield suddenly died in the Bethlehem Hospital, Fothergill (1773: 14, 18) bought 'some clothes and instruments which were collected by Sydney Parkinson' from Stanfield's executors; Tahitian, Māori or Indigenous Australian items which had been found in his house. Fothergill added these items to his own large private museum.[15] When Fothergill died on the 26 December 1780, a clause in his will offered his friend Hunter first refusal on the purchase of his museum at a £500 discount (Comer and Booth, 1971: 281-283, 283n6). George Humphrey and George Fordyce valued it and Hunter bought it for £1,000, taking possession of it (including Parkinson's 'clothes and instruments') early in 1781 (Brock, 1993: 1694n2).[16]

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10 Personal communication, 2018.

11 https://www.nma.gov.au/explore/features/cook_forster.

12 http://web.prm.ox.ac.uk/cookvoyages/index.php/en/index.html.

13 First, the Hunterian's Tongan ngatu tahina sample GLAHM:E.417/8 is a sibling cloth of Göttingen Oz 599. Second, the Tongan ngatu 'uli sample GLAHM:E.458/5 is a sibling cloth of Göttingen Oz 631.

14 Hunter became the second president of this nonconformist physician's organisation upon Fothergill's death. Daniel Solander served as the Society's secretary under both men.

15 Fothergill (1773: 7-8) also acquired corals and 'marine productions' from the *Endeavour* voyage for his own collection, and it was he who mediated between Banks and Stanfield Parkinson in settling the list of objects that were subsequently sent on to Parkinson's family in the north (see Jessop, 2015). See Booth (2002) for an excellent archival representation of Fothergill's relationship with Banks.

16 At the present time, these clothes and instruments cannot be directly identified in the Hunterian.

Accession Number	Siblings and Rationale
GLAHM:E.417/8	Either ex-Forster or ex-Samwell. Sibling cloth of Göttingen Oz.599.
GLAHM:E.458/5	Either ex-Forster or ex-Samwell. Sibling cloth of Göttingen Oz.631.
GLAHM:E.598/2.	Sibling of ex-K. Hewett sample in Kaeppler (2011: 145), and of separate sample in WMW Vienna. Kaeppler (2011: 86) notes that Fichtel did not purchase any tapa at the Leverian sale but acquired third-voyage material directly from Humphrey.
GLAHM:E.598/3.	Sibling cloth of Kaeppler (2011: 146, Figs. 5.176 and 5.182).
GLAHM:E.598/4.	Sibling cloth of Kaeppler (2011: 146, Figs. 5.176 and 5.182).
GLAHM:E.601.	Under ultraviolet torchlight, reverse of cloth bears blue ink inscription *'46'*, corresponding with Samwell catalogue: 'Lot 46. A piece of curious dark striped openwork cloth, from Sandwich Isles'. Also, a sibling cloth of GLAHM:E.666, and of Kaeppler (2011: 146, Figure 5.177).
GLAHM:E.666.	Sibling cloth of GLAHM:E.601, and of Kaeppler (2011: 146, Figure 5.177).

Table 16.1. Minimal list of Cook-voyage barkcloths at The Hunterian.

Hunter's ex-Samwell tapa

William Hunter and his younger brother John made purchases of Cook third-voyage material at Hutchins' Auction Rooms, Covent Garden, on Thursday 14 and Friday 15 June 1781; the sale of David Samwell's collection, surgeon's mate aboard HMS *Discovery*. One extant copy of the Samwell auction catalogue is presently known, in the archives of the Bernice P. Bishop Museum in Honolulu. It was identified as Samwell's auction by Adrienne Kaeppler only recently (Anon., 1781; Kaeppler, 2015: 255). Approximately 20% of the 248 lots in the catalogue are annotated with values, and fewer than 30 lots have names attached to them. 'Hunter' appears next to two lots on Day 1 and Day 2, and 'J. Hunter' next to six lots on Day 2.[17] Two lots principally concern us here: Lot 229 ('A beautiful piece of chequered painted cloth, from Owhyhee. 10s 6d J. Hunter') and Lot 240 ('A piece of fine white Otaheite barkcloth. 5s 6d Hunter'). Some of the other purchases the Hunters made can be readily identified in Laskey's (1813) *General Account of the Hunterian Museum*, and these purchases validate his statement that the collections came from the voyages of Captains Cook and King.

Moreover, the majority of lots in the Honolulu catalogue remain unmarked and it is very likely the Hunters acquired other material. It is also worth noting that 64 lots in Samwell's sale (26% of them, or almost half if the natural history specimens are set aside) were entirely or overwhelmingly tapa: 111 pieces of cloth, plus a Tahitian *i'e* beater, a Tongan kupesi board, and Lot 12 ('Various small specimens of cloth, matting, &c.'). Much like the Forster second-voyage collections at Göttingen and Oxford, we can use the other known destinations of Samwell material,[18] via the Leverian Museum and the later Museum Humfredianum, to identify sibling cloths for Hunterian material and deduce their ex-Samwell identity. Kaeppler's (2011) discussion of the Leverian destinations, therefore, and most notably Fichtel's acquisitions for the imperial cabinet in Vienna (now in the Weltmuseum Wien), as well as third-voyage material

17 Hunter often sent his family and friends to auctions to buy for him. At that time, both his brother John and his nephew Matthew Baillie were dissection assistants at Hunter's anatomy school.

18 The list of other names against purchases is impressive: George Humphrey, Sir Ashton Lever (Kaeppler, 2011), Shaw (I believe, the barkcloth sample book producer Alexander), Tozer, and 'Bayley' (presumably either the third-voyage astronomer William Bayly or Hunter's nephew Matthew Baillie).

Figure 16.3. Hawaiian kapa collected by David Samwell on Cook's third voyage and purchased by the Hunters in June 1781: a) The Hunterian, GLAHM: E.598/2. b) The Hunterian, GLAHM: E.598/3. c) The Hunterian, GLAHM: E.598/4. d) The Hunterian, GLAHM: E.601. e) The Hunterian, GLAHM: E.666.

Alex. Angus Donation Letter and Cloth Numbers	James Couper Label	GLAHM:
1. A piece of Cloth made by the natives of Owhyhee, from the Bark of the Touta or Cloth Tree. [Halved by James Couper and annotated a, b]	'No.1.b Piece of Cloth made by the Natives of Owhyhee from the bark of the Cloth-tree. Presented by Mr. Angus 10th Octr. 1809'. [Detached Ethnography Label E44-5]	E.591/5
	'No.1st.a A piece of Cloth made by the Natives of Owhyhee from the bark of the Touta or Cloth-tree. Presented by Mr. Angus 10th Octr. 1809'. [Detached Ethnography Label E44-4]	E.591/6
2. Another piece – ' ' – of a finer texture.	Label missing, presumed lost, and no current Hunterian object was found inscribed No.2. Unidentified.	
3. Another piece – ' ' – yellow colour.	'No.3d. A piece of Cloth made by the Natives of Owhyhee from the bark of the Touta or Cloth-tree – of a yellow colour. Presented by Mr. Angus 10th Octr. 1809'. [Detached Ethnography Label E44-1]	E.591/3
4. A Piece of Cloth made by the Natives of Otaheite, from the bark of the same tree – of a thicker texture.	'No.4b Piece of Cloth made by the Natives of Otaheite from the bark of the Cloth-tree. Presented by Mr. Angus 10th Octr. 1809'. [Detached Ethnography Label E44-3]	E.591
5. Another Piece – ' ' – of a brown colour.	'No.4 A piece of Cloth made by the Natives of Owhyhee from the bark of the Touta or Cloth-tree of a brown Colour. Presented by Mr. Angus Octr. 10th 1809'.[Detached Ethnography Label E44-2]	E.591/4

Table 16.2. Identification of 1809 Alexander Angus donation of Tahitian and Hawaiian barkcloth.

that Humphrey sold on to Göttingen in 1782, permit us to identify five more Hawaiian Cook-voyage *kapa* in Glasgow (Figure 16.3). To summarise the seven Cook-voyage barkcloth in the Hunterian asserted here, see Table 16.1.[19]

Tapa in the first Hunterian Museum

The first documented donation of Polynesian barkcloth to the Hunterian was made on 10 October 1809 by Alexander Angus R.N., a surgeon-dentist who set up in business in Glasgow in August 1808.[20] Angus' donation letter lists three Hawaiian and two Tahitian barkcloths, as well as an 'Otaheite' calabash and carrying pole (both Hawaiian), and some South American items.[21] Information associated with this donation shows that Angus was off the north coast of Peru in 1807, although he does not appear on the Navy List in this period, and may have been working in the merchant fleet. Angus donated five cloths (and marked them No.1 to No.5) but the museum superintendent James Couper became confused about their correlation to the list, and also subdivided two of them. Therefore, the *List of Donations to the Hunterian Museum* records seven specimens of cloth received from Angus.[22] Examining the cloths for fabric type, dimensions, inscriptions and label shadows, as well as finding four of Couper's original labels among the *Detached Ethnography Labels* (all of them are 102-104mm wide), we can re-identify five of these seven objects (Table 16.2). The Angus donation therefore swelled a collection already skewed towards the Society Islands and Hawai'i, before the first guide to the Museum was written. Most important for our understanding of the collections, however, we have a continuous record of donations from the opening of the Museum to the writing of that guide (Laskey, 1813),

19 NB, while several of these objects may have been Samwell Lot 229, the plain Tahitian Lot 240 remains unidentified at this time.

20 *The Glasgow Herald*, 29 August 1808: 3.

21 University of Glasgow Special Collections *MR 50/1*.

22 University of Glasgow Special Collections *MR 49/1*.

and the Angus donation is the only accession of barkcloth supplementary to the founding collection over that five-year period.

Capt. John Laskey's (1813) *General Account of the Hunterian Museum* is informative on Couper's first display arrangement. Those collections which concern us here were displayed in Case 2 of the Apartment on the Left of the Saloon, with one Tahitian barkcloth beater (GLAHM: E.439/1) hung on the internal wall of the Hall of the Elephant among various weapons and tools in the founding collection (Laskey, 1813: 20-21, 71-72). Of the former, Laskey (ibid.: 20) wrote: 'Glass case, No.2 contains principally the admirable and curious articles collected during the voyages of Captains Cook, King, &c. in the South Seas…[including] a great number of specimens of PLAIN CLOTH from Otaheite and other of the Friendly Isles. With PAINTED or STAINED CLOTH from the Sandwich, New Zealand and Marquesas Islands'. Primarily a conchologist, Laskey himself had little idea which Pacific objects came from which nations. There is neither Marquesan nor Māori tapa at the Hunterian. His descriptive list (ibid.: 21) of selected items in Case 2 compounds these inaccuracies by suggesting that the items numbered 1-5 constituted a 'chief mourner's costume' from 'Owhyhe' rather than Tahiti; doubtless this was an arrangement in the case, cobbled together from various tapa, three Tahitian *taumi* gorgets and some 'slips of mother of pearl'. Two very fine taumi remain, but the third, and the pearlshell slips, have disappeared alongside the unspecified number of Hawaiian feather *lei* in this case; apparently decaying away to nothing, while leaving dozens of black or red feather barbs tangled in the surfaces of several plain Tahitian cloths in the collection.

'A great number of specimens of PLAIN CLOTH of Otaheite'

Laskey (1813: 20) described 'a great number of specimens of PLAIN CLOTH of Otaheite' on display in Case 2. Having identified the Angus accession above as the only post-Hunter/pre-Laskey barkcloth, we can observe that there are, indeed, 17 other large, plain single-layer Tahitian cloths in the collection, all of *hopū* fabric of a fineness which had essentially disappeared in the Society Islands by the 1820s.[23] These 17 cloths were isolated as an analytical set, and classified into three basic types with matching beater mark grades, thicknesses, flexibilities and damage characteristics. Comparison of their dimensions within these fabric types quickly revealed that 13 of them had been cut into tolerably matching lengths or widths in imperial feet and inches, and that these 13 cloths tessellate as siblings, which were originally four large rectangular parent cloths – presumably when they entered the collection (Table 16.3).

The reader should note the similar original sizes of the *Tahitian Medium Papery Parent A* cloth and the *Tahitian Fine Papery Parent* cloth (my terminology).[24] I consider the *Tahitian Superfine Supple Parent* was most likely Samwell Lot 240, although this is conjectural. The listed sibling cloths in Table 16.3 all share a distinctive damage pattern of heavy creasing and

23 The 1960s E-Register records an 1826 accession of 'Two Pieces of Native Cloth, Sandw. Is. 3½". Rae Wilson Esq.' However, the original donation books for this period, museum records, Detached Ethnography Labels, and Helen Adsmoor's composite feeder list for the E-Register do not. The two small pieces of Hawaiian kapa attached to this number today (GLAHM: E.380/1 and GLAHM: E.380/2) are both more than twice this size in their narrowest dimension, and this attribution to Rae Wilson is rejected here.

24 Other Tahitian cloths in The Hunterian also match these parent cloths in style and condition but cannot be shown as siblings of those listed above. In the process of subdivision, various other remnants have also been destroyed or distributed elsewhere.

Sibling Cloths	Reconstructed Parent Cloth	Dimensions
GLAHM:E.457/5, GLAHM:E.457/4, GLAHM:E.475/10, GLAHM:E.594/11	Tahitian Medium Papery Parent A	4960 x 3220mm 16′ 4″ x 10′ 6″
GLAHM:E.457/2, GLAHM:E.594/5, GLAHM:E.594/9	Tahitian Medium Papery Parent B	2700 x 2470mm 8′ 10″ x 8′
GLAHM:E.457/6, GLAHM:E.594/4, GLAHM:E.594/10	Tahitian Fine Papery Parent	5000 x 3430mm 16′ 5″ x 11′ 3″
GLAHM:E.457/9, GLAHM:E.457/11, GLAHM:E.594	Tahitian Superfine Supple Parent	8650 x 2250mm 28′ 4″ x 7′ 4″

Table 16.3. Analytical reconstruction of parent cloths for early plain Tahitian *'ahu* in The Hunterian.

folding, an extensive accumulation of soot, and patches of rusty water damage and rotting-away at the internal corners where they were formerly folded into rectangular bundles. Hooper (2006: 106-107) has observed that many of the Hunterian's founding collection artefacts are encrusted with sooty accumulations; explained by the fact that the first museum was heated by two open coal fires. It equally seems evident that the same processes of smoke damage, and the decay which consumed the Hawaiian and Tahitian featherwork purchased at Samwell's sale, also wrought irreparable damage on the Tahitian barkcloth.

George Turner, William Logan and the Andersonian Collection

A further important collection came from the Reverend Dr George Turner LLD (1818-1891), a prominent Scottish missionary of the 19th century. Born and raised in Irvine, Ayrshire, he studied Divinity at the University of Glasgow, and attended seminary in Paisley. Turner joined the London Missionary Society (LMS) in 1840 with his lifelong friend, James Nisbet of Govan, and the pair sailed with their wives to 'Upolu, Samoa, where Turner was to work until 1883. As a Superintendent Missionary, Turner periodically toured the many LMS mission stations throughout the Pacific,[25] amassing a diverse collection of Pacific artworks. During his missionary career, he spent two lengthy respite periods in Glasgow (June 1860-March 1863, and May 1870-October 1873). During Turner's first return to Glasgow, he published *Nineteen Years in Polynesia* (1861), delivered a series of public lectures across central Scotland on the progress of the LMS in the Pacific,[26] was awarded an honorary doctorate by the University of Glasgow, and presented the Hunterian a large collection of 110 Pacific artefacts.[27] On the 18 March 1861, Turner lectured at the Glasgow City Mission,[28] run at this time by the Reverend William Logan, a prominent temperance preacher (Craik, Eadie and Galbraith,

25 April-June 1845 (Vanuatu and the Loyalty Islands of New Caledonia); July-September 1848 (Vanuatu, the Loyalty Islands and off the coast of Niue); September-December 1859 (Same tour as 1848, but made landfall on Niue); May-July 1876 (Same tour again, plus Tokelau).

26 *The Glasgow Herald*, 4 November 1860, 16 November 1860.

27 University of Glasgow Special Collections *MR 50/56*. George Turner's small 8-page 1860 donation list records 110 mixed items of art and natural history from Samoa, Niue, Vanuatu, the Loyalty Islands (New Caledonia), Tokelau, Fiji, Tahiti, the Cook Islands and Norfolk Island. It has evidently been lost and rediscovered at least three times since 1860. Given its deductive significance for elucidating the provenance of the whole Pacific collection, this fact explains many of the confusions that have plagued Hunterian curators concerning this material.

28 *The Glasgow Herald*, 16 March 1861.

Figure 16.4. *Interior of the Andersonian Museum*. John A. Gilfillan, circa 1831-2 (Archives and Special Collections, University of Strathclyde, P2/1/14).

1886: 177-178). He evidently presented Logan with a small collection (of ten or more objects) around this time. Furthermore, at some time during this first 1860-1863 stay in Glasgow, Turner also presented a substantial collection to the Andersonian Museum (Figure 16.4; Anon., 1799; Sexton, 1897: 161; Wood, 1971). The *Catalogue of the Museum of Anderson's University* (Anon., 1866: 6) records that its 'SIDE APARTMENT – WEST… is devoted to Ethnology and Archaeology', and, in enumerating its display cases, 'Nos. 2, 3. – Specimens of dress and implements…classified according to their ethnological provinces…POLYNESIA – Numerous specimens from New Zealand, the Samoa Islands, &c. The Museum is greatly indebted to the Rev. Dr Turner for Polynesian specimens'.[29]

In 1869, William Logan donated at least ten ethnographic items to The Hunterian, including two samples of Samoan *siapo*; as mentioned above, the ethnological collections of the Andersonian were also transferred to The Hunterian in 1889, meaning that all three of these ex-Turner collections now reside in The Hunterian. Turner's second respite in Glasgow (1870-1873) was overshadowed by the death of his first wife Mary Anne, but also motivated by his son William Young Turner studying medicine and divinity at Glasgow. William made an 1872 donation to The Hunterian, also of material from his father's

29 It remains uncertain whether other ex-Turner collections exist in western Scotland; Paisley Museum contains a remarkable collection of Cook Islands god images and other material almost certain to have come from an LMS source.

Figure 16.5. Turner Collection tapa subject to subdivision and redistribution: a) The Hunterian, GLAHM: E.417/11, a Samoan siapo ema donated to The Hunterian in 1860, with siblings that were donated to the Glasgow City Mission and the Andersonian. b) The Hunterian, GLAHM: E.458.6, a rare frame-printed cloth of Aitutaki, Cook Islands, originally donated to the Andersonian; at least two (probably three) identical sheets were detached from this object and given to The Hunterian and the Glasgow City Mission; both of those are now in the National Museum of Scotland's collection.

collection.[30] From these four different accessions – 1860, 1869, 1872 and 1889 – we can reconstruct the ex-Turner barkcloth and tapa-related collections.

Some Andersonian items retain their stylistically distinctive display labels, and others survive in documentation collections at The Hunterian.[31] Although few, these labels are highly informative when interrelated with The Hunterian's existing holdings

30 Detached Ethnography Label E-51, formerly attached to a pair of shark-tooth swords from Kiribati, reads 'from George Turner's Collection, Presented by W.Y. Turner, MD. 1872'. William undertook missionary work in the Papuan Gulf (1876-1877), and his subsequent 1878 donation comprised his own collections.

31 The majority are 74-75mm (*i.e.* 3 inches) wide, and of variable height, with the donor's name bottom-right.

from Oceania, and George Turner's 1860 donation list to The Hunterian. Several record Turner provenances, and several are inscribed with the same *verbatim* text as items listed in Turner's 1860 Hunterian donation letter. The Hunterian's wider Pacific art collection frequently contains pairs of rare Niuean or other Polynesian items – for which only one is enumerated on the 1860 Hunterian donation list, and the other bears an original Andersonian label, or one of the Andersonian Collection labels that were attached to many objects in 1889; although not identical, the two collections were evidently comparable in size and contents.[32] By document and label analysis, physical examination, and the elimination of all possible alternatives, we come to the tapa list in Table 16.4.

It is worth discussing two subdivided cloths further: first, Turner brought a rare piece of black-glazed Samoan *siapo ema* back to Glasgow in 1860, cut it into at least three pieces, and gave one piece to The Hunterian (GLAHM:E.417/11; Figure 16.5a), one to William Logan (GLAHM:E.592/2), and one to the Andersonian (GLAHM:E.417/3). These were physically fitted back together in 2016. The second cloth from Table 16.4 of interest is a rare Aitutaki composite object; when Turner acquired it, it consisted of at least four (possibly five) square sheets of cloth, two of brown-dyed *pareu* fabric and two of black-glazed *piri* fabric, starch-pasted together end-to-end in a line alternating black-brown-black-brown. All four sheets are printed with a diagonal net pattern termed *okaoka* using the uniquely Aitutaki stamping frame method (Hiroa, 1944: 74). Turner removed two of the four sheets (which still retain their white glue strips) and gave the brown one to The Hunterian as No.6 on his 1860 donation list (it is now NMS: A.UC.410, but still bears his inscription 'No.6'). It seems he gave the black-glazed one to William Logan (NMS: A.UC.447), and the conjoined pair to the Andersonian Museum (GLAHM: E.458/6; Figure 16.5b). At some time after 1889, when all three objects were in The Hunterian, Dr Young evidently considered the two detached sheets duplicates of the conjoined pair; as I discuss below, they were subsequently sent on to the Royal Scottish Museum in Edinburgh.

Tapa in the second Hunterian Museum

Reading between the lines, it seems clear that the second Hunterian opened in 1877 as a museum with a dominant emphasis on natural sciences that continued into the early 20th century. The failure to catalogue the Andersonian Museum collection is *prima facie* evidence of this, and responsible for much of the uncertainty relating to the cultural collection. Beyond the Turner collection, it is almost certain that the Andersonian had received other barkcloth samples.[33] Equally, while there are no documented donations of tapa after W.Y. Turner's gift of 1878, we know that Dr Young's donation lists were incomplete, because they omit an 1887 donation of Fijian *masi* from Dr David Blyth, an alumnus of the university and provincial medical officer in the British colonial administration for three years during the mid-1880s (Blyth, 1887).[34] Inscriptions and the *Detached Ethnography*

32 Relevant examples would be the museum's pairs of Niuean nose-flutes, Niuean ceremonial adzes, Niuean gaming darts, Tokelauan buckets, and so on.

33 The Andersonian's superintendent Professor John Scouler (1831) provided a brief list of donations and donors in his *Account of the Andersonian Museum*, documenting early Pacific acquisitions. Barkcloth is not mentioned directly.

34 *The Melbourne Argus*, Friday 8 July 1887: 7.

Accession Number	Source Documentation or Rationale	Locality and Type
GLAHM: E.591/1	Turner 1860 Donation List: 'No.9. White native cloth from the bark of the bread fruit.' (Inscribed 'No.9').	Cook Islands *Inaina*
GLAHM: E.591/2	Turner 1860 Donation List: 'No.5. White native cloth Savage Island, Samoa, &c'. (Inscribed 'No.5' with verbatim text).	Niue *Hiapo*
GLAHM: E.417/1	Andersonian-style Detached Ethnography Label E-54: 'Native Cloth from Samoa Islands. Made from the Mulberry. Rev. George Turner'.	Samoa *Siapo mamanu*
GLAHM: E.595	Andersonian-style Detached Ethnography Label E-52: 'Native Cloth, Tongataboo. Revd George Turner'.	Tonga *Ngatu tahina*
GLAHM: E.417/2	Andersonian 1889 or Logan 1869: No other possible source of early Niuean material (Figure 16.6a).	Niue *Hiapo*
GLAHM: E.417/4	Andersonian 1889 or Logan 1869: No other possible source of early Niuean material.	Niue *Hiapo*
GLAHM: E.417/6	Andersonian 1889 or Logan 1869: No other possible source of early Niuean material (Figure 16.6b).	Niue *Hiapo*
GLAHM: E.592/1	Logan 1869: Logan Label No.9.	Samoa *Siapo tasina*
GLAHM: E.417/11	Turner 1860 Donation List: 'No.7. Strip of native cloth Savage Island, Samoa, &c.' (Labelled 'No.7').	Samoa *Siapo ema*
GLAHM: E.592/2	Logan 1869: Logan Label No.10. Sibling cloth of GLAHM:E.417/11 and GLAHM:E.417/3.	Samoa *Siapo ema*
GLAHM: E.417/3	Inferred ex-Andersonian 1889: Sibling cloth of GLAHM:E.417/11 and GLAHM:E.592/2.	Samoa *Siapo ema*
GLAHM: E.458/6	Inferred ex-Andersonian 1889: Two conjoined sheets of original four-sheet composite. Sibling cloth of NMS:A.UC.410 and NMS:A.UC.447.	Aitutaki, Ck. Ids *Pareu-piri* Composite with *okaoka* printing
NMS: A.UC.410	Turner 1860 Donation List: 'No.6. Sheet of native cloth Printed Savage Island, Samoa, &c' (Inscribed 'No.6'). One detached sheet of original four-sheet composite. Sibling cloth of GLAHM:E.458/6 and NMS:A.UC.447.	Aitutaki, Ck. Ids *Pareu* with *okaoka* printing
NMS: A.UC.447	Andersonian 1889 or Logan 1869: One detached sheet of original four-sheet composite. Sibling cloth of GLAHM:E.458/6 and NMS:A.UC.410.	Aitutaki, Ck. Ids *Piri* with *okaoka* printing
GLAHM: E.433	Turner 1860 Donation List: 'No.8. Board or Block used in Samoa for Printing Cloth'.	Samoa *'Upeti*
GLAHM: E.427	Turner 1860 Donation List: 'No.41. Fancy Feather Belt from Savage Island'.	Niue Feather belt
GLAHM: E.439/2.	Turner 1860 Donation List: 'No.75. Mallet for Beating Out the Bark in Making Native Cloth'.	Niue *Ike*
-	Turner 1860 Donation List: 'No.4. Strip of the raw material of which native cloth is made viz the bark of the paper mulberry'. (This material has disappeared, believed destroyed in a fire in the University's Botany building.)	Unknown
-	Andersonian-style Detached Ethnography Label E-63: 'Turmeric from Samoa. Used for Colouring Cloth &c'.	Samoa

Table 16.4. Minimal inventory of George Turner collection barkcloth and related items.

Figure 16.6 (overleaf). Two Niuean *hiapo* collected by George Turner in November 1859, part of the earliest extant collection of material culture to leave Niue and enter a western museum: a) The Hunterian, GLAHM: E.417/2. b) The Hunterian, GLAHM: E.417/6.


a
b

Accession Number	Description
GLAHM:E.417/5	*Masi ni tubetube e na soqo*, Noikoro district, Upper Sigatoka, Viti Levu.
GLAHM:E.458/3	*Gatu vakaviti* of Lau Islands, end-sample bordered on three sides (Figure 16.7a).
GLAHM:E.537	*Masi kesa*, sample of border stencilling (Figure 16.7b).
GLAHM:E.596/7	Pleated *isala* turban of *seavu*.
GLAHM:E.610	Pleated *isala* turban of *seavu*.
GLAHM:E.536	Four sticks of Fijian *Broussonetia papyrifera*.
GLAHM:E.594/8	Production sample, initial stage of *seavu* production.
GLAHM:E.605	Production sample of *masi buco*, early phase of spreading bast.

Table 16.5. Fijian masi donated to The Hunterian in 1887 by Dr David Blyth.

Labels (E45, E66, E67) show that Blyth's donation included five samples of masi, and a progressive sequence demonstrating stages of manufacture (Table 16.5).[35]

In drawing this overview towards its close, I wish to return to the fact outlined above that two Turner-derived Cook Islands cloths formerly in The Hunterian now belong to the National Museum of Scotland (NMS). Having made this discovery, further comparison of The Hunterian and NMS tapa collections shows that these two cloths represent part of an exchange of tapa (and possibly other material) which occurred between the two institutions at some time after 1889, and seemingly before the 1920s (Table 16.6). This came as a surprise to curators at both institutions, as no exchange of ethnographic material has ever been recorded at either institution. It has so far been easier to identify ex-Hunterian tapa at NMS than *vice versa*. In addition to the two samples of Aitutaki cloth, there are six plain Tahitian cloths bearing the distinctive Hunterian founding-collection traits of creasing, soot and rusty water damage discussed earlier – all in keeping with the best selected from the Glasgow set.[36] There are also three Hawaiian kapa samples of 18th-century type, which are sibling cloths cut from larger examples in Glasgow. Apart from the rare Aitutaki fabrics, all the others would thus have had putative Cook-voyage attributions at the time.

Ex-NMS collections in Glasgow are harder to identify, but one key example is a heavily damaged piece of coarse Tahitian *'ahuapi* (rebeaten and rubbed) cloth, which was donated to the University of Edinburgh's Natural History Museum in 1827 as part of a large collection acquired by General Sir Thomas Makdougall Brisbane of Largs (1773-1860).[37] GLAHM:E.595/2 bears the post-1836 pencil inscription 'Sir Thos. Brisbane, Bart. Sydney.' The Industrial Museum Of Scotland inherited the University of Edinburgh's collections around 1860, and went through various name-changes to become the National Museum of Scotland today (Idiens and Knowles, 2015: 193); it appears to have been the Royal Scottish Museum at the time

35 Other Blyth donations included a sample of *magimagi* cordage (GLAHM:E.534) and a Caroline Islands belt (GLAHM:E.533).

36 I am grateful to our project partner Dr Antje Denner for providing images, documentation and access to the collections.

37 The University of Edinburgh Natural History Museum's accession register (now in the National Museum of Scotland) records on p.85: '18. Weapons, utensils, articles of dress, skulls, opalized wood, Presented by Sir Thomas Brisbane.'

Figure 16.7. Two samples of masi collected by Dr David Blyth in Fiji between 1884 and 1887: a) The Hunterian, GLAHM: E.458/3, *gatu vakaviti* of the Lau Islands. b) The Hunterian, GLAHM: E.537, *masi kesa* demonstrating exceptionally crisp stencilling.

Accession Number	Description and Rationale of Relationship
A.UC.789	Sample of Hawai'ian *kapa lalani* of 18th-century style; interconnecting sibling cloth of GLAHM:E.601 and GLAHM:E.666. While A.UC.789 is 400mm wide and has been cut on 3 sides, its siblings (cut on one end only) are 670mm and 708mm wide. It is asserted here that A.UC.789 is one part of the original sample, the other portion removed for inclusion in two large barkcloth albums compiled at the Royal Scottish Museum, one of which was subsequently sent on to the Bernice P. Bishop Museum in Honolulu. All are ex-Samwell and match another sibling now in Vienna (*WMW* Cloth No.66).
A.UC.410 A.UC.447	Two pieces of stamping-frame printed cloth from Aitutaki in the Cook Islands; brought back to Glasgow by the Revd. Dr George Turner in 1860. A.UC.410 proves this, as on the reverse it still bears the remnants of an ink inscription 'No.6' in Turner's hand, which correlates with Turner's donation list to The Hunterian.
A.UC.727	Russet parallel and oblique liner-stamped cloth. It and A.UC.777 are both small siblings of larger piece GLAHM:E.667.
A.UC.777	Red and brown parallel and oblique liner-stamped and cord-printed cloth. It and A.UC.727 are both small siblings of larger piece GLAHM:E.667.
A.UC.740 A.UC.745 A.UC.746 A.UC.749 A.UC.752 A.UC.815	Smoke- and water-damaged Tahitian *hopū* cloths. Of Hunterian founding collection type.
GLAHM:E.595/2	Tahitian sample inscribed 'Sir Thos. Brisbane, Bart. Sydney'. Ex-Natural History Museum, University of Edinburgh. Rest of Brisbane collection remains at NMS.

Table 16.6. Material exchanged between The Hunterian and the Royal Scottish Museum at some time between 1889 and the 1920s.

this exchange would have occurred.[38] The absence of commensurate ex-Edinburgh material in Glasgow is a little perplexing, but much of what remains in The Hunterian, unaccounted for by the foregoing discussion (and the uncertainties surrounding other potential Cook-voyage material), amounts to a large and diverse set of Hawaiian kapa samples. Primarily of early 19th-century style (see Mills, Chapter 7), these appear to constitute a sample-set of fabric types that are of unexplained origin at the present time but would be easily furnished from the great strength of Edinburgh's Hawaiian kapa collection. Further collaboration between The Hunterian and the National Museum may reveal more of these details in the future.

Discussion

In a short overview of a long and tangled history – in which the various branching pathways often peter out and occasionally reappear in unexpected places – I have tried to show the reader both a methodology for the study of such a tapa collection, and to describe its principal features. Whether we will ever identify more than a few dozen of them or not, The Hunterian is undoubtedly one of the few museum collections in the world to hold objects from all three of the Cook voyages. Commensurate with this fact is the great number and range of early Society Islands fabrics in the collection, alongside some remarkable early rarities from Tonga and Hawai'i too. Equally, the serendipitous reaggregation of George Turner's collection in the Hunterian after 1889 has furnished it with a unique set of Western Polynesian barkcloths, including the oldest Niuean collections in the world (which George Turner was gifted in November 1859 as, apparently, the first European to be welcomed onto the island). Shifting priorities and a poor documentation culture during the late Victorian period may have clouded the museum's past somewhat, but ongoing work on these collections, and their wider relationships across Scotland and Europe, promises to uncover much more in the future.

38 The Brisbane family's significance in Ayrshire and Glasgow (his father taught medicine at the University and instituted a bursary) can be the only reason that Dr Young wanted yet another piece of plain Tahitian cloth.

17

From Maker to Museum: Polynesian Barkcloth at the Royal Botanic Gardens, Kew

Mark Nesbitt, Brittany Curtis, Andy Mills

Introduction

Founded in 1847, the Museum of Economic Botany at Kew Gardens, in west London, was the first of its kind (Figure 17.1). Drawing on the latest technologies of glass and wrought iron, the Museum displayed plant raw materials and products over two floors in Decimus Burton's conversion of a royal fruit store (Cornish, 2017). The Museum's founder, and Director of the Royal Botanic Gardens, Kew, was Sir William Hooker. He rapidly articulated a scope for the museum, 'all kinds of useful and curious Vegetable Products, which neither the living plants of the Garden, nor the specimens in the Herbarium could exhibit', a method of display, 'the raw material, and, to a certain extent, also the manufactured or prepared article… correctly named, and accompanied by some account of its origin, history, native country, etc.', and an audience of '…not only the scientific botanist, but… the merchant, the manufacturer, the physician, the chemist, the druggist, the dyer, the carpenter and cabinet-maker, and artisans of every description' (Hooker, 1855).

Tapa cloth was part of the Museum from its opening. Accession number 3.1847 on the first page of the first Museum Entry Book is 'An extensive collection of specimens presented by Sir E. Home R.N. consisting of a Kava bowl and tow; stems of the Kava plant *Piper methysticum*; various specimens of Tapa cloth; shells and beater for preparing the Tapa cloth; Type made of Pandanus leaves for printing the cloth; Rough mats made of vegetable fibre from the Navigators and Friendly Islands.' This group of items well illustrates the distinctive nature of an economic botany collection: the combination of raw materials, tools and finished products, identified by the botanical name of the plant. At Kew these were arranged by plant family, to enable visitors to understand how related plants often share properties, for example, the many genera in the mulberry plant family (Moraceae) that are used for barkcloth worldwide.

The global scope of the collection means that although it was large, growing to about 70,000 specimens spread over four buildings by 1910, coverage of a given plant use is typically shallow. There are many exceptions – for example, there are world class

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Figure 17.1. Museum No. 2 at Kew, photographed on its closure to the public in 1960. This was the first museum building to open at Kew, in 1847. The arrow indicates a Tahitian *tiputa* on display, collected by HMS *Galatea* in 1869 and transferred to the British Museum in 1960 (British Museum, Oc1960,11.24).

collections of Japanese paper and lacquer, artefacts from the northwest Amazon, and objects from the East India Company's museum - but in the case of tapa, just 55 pieces cover the whole of Polynesia (Table 17.1). The collection originally numbered perhaps another 30 pieces, but many ethnographic objects were given to the British Museum, Pitt Rivers Museum and Horniman Museum in 1958-61, to relieve pressure on space. That the majority of the tapa cloths were not transferred is doubtless a result of their invisibility to the museum curators who made the selection of objects. Given the emphasis of the Kew Museum on the usefulness of plants, tapa cloth was displayed folded, often hiding features of interest such as its ornamentation, or construction as garments. It is only as Kew's Polynesian barkcloths have been studied and treated by textile conservation students over the last two decades that their function as garments, and thus as constructed objects rather than samples of cloth, has come to the forefront (Lennard, Tamura and Nesbitt, 2017). The tapa collection reflects the Museum of Economic Botany's broader trajectory. In the early 20th century the Museum began to focus on raw materials rather than objects, and the overall number of acquisitions fell sharply after 1914, only sustained by the acquisition of major 'orphan' collections of raw materials from other collections from the late 1980s onwards. This shift came about as a result of several trends: the development of specialist institutes elsewhere, the increasing focus of botanists in general on understanding the distribution and relationships of wild plants and, from the 1950s, increased interest in oil-based synthetic products (Nesbitt and Cornish, 2016). As a result, Kew's tapa collection largely dates to the mid-late 19th century. In addition, as a result of the quiet neglect of the Museum in the 20th century, the tapa specimens have been little affected by inappropriate conservation, or by the regular cutting of pieces to supply samples that is typical of many museum collections.

In 1988-90 the former Museum buildings were repurposed, and the entire collection, now renamed the Economic Botany Collection (EBC), was moved to purpose-built storage in the Sir Joseph Banks Building. A case of tapa was shown in Kew's *Plants+People* exhibition (1998-2016), pieces have been lent to several exhibitions (*e.g.* Sainsbury Centre for Visual Arts, 2006; Rautenstrauch-Joest-Museum, Cologne, 2014), but the main emphasis in the last decade has been on conservation and research. Since 1995 students from the Textile Conservation Centre (since 2010 the Centre for Textile Conservation and Technical Art History at the University of Glasgow) have undertaken repacking and interventive conservation of Kew's tapa collection (Lennard, Tamura and Nesbitt, 2017). For the *Situating Pacific Barkcloth* project the whole tapa collection was moved to Glasgow for conservation and study (see Chapter 22). Other research, by Brittany Curtis (2016) on the HMS *Galatea* expedition, and by the *Mobile Museum* project team on the dispersal of ethnobotanical specimens from Kew (Cornish and Driver, 2019), has also shed much light on the current location of former Kew specimens. One mystery yet to be solved is why 36 pieces of tapa were among the many objects sent by Kew to schools for educational purposes in the period 1880-1914; it is unclear from which tapa specimens these were sourced, or what was their pedagogical use.

Formation of the Kew collection

Kew was rarely able to commission economic botany specimens to order. Instead, it spread its net wide (Table 17.1). Travellers of many different types were asked to collect for Kew, usually without payment but with free transport for goods to Kew. William Hooker's text in the Admiralty's *Manual of Scientific Enquiry* offered guidance on what to collect, and emphasised that 'the several stages of preparation should be collected, not only as objects of curiosity, but because they exemplify the progress of art and science' (Herschel, 1849). Unsurprisingly, given the island topography of Polynesia, naval officers are an important source, including Sir James Everard Home (HMS *North Star*, HMS *Calliope*, 1840s), Lt. Marshall (ship not yet identified) and Captain Jenkin Jones (HMS *Curacoa*) on behalf of Pitcairn residents, Lt. George G. Webber, and on an official tour, Prince Alfred, Duke of Edinburgh (HMS *Galatea*). Lady Robinson used the colonial networks of her husband Sir Hercules Robinson. The Reverends Thomas Powell, William Wyatt Gill and John H.L. Waterhouse were part of an active programme of missionary enterprise in the Pacific during the second half of the 19th century. Other specimens were collected by naturalists Andrew Bloxam, Berthold Seemann and William Hillebrand, while commerce is represented by William Miller Christy, (Stephen) William Silver, of the India-rubber, Gutta-percha, and Telegraph Works Co., and perhaps Donald Rigby Smith.

In this paper we focus on seven collectors with different forms of relationship with Kew, which in part explain the nature of the Kew collection and its usefulness as a resource for rediscovering Polynesian tapa traditions.

Naturalist: Andrew Bloxam

The Rev. Andrew Bloxam (1801-1878) gave his collection of small, cut pieces of tapa to the Museum of Economic Botany in 1856. They were collected in Hawai'i (then the Sandwich Islands) in 1825, under tragic circumstances. King Kamehameha II and his wife Queen Kamamalu travelled to England with the aim of meeting King George IV and reinforcing relations with the British government, arriving on 24 May 1824 (Corley, 2008; Shulman,

Place of Origin	Date of Collection	Collector or Donor	Objects	Barkcloth Publication
Solomon Islands	1876	Lady (Nea) Robinson (wife of Sir Hercules Robinson, colonial administrator)	42959 sheet worn as skirt	
Solomon Islands	Donated 1929	John Henry Lowry Waterhouse (missionary)	42760 3 sheets	
Futuna	Possibly 1950s, donated 1998	Marianne Cribb (wife of Kew botanist Phillip Cribb)	73928 large sheet	
Fiji	Donated 1855	William Grant Milne	42882 demonstration pieces; 42876 2 *masi isala*; 42907 3 clubs for beating barkcloth; 42842 dyed barkcloth	
Fiji	1879-1880, donated 1908	Mary Balfour Smith (wife of Donald Rigby Smith)	42888, 42889 *masi isala* ('turbans'), 42891 *tiputa*	
Fiji	Unknown	Unknown	42956 'sarong'	
Tonga	Donated 1847	Sir James Everard Home, R.N. (Royal Navy, HMS *North Star* and HMS *Calliope*)	43023 large sheet; 42913 *kupesi* (printing board, bearing label from 42914, incorrectly affixed in 19th century)	
Samoa	Donated 1847	Sir James Everard Home, R.N. (Royal Navy, HMS *North Star* and HMS *Calliope*)	42952 and 42861 *tiputa*	
Samoa: Upola	Donated 1844	Unknown (J.E. Home?)	42884 roll of inner bark	
Samoa	Donated 1866	Rev. Thomas Powell (missionary)	42914 *'upeti fala* (printing board, bearing label from 42913, incorrectly affixed in 19th century)	
Samoa	Unknown	Unknown	42863 large sheet; 42905 *tiputa*	
Samoa: 'Upolu	Unknown	Unknown (J.E. Home?)	42887 board and shell for preparing bark	
Samoa	Donated 1878	Collected 1874-78 by Edgar Leopold Layard; donated by Stephen William Silver.	42862 2 large sheets	
Cook Islands: Rarotonga	Donated 1850	William Miller Christy (trader, father of the collector Henry Christy)	42953 large sheet with multi-legged creatures	Hooper, 2006: 224
Cook Islands: Harvey Islands	1852-72	Rev. William Wyatt Gill (missionary)	42978 large sheet	
Society Islands: Tahiti	1869	Prince Alfred, Duke of Edinburgh (royal family)	42947 2 plain *tiputa*; 73328 and 73329 ornamented *tiputa*; 42958 2 sheets and 1 *tiputa*; 42977 'skirt'	Curtis, 2016
Pitcairn	1841	Frances Heywood (wife of Peter Heywood, Bounty mutineer)	42955, made and given by Charlotte ('Little Peggy') to Lieut. Marshall; 42960 2 pieces via Captain Jenkin Jones of HMS *Curacoa* (1841), made by Mauatua ('Mrs Christian') and Teraura ('Mrs Young')	Murray, 1860: 160; Reynolds, 2012; 2016
Hawai'i	1825	Rev. Andrew Bloxam (naturalist on HMS *Blonde*)	42853 6 small pieces; 42885 8 small pieces; 42849 3 *'ohe kapala* (bamboo printing stamps]	
Hawai'i	1850	Dr Berthold Carl Seemann (naturalist on HMS *Herald*)	43736 large sheet	
Hawai'i	Donated 1862	Dr William Hillebrand (naturalist)	42964 large sheet	
Hawai'i	1869	Prince Alfred, Duke of Edinburgh (royal family)	42890 sheet; 42965, 42966, 42967 3 *kapa moe* (bed coverings)	
Hawai'i	Unknown	Unknown	67802 2 small pieces, probably 19th-century	
'Madagascar' but probably Oceania	Donated 1944	Mrs Rathbone	42980	
'South Seas'	Donated 1869	Lt. George G. Webber, R.N.	42979	
	Unknown	Unknown	42864	

Table 17.1. Summary of barkcloth from Polynesia and adjacent regions held at the Economic Botany Collection, Kew.

Figure 17.2. a) Six (of total 14) pieces of tapa from Hawaiʻi, collected by Andrew Bloxam in 1825 (Kew, EBC 42853). b) Black cloth from the funeral of King Kamehameha II and Queen Kamamalu (Kew, EBC 42885). Photographs before conservation.

Shulman and Sims, 2009). Both died of measles in July, and HMS *Blonde* was commissioned to return their bodies to Honolulu (Byron, 1826; Macrae, 1922; Dampier, 1971). The ship arrived there on 6 May 1825, staying for two months. Bloxam was the ship's naturalist, and is known for his bird collections and his diary of the voyage (Bloxam and Jones, 1925; Olson, 1996).

Bloxam had corresponded with Sir William Hooker since 1839, while Hooker was still Professor of Botany at the University of Glasgow. In a letter to Sir William of 1856, Bloxam lamented that parenting six children, as well as parochial and teaching duties, had prevented him from ever visiting Kew; nonetheless he sent Hooker many queries and specimens relating to botany in the English Midlands (DC 36/107).[1] Bloxam's natural history specimens from Hawai'i went in 1826 to the British Museum, now London's Natural History Museum (Berkeley, 1878). However he retained his tapa collection, sending it to Kew (his only gift to the Kew Museum) in 1856 with a brief note. Further information is captured in the Museum Entry Book which also records: 'The sticks show the manner by which patterns were printed on the Tapa'; these are the three bamboo sticks (catalogue number 42849) lacking a donor name in the EBC database. The sticks are stained with pigment, showing that they were used. The Entry Book also notes a 'Curious specimen of Tapa from the Island of Manti, South Pacific', referring to Mauke in the southern Cook Islands. This piece has not yet been found at Kew, but may yet be found in one of the museums that received Kew collections.

14 pieces of Bloxam's tapa remain at Kew, each about 15×10 cm in size (Figure 17.2a). Until recently these were stored loose; they bear no sign of previous mounting on paper. However, in format and style the pieces are reminiscent of those mounted in Alexander Shaw's 1787 compilation, *A catalogue of the different specimens of cloth collected in the three voyages of Captain Cook, to the southern hemisphere*. As with Shaw's original pieces of tapa, cut into pieces to fill at least 60 copies of the book, Bloxam's specimens manifest considerable mobility. Glasgow's City Industrial Museum received at least nine similar pieces via the Linnean Society, while three pieces described as 'Kapa collected by the Bloxam brothers, voyage of HMS Blonde, 1825. Top sheet kapa moi, second sheet, third sheet' were cut up and distributed in Severson's (1978) portfolio.

The 1820s represent a period of significant change in Hawai'i: the consolidation of a single government of the islands by the royal family, the arrival of American missionaries, and increased settlement by traders in response to the whaling and sandalwood industries. The royal visit to England was in part prompted by Hawaiian desires to seek British protection at a time of increased international interest in the islands. Tapa cloth was still widely worn and made in 1825; the publication of the ship's voyage records the wearing of tapa and its use as a bedroom screen. Only one of the Kew pieces has a recorded context: a corrugated, black piece of tapa is recorded in Kew's Museum Entry Book as 'used at the funeral of the King and Queen of the Sandwich Islands' (81.1856; Figure 17.2b). This is doubtless the cloth referred to in Bloxam's journal, 'Wednesday May 11, 1824 … We then proceeded to Karaimoku's house, which was hung with black tapa.… [The coffins were] placed on a platform with black.' (Bloxam and Jones, 1925: 37). The complex designs of these pieces of *kapa*, or Hawaiian tapa, is in contrast to the simpler designs in Shaw's book, demonstrating the impact of the arrival of metal tools in Polynesia, which encouraged the carving of more elaborate designs (Kaeppler, 1975: 11).

1 References to DC are to Directors' Correspondence volume and folio numbers, held in the central Archive of the Royal Botanic Gardens, Kew.

Royal Navy captain: Sir (James) Everard Home

The dedication of volume 73 of *Curtis's Botanical Magazine* is to 'Captain Sir Everard Home, Bart., R.N. who has largely contributed, both to the living collection and to the museum of the Royal Gardens, the botanical results of his long and distant voyages, the present volume is dedicated, with sentiments of regard and esteem by his faithful friend and servant, the author. Royal Gardens, Kew. Dec. 1st, 1847' (Hooker, 1847). The year was that of the opening of Kew's Museum by the writer of this dedication and director of Kew, Sir William Hooker. Home's gift is the third to be recorded in the Museum Entry Books and is described above (EBN 3:1847).[2] Home (1798-1853) was the son of Sir Everard Home, distinguished surgeon and pupil and brother-in-law of John Hunter, whose collection formed the basis of the museum of the Royal College of Surgeons. Although Home was sent away to naval college at the age of 12, his family environment was one of science and scholarship, and he was elected as Fellow of the Royal Society in 1825 at the age of 27.

After service in the West Indies, Home commanded the *North Star* during the Opium Wars in China (1841-6), and in the Flagstaff War (First Māori War) in Aotearoa New Zealand, 1845-6. In 1850 he captained HMS *Calliope*, sailing in Australian and Aotearoa New Zealand waters. He is said to have returned to the southern hemisphere 'to mature certain philanthropic views which he entertained in reference to the races of the South Sea Islands' (Anon., 1853). The Kew tapa pieces match two episodes recorded from his 1844 voyage in the Pacific, described by Home in the *Nautical Magazine* (Home, 1849-1850). The ship sailed from Sydney, travelling to Norfolk Island, Tongatapu (the main island of the kingdom of Tonga), the northern Tongan island of Vava'u, then the island of 'Upolu in Samoa, and thence to Aotearoa New Zealand. Home was struck by the high demand from islanders for European clothing, and thus the potential for trade, and perhaps as a result paid special attention to indigenous clothing. In Tongatapu he describes:

> plantations… of yams, and the paper mulberry. From the bark of the latter, taken when the stem is about three inches in diameter, the cloth is made by which both sexes are clothed; it is called tapa. After it has been soaked in water it is laid upon a log of wood formed like the wooden axletree of a large cart, the extremities of which are supported from the ground by three pieces of wood, two parallel to each other, and one across; the ends of the log are laid upon the cross pieces which raise it three or four inches from the ground; the bark is beaten by the women with an instrument made with heavy wood like a rolling pin, only it is square: the beating commences at daylight, and continues without ceasing until 3 p.m., unless they are working against time, such as a marriage or some such events: the noise is loud and musical, they keep time in beating: there are usually two or four beaters in every house at work, so that the women of Tonga make more noise than any in any place I ever visited before. The breadths are pasted together with paste made of the flour of arrow root or taro; when dried it is printed; the pattern is devised by the king's family, principally from our cotton prints; the type or pattern is raised upon the leaf of the pandanus, and contrary to other prints the side which receives the stamp is the reverse side. King Josiah Tubo to shew what could be produced had a piece of cloth made

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2 References to Museum Entry Books and Entry Book Numbers (EBN) therein are to the series of accession registers held by the Economic Botany Collection at Kew.

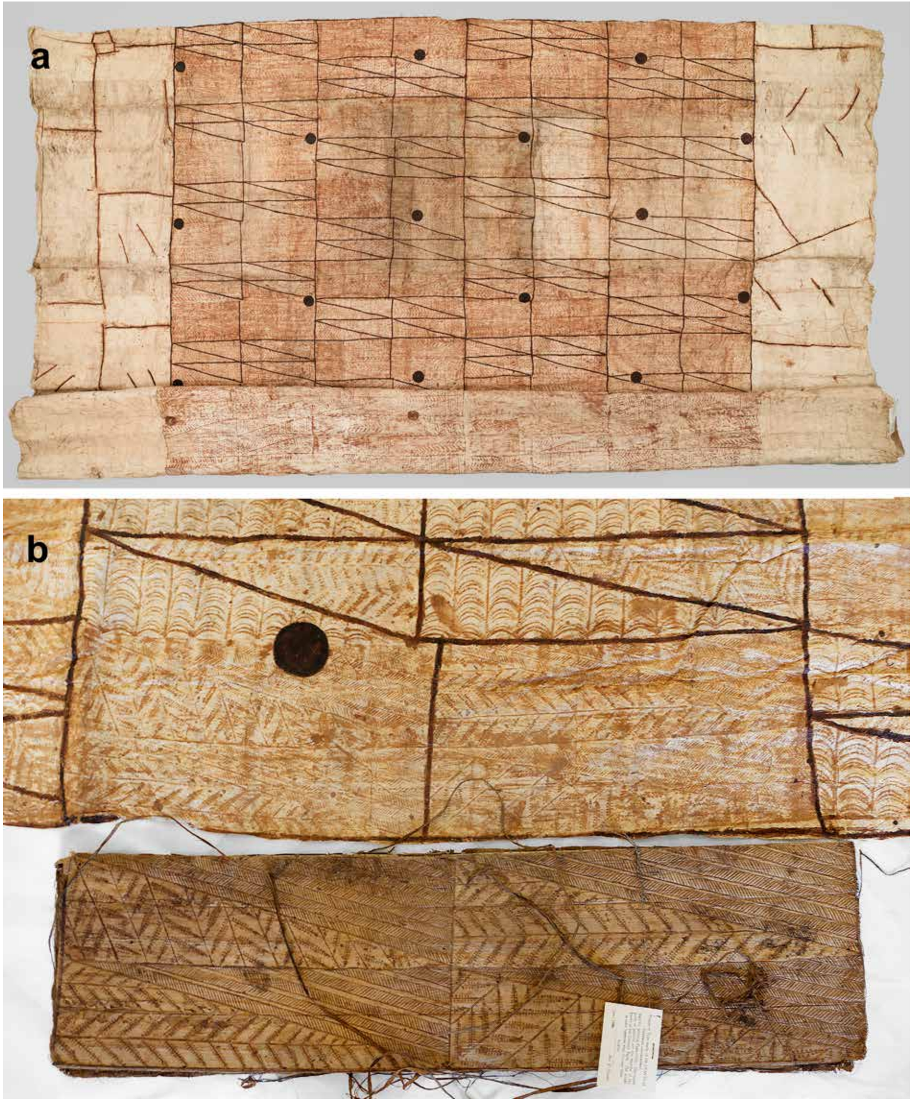


Figure 17.3. a) Tongan ngatu labelled 'Portion of a piece two miles in length and 120 ft wide, which was made for King Josiah Tubo' (Kew, EBC 43023) after conservation. b) *Pandanus kupesi* (printing board) shown next to the matching pattern of ngatu (Kew, EBC 42913) before conservation.

> which was two miles in length and 120 feet wide; when made it was necessary to spread it and the ground had to be cleared to spread it upon. There was a great feast of pigs and yams; when the first piece was cut off, it was all distributed (Home, 1849: 583).

On a visit to the Tu'i Tonga (sacred king, Tu'i Tonga Laufilitonga), 'he was dressed with an enormous piece of new tapa which left little exposed below the arms, and almost covered his legs; he had no ornaments, and did not move when we entered. Mr. Thomas [Rev. John Thomas of the Methodist Missionary Society] was the interpreter. Some of the gentlemen from the ship accompanied me. A large wooden drum was brought for me to sit upon, but

Figure 17.4. Collected by Captain James Everard Home, Samoa, 1844: a) Tiputa, 224cm x 87cm (Kew, EBC 42861). b) Wooden board and shells for extracting inner bark (Kew, EBC 42887).

I preferred the ground; the only native near him was an old woman, simply dressed, who sat by his knee. He had prepared as a present two spears, a club, a piece of cloth and a mat, being I suppose, all that is necessary for apparel, defence, and rest; he said "He knew we did not drink kava," but asked if I would have some made, which I accepted' (Home, 1849: 585).

Home's donation to Kew includes a large sheet of *ngatu* (the Tongan term for tapa), measuring 540cm x 470cm and labelled, 'Portion of a piece two miles in length and 120 ft wide, which was made for King Josiah Tubo' (EBC 43023; Figure 17.3a), and part of a *Pandanus* '*upeti fala* (printing board, EBC 42913; Figure 17.3b), labelled 'Used to print the pattern on Tapa cloth (example of which is included in the collection)', and matching part of the pattern of the large sheet. These items were surely also collected in 1844, in view of the reference to this specific barkcloth and 'upeti fala in Home's account.

On 'Upolu, Samoa, Home noted that 'The women wear their tapa garment in the same way as the Mexican wears his poncho. The head is put through a hole in the centre, and the cloth hangs down before and behind. I am assured that this is the original native mode of wearing it: in grown-up persons this seldom falls below the waist. The stores of the firm established here, furnish neat and sometimes gaudy dresses, which are displayed particularly on Sundays…' (Home, 1850: 221). Two Samoan tiputas are recorded as donations from Home (EBC 42952; 42861; Figure 17.4a), again probably collected in 1844.

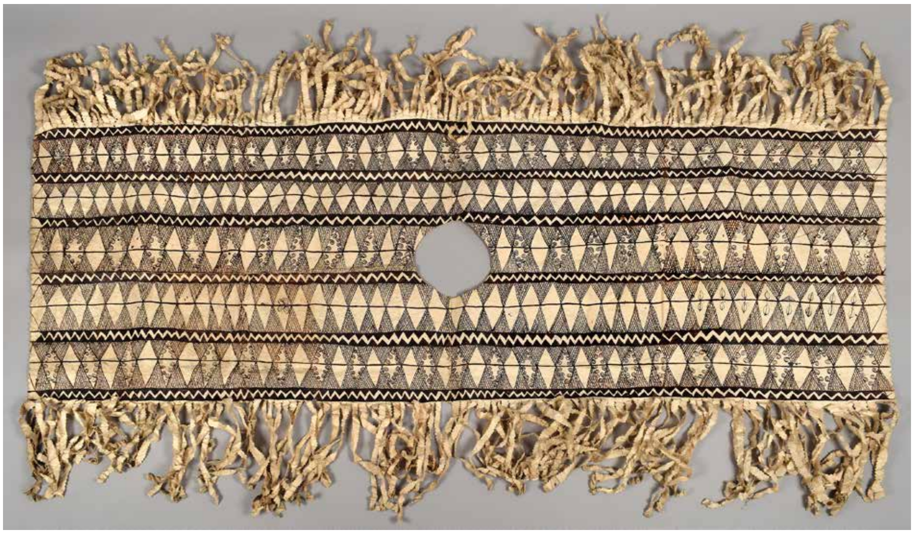


Figure 17.5. Tiputa from Samoa, collected 1845-1866 by Thomas Powell, 198cm x 113cm (Kew, EBC 42905).

A further three pieces lack donor names but can probably be assigned to Home: a roll of inner bark from ‘Upolu, dated 1844 (42884), and a board and shell for preparing bark from ‘Upolu (42887; Figure 17.4b), matching Home’s description.

Missionary: Rev. Thomas Powell

Thomas Powell (1809-1887) was a missionary for the London Missionary Society on Tutuila, the largest island in American Samoa, for much of the period 1845-88. He published a series of works on botany and ethnography, and donated herbarium specimens to Kew. Among several donations to the Kew Museum, the tapa pieces were donated in 1866 when Powell returned on a visit to London. 18 objects are listed in the Museum Entry Book (EBN 17:1866), incorrectly as ‘Sandwich Islands’ (Hawai‘i), but in fact all from Samoa. They include an ‘Entire dress of Tapa Cloth, *Broussonetia papyrifera* and beaten bark of the same’ and ‘Frame for printing tapa cloth’, alongside sandals, seeds, oil, matting and other items.

The bark specimen does not survive, but the frame and two items of dress (both labelled as given in 1866) do. The frame (42914) is labelled ‘Made from the leaves of *Pandanus odoratissimus* used for printing Tapa cloth. The raised parts or pattern are the midribs of the leaves of the coconut palm. The whole is sewn together with coconut fibre.’ The items of *siapo* (the Samoan term for tapa) are both in the form of tiputa (EBC 42952; 42905; Figure 17.5).

Physician and botanist: Dr William Hillebrand

William (Wilhelm) Hillebrand (1821-1886) was deeply involved in the public affairs of Hawai‘i for 20 years. Born in Prussia, Hillebrand qualified as a doctor, practising medicine briefly in Australia and the Philippines before arriving in Honolulu in 1850. He was soon a key figure on the islands, becoming physician to the royal family and chief physician of the Queen’s Hospital. At the same time, he built on his long-standing interest in botany by collecting plants as the basis for a flora of the islands, and promoting the importation of plants and labourers to develop Hawai‘i ’s agriculture (Meier, 2005).

Figure 17.6. Large piece of Hawaiian kapa, 308cm x 241cm, with ʻ*upena pupu* beater marks seen in close-up view (Kew, EBC 42964). Sent to Kew in 1861 by William Hillebrand.

From 1853 he developed his own botanical garden surrounding his home in Honolulu, today the Foster Botanical Garden.

The main record of Hillebrand's botanical work is his letters to William and Joseph Hooker at Kew. Many living plants were exchanged between Hillebrand and Kew, and Hillebrand also sent as complete a set as possible of his herbarium specimens. His *Flora of the Hawaiian Islands* (1888) was published posthumously and has been described as a 'classic work' and the 'first true manual' for the botany of any country within Oceania (Frodin, 2001). Hillebrand collected only a few specimens for Kew's Museum of Economic Botany. In a letter accompanying a parcel of dried specimens sent on 14 December 1861, he writes:

> in former times our natives used to prepare their cloth from various species of *Procris* [now *Pipturus albidus*] (mamake), *Neraudia* (maaloa), *Broussonetia* (wauke), and *Urtica* [*Boehmeria*]. I do not know, to what extent the cultivation of any plant could enter into competition with the rag trade of Continental Europe for the purpose of papermaking, but as two of those plants, the *Procris alba* and *Broussonetia* grow here in great abundance and could, without great labor or expense be multiplied almost indefinitely, I should gladly see them turned to some account for increasing the prosperity of this country. You will find a sample of wauke kapa with the plants… (Meier, 2005: 91; DC 75, 83).

This is a rare reference to the range of fibre plants used for making kapa, and an important indicator to researchers of the species beyond *Broussonetia* that were used in Hawaiʻi.

The kapa was indeed received at Kew on 27 June 1862 (Catalogue Number 42964; Entry Book 69.1862). It is a large uncoloured piece, measuring 308 by 241 cm, and showing the ornate beater mark known as the pipped net pattern or *'upena pupu (*Figure 17.6). This is one of a series of elaborate beater marks typical of 19th-century kapa, as with Bloxam's collections in part reflecting the new availability of metal tools that enabled more elaborate carving of beaters.

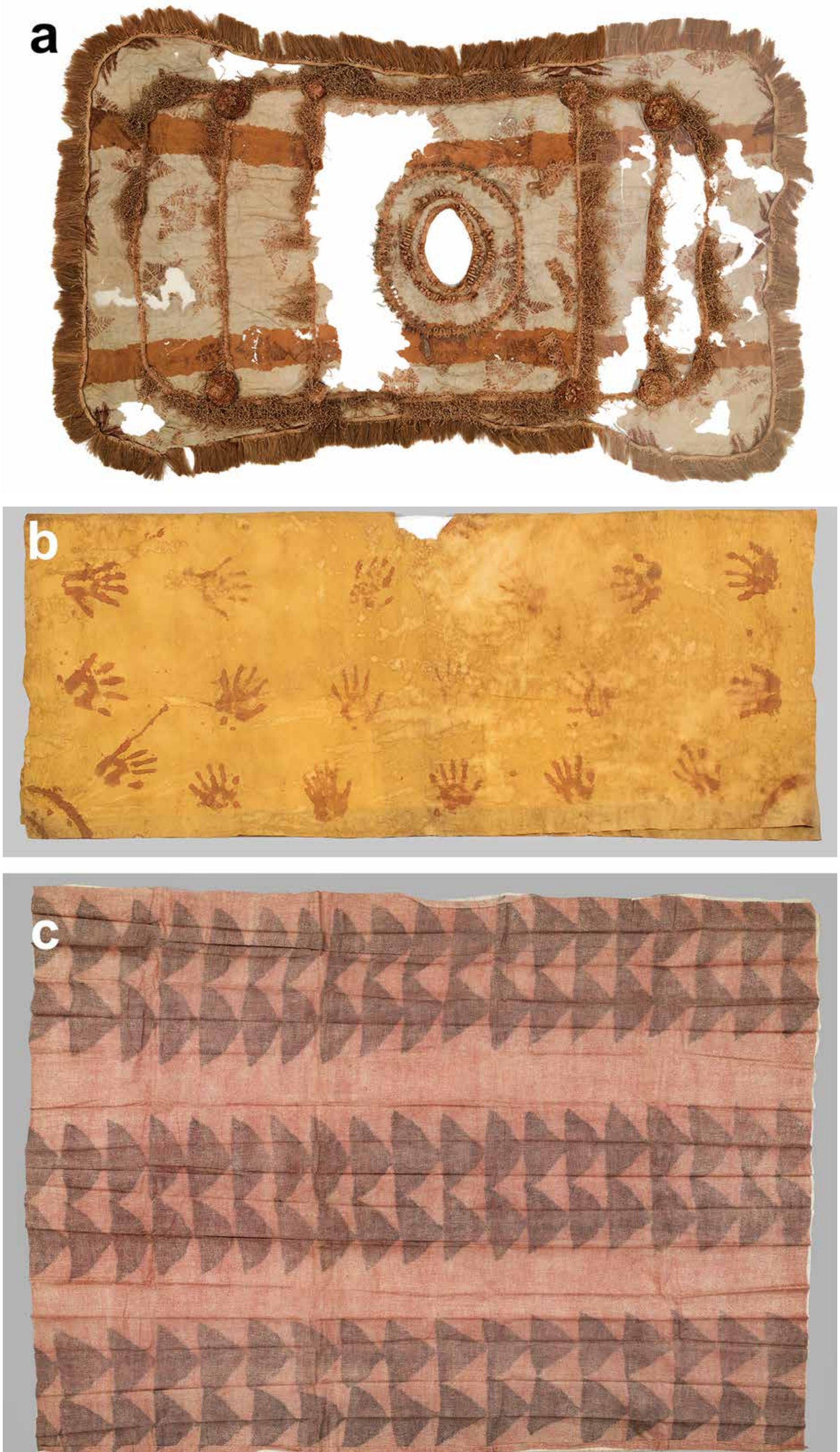
Royal visitor and naval officer: Prince Alfred, Duke of Edinburgh

Prince Alfred, Duke of Edinburgh (1844-1900) was the second son of Queen Victoria. Between 1867 and 1871 he captained HMS *Galatea* on a round-the-world voyage (McCreery, 2008; 2009; Mitchell, 2010). In June and July 1869 HMS *Galatea* visited Tahiti and Hawai'i. During these visits Prince Alfred was given an exceptional assemblage of Pacific dress, now poorly known to scholars and the Pacific community alike, and dispersed between several museums in the United Kingdom (Curtis, 2016).

From contemporary accounts, there were two official events in Tahiti during which Prince Alfred most likely received gifts. On June 22nd, there was a 'grand demonstration, on the part of the native population' at the palace of Queen Pōmare IV ('Aimata Pōmare IV Vahine-o-Punuatera'itua) with the 'most influential chiefs and representatives of the people of the island assembled' (Anon., 1869a; Anon., 1869b; Anon., 1869c). During the ceremony, the queen sat on a throne with Prince Alfred on her right and the French Governor on her left, while 'the natives' walked past paying 'homage' to Prince Alfred and the Queen (Anon., 1869b; Anon., 1869c). 'According to the custom of the country' the chiefs 'divested themselves of their mantle, head dresses, and jewelry, and presented them as offerings of goodwill and friendship to the Duke' (Anon., 1869b; Anon., 1869c). During this event Prince Alfred wore a tiputa elaborately decorated with trimmings that 'twisted and hung over the shoulders,' and would have been one of the seven tiputas donated to Kew in 1874. The second presentation occurred on the last Thursday of Prince Alfred's visit; although no tapa was explicitly mentioned, Tahitians came to the palace and gave Prince Alfred 'various offerings, which, according to the native usage, consisted of cocoanuts, bananas, poultry, and suckling pigs!' (Anon., 1869a). Prince Alfred was also given objects, possibly including tapa, while visiting the Brander family, relatives of Queen Pomare IV (Krizancic, 2009: 160).

In Hawai'i Prince Alfred was received by King Kamehameha V. During his stay, native Hawaiians paid him *ho`okupu*, an already 'old fashioned [...] custom of paying tribute by the presentation of gifts' (Taylor, 1922: 99). They came to the residence he had been provided in 'the number of several thousands at a time' and each presented him with a small gift (Anon., 1869d; Bennett, 1869: 65). The Hawaiian people gave Prince Alfred fruits, vegetables, animals such as pigs and fowl, necklaces, 12 bullocks, and 'native mats', which were probably barkcloth pieces (Bennett, 1869: 65; Taylor, 1922: 99). These gifts of tapa, in both countries, form part of a wider Pacific practice of symbolic gift exchanges intended to build and cement relationships (Thomas, 1991). On arrival in London in 1871, Prince Alfred's Pacific gifts became subject to further elements of

Figure 17.7 (right). Collections by Prince Alfred, HMS *Galatea*, 1869. Two tiputa from Tahiti: a) with fringe (Kew, EBC 73229); b) with hand prints (Kew, EBC 42947). c) Kapa from Hawai'i: red and black *kapa moe* (bed covering, Kew, EBC 42967).


a
b
c

display and gift. 784 objects, including 19 from Hawai‘i and Tahiti, were exhibited at the South Kensington Museum (now the Victoria and Albert Museum) under the title ‘Five-years’ cruise round the world’. At the close of the exhibition ‘a Collection of Vegetable Tissues and Fibres, acquired during the Voyages of His Royal Highness’ was offered to Kew (MacLeod, 1874). Of about 77 head-dresses and tapa clothing transferred to Kew, 12 remain in the Economic Botany Collection. The remaining pieces were distributed as ’duplicates’ to other museums, either as part of Kew’s extensive distributions (more than 60,000 economic botany specimens) during the period 1847-1914 (Cornish and Driver, 2019), or in the mass dispersal of c. 2500 ethnographic objects to the British Museum, Pitt Rivers Museum and Horniman Museum that took place in 1959-1961. The earlier recipients include the National Museum of Scotland and Warrington Museum; the current location of about 50 pieces is still unknown.

The importance of the Galatea collection is two-fold: first, the depth of documentation from memoirs and newspaper accounts detailing the circumstances of gifting, and second, the precision of their time and place of acquisition, although this was obscured when the collection was accessioned at Kew as being entirely from the Sandwich islands (Hawai‘i). The explicitly royal and chiefly nature of the Tahiti presentations is visible in the highly ornate decoration on some of the tiputas (EBC 73229; Figure 17.7a). Although manufactured, woven cloth had replaced tapa for everyday dress by 1869, tapa was still being worn by upper class women due to the Queen’s preference for native materials rather than European ball gowns. Clothing is a visible way of marking identity and political allegiance, and Tahitian queens had a history of utilising tapa and European dress to make points about political power. Queen Pomare IV insisted on wearing tapa and only speaking Tahitian, in order to communicate her dislike of the harsh and oppressive French colonial rule (Hort, 1891; D’Alleva, 2005). Among these gifts are simple tiputas (EBC 42947; Figure 17.7b).

Far fewer objects were acquired in Hawai‘i. Three *kapa moe* (bed covers) at Kew are, in their overall form, comparable to others, but have a thin, almost paper-like texture and glossy surface (EBC 42967; Figure 17.7c). One bears a label ‘Tapa from imported Mulberry tree, Honolulu’. The relatively late date of this kapa – which does not bear any signs of use, so may have been made shortly before the Prince’s visit – raises the possibility that both the raw material and the manufacturing techniques may have changed in response to external influences. Brigham (1911: 3) noted that ‘When in 1864 the writer came to these islands kapa was worn only in the outlying districts, and only the plainer forms were made… In 1890, when the Bishop Museum was opened, the manufacture and use (with such exceptions as we shall find later) had ceased’. The Galatea collections of 1869 thus represent the final stages of kapa making as a widespread phenomenon in the islands.

Naturalists on board HMS *Herald*: William Grant Milne and Berthold Seemann

The Royal Navy ship HMS *Herald* surveyed the South Pacific between 1852 and 1861, under the command of Sir Henry Mangles Denham. The ship’s botanists were John MacGillivray (dismissed from the ship in 1855) and William Grant Milne (1829-1866). Milne trained as a gardener at the Royal Botanic Garden, Edinburgh. He kept an extensive correspondence

Figure 17.8. Two of four stages of *masi ni sala* (head-dress barkcloth) making collected on the island of Bau, Fiji, by William Grant Milne on HMS *Herald*, 1855. Upper: Stage 1, separated inner bark; Lower: Stage 2, beaten bark (both Kew, EBC 42882). Stage 3 is missing; Stage 4, not shown, is a complete head-dress (Kew, EBC 42882).

with Sir William Hooker during the voyage, resigning as botanist in 1856 in a dispute over the quality of his specimens (David, 1995: 311-312).

Milne wrote to Kew on 4 December 1855, describing how on the island of Bau, Fiji, '[I] obtained specimens of this cloth in all its stages' (DC 74, 320), the stages being:

> 1st stage of native cloth. The bark is taken from the tree, soaked in water for a short time, and then slightly beaten out. When a portion is thus prepared they go on with the 2nd stage, which makes head pieces for the chiefs. The native name of the cloth is 'Mossee', it is all made by women, and will not stand washing or rain. 2nd stage of

native cloth which they call head pieces for the chiefs; not for common men. 3rd stage of native cloth (a good specimen). This is used for wearing round the waist by men, women and children. I. of Augeau (Gau). 4th stage of native cloth (a good specimen). Dyed or printed. I. of Augeau. (EBN 83: 1855).

The samples (42882; Figure 17.8) are of the extracted inner bark, and the bark after its first beating into long narrow strips. Two examples of completed head-dresses (*masi isala*, 42876) are the '4th stage'; the third stage does not survive in the Economic Botany Collection. Other items from Milne include a specimen of dyed *Broussonetia papyrifera* bark labelled 'Dyed with a species of Turmeric' from Ovalau Island, Fiji (42842), and three tapa beaters (42907) labelled 'Made from the wood of Casuarina equisetifolia, used by the women of Nakaki'.

Milne also sent two examples of '"Sigue", part of a woman's dress made of Mossee or native cloth. The strings are made of bark of *Broussonetia papyrifera* dyed red. Made by women. I. of Ovalau.' One example, 'dyed different colours' is 'used by chiefs only.' It was transferred to the British Museum in 1960 and might be the object catalogued there as Oc1960,11.69.

HMS *Herald* had previously surveyed the west coast of North America and parts of the Pacific and southeast Asia, in the years 1847-1851 under the command of Sir Henry Kellett. On this voyage Berthold Seemann (1825-1871), a Kew-trained botanist, was one of three ship's naturalists. Kew holds one piece of kapa collected by him, collected when the ship stopped in Honolulu from 14-30 October 1850 (EBC 43736). This large undecorated sheet measures 260 by 198 cm and is a rare example of kapa made from *māmak*i (*Pipturus albidus*).

Conclusions

Re-evaluation of the Kew tapa collection has enabled specimens to be reconnected to collectors, locations and dates. The pattern of collecting reinforces previous appreciation of the highly diverse routes through which Kew's collections arrived. Also of interest is the tendency to collect in 'illustrative series', thus including raw materials and tools, from the earliest collections of 1844, as well as in later periods when this had become firmly established as a form of museum display.

However, the greatest significance of improved documentation is the collection's enhanced utility as a record of past tapa traditions, and as a potential resource for the revival of lost practices. Not only are these mostly well-dated collections, but in some cases there are lengthy eye-witness accounts of the moment of acquisition. The value of the objects is enhanced by the dye and fibre analyses carried out as part of the *Situating Pacific Barkcloth* project (Flowers, Smith and Brunton, 2019; Smith, Holmes-Smith and Lennard, 2019). We have not described here the tapa pieces made by Pitcairn islanders and which have been visited at Kew, and studied by Pauline Reynolds (2012), a descendant of one of the makers (Chapter 14). The enhanced documentation of the Kew barkcloth collection will surely support many more similar interactions between Kew collections and the source communities from which they came up to 200 years ago.

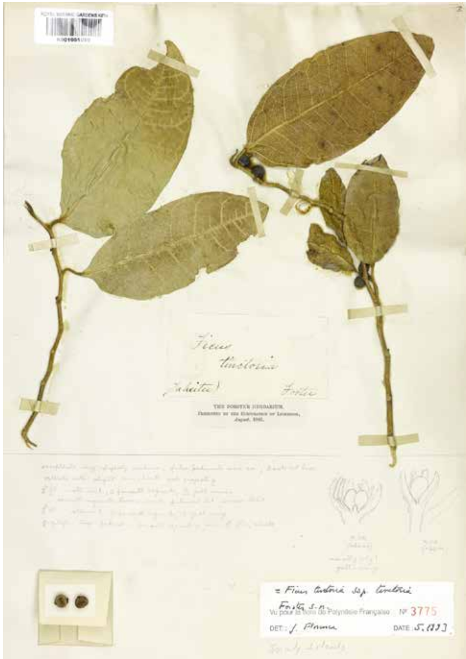
Acknowledgements

We are grateful to Sharon Steadman, whose 2002 internship report on Kew's tapa collection has formed the basis of further work. Curtis's work formed part of her Museum Studies MA dissertation at the Institute of Archaeology, University College London, co-supervised by Rodney Harrison.

~ Plant Profile 13: Red dye, fibre ~

Mati *Ficus tinctoria* G. Forst. MORACEAE

Mark Nesbitt



Left: Coloured engraving by Gabriel Smith, based on HMS *Endeavour* voyage specimen from the Society Islands, 1768-71 (Natural History Museum, London).
Right: Johann Forster, Tahiti, Cook's second Pacific voyage, 1772-5 (Kew, K001051059).

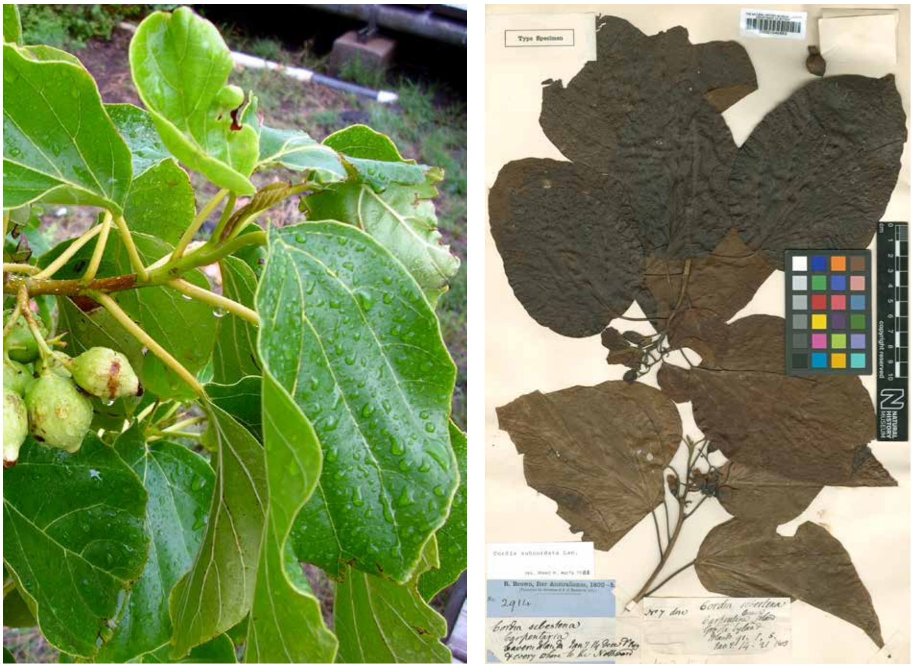
Mati has a very wide native distribution, from India to Australia and encompassing western and central Polynesia, and thus not Hawai'i. It is native to the high islands of Polynesia and possibly an ancient introduction to the atolls. It is a medium tree, to 8 metres, sometimes occurring as a strangler. The fruits are edible and also the source of a red dye used in the Society Islands, Austral Islands, Cook Islands and Hawai'i (Chapter 5). The milky latex is squeezed from the fruits and squeezed with leaves of tou (Plant Profile 14) or *Solanum ferox* to make a red dye. There are also scattered records of the use of its inner bark as a high quality barkcloth fibre in Tahiti and other islands (Chapters 1, 3).

Vernacular names (selected): Tonga: *masi'ata*; Niue: *'ata*; 'Uvea: *masi*; Samoa, Futuna, Cook and Society Islands: *mati*; Fiji: *baka*.

~ Plant Profile 14: Red dye ~

Tou *Cordia subcordata* Lam.
BORAGINACEAE

Mark Nesbitt



Left: Fruits at Honokanaia, Kahoolawe, Hawai'i.
Right: Robert Brown 2914, Australia, 1803 (Natural History Museum, London, BM001040653).

Tou is a medium-sized tree to 10 metres high. It is native over a large area on the rim of the Indian Ocean, from east Africa to India and southeast Asia and Australia. It is native to much of Polynesia, but may have been distributed to some islands in ancient migrations. It is most valued for its soft but durable wood. The leaves do not contain a pigment, but react with the milky latex of mati to form a red dye (Plant Profile 13; Chapter 5).

Vernacular names (selected): Tonga: *puataukanave*; Samoa: *tauanave*; 'Uvea, Futuna: *kanava*; Niue: *motou*; Society and Cook Islands: *tou*; Hawai'i: *kou*; Fiji: *nawanawa*.

~ Plant Profile 15: Red dye, wood ~

Ironwood *Casuarina equisetifolia* L.
CASUARINACEAE

Mark Nesbitt

Left: Tree at Finger Piers Sand Island, Midway Atoll, Hawai'i.
Right: David H. Lorence 6206, Fatu Hiva, Marquesas, 1988 (National Tropical Botanic Garden, PTBG1000047212).

Ironwood is native in a broad swathe from India and southeast Asia to Australia. It may be native to islands in western Polynesia, such as Tonga, and was introduced in ancient times to much of eastern Polynesia, but probably introduced to Hawai'i in the 1880s. It is a fast-growing tree that can reach 20 metres in 12 years. It is a heavy, hard wood that makes excellent timber and fuelwood, but is hard to carve. In the Cook Islands, Society Islands and Austral Islands a red dye was extracted from the sapwood of the tree (Chapter 5). The wood was used on many islands for making tapa beaters.

Vernacular names (selected): Tonga, Samoa, Niue, 'Uvea, Futuna, Cook Islands: *toa*; Society Islands: '*aito*; Fiji: *nokonoko*.

18

Smithsonian Institution Barkcloth Collections

Adrienne L. Kaeppler

The Smithsonian Institution in Washington, DC, is home to more than 1100 pieces of barkcloth. Most of these are in the Anthropology Department in the National Museum of Natural History; some are in the Textile Collection of the National Museum of American History, most of which were transferred from Natural History. The Anthropology Department's pieces are entered on the Department website; photos are included if they are available (National Museum of Natural History, Smithsonian Institution, n.d.). The National Museum of the American Indian has barkcloths from the Americas, and the National Museum of African Art also has barkcloth. Even the Cooper Hewitt, a Smithsonian Museum in New York, has about 30 pieces of barkcloth. The collections are from various places in the world, with the largest number from Polynesia, which is the focus of this entry.

In the Anthropology Department, there are more than 700 pieces of barkcloth from the Pacific, only a few of which are from Melanesia and New Guinea. Although Fiji is sometimes considered to be Melanesian, it will be included here with Polynesia, as barkcloth from this area is closely related to that of Tonga, ʻUvea, Futuna and Samoa.

Polynesia

The largest collection, about 655 barkcloth pieces, comes from Polynesia. The most important collection of barkcloth in the Smithsonian, especially for Polynesia, comes from the United States Exploring Expedition (Kaeppler, 1985), which includes about 184 pieces. The Expedition, led by Lieutenant Charles Wilkes in 1838-1842, was the first international hydrographic and scientific survey undertaken by the US government. The squadron of ships circumnavigated the globe under sail, surveyed and charted nearly 300 islands of the Pacific, mapped 800 miles of the coast of Oregon, and confirmed the existence of Antarctica as a continent. The expedition included scientists and artists, as well as Navy personnel. The thousands of objects and specimens brought back on the expedition became one of the founding collections of the Smithsonian Institution. The collection documents most of the world the expedition explored, including North and South America, Asia, Australia, Aotearoa New Zealand, Hawaiʻi, Samoa, Tonga, and Fiji and numerous other Pacific island groups.

in: F. Lennard & A. Mills (eds) 2020: *Material Approaches to Polynesian Barkcloth. Cloth, Collections, Communities*, Sidestone Press (Leiden), pp. 251-260.

A handwritten catalogue of the expedition's collection of ethnographic and archaeological artefacts amassed during the four-year voyage was compiled in the 1840s by two members of the scientific corps, Titian Ramsay Peale and Charles Pickering. The original catalogue, *Collections of the United States South Sea Surveying and Exploring Expedition, 1838, 9, 40, 41, & 42* (often cited as the Peale catalogue in the database) can be found in the Department of Anthropology's National Anthropological Archives (Peale, 1846). This manuscript has been digitised and is available online.[1] Objects given the original accession number consist of pieces definitely collected by the expedition, with identified numbers from the Peale catalogue (referred to as Peale numbers, these numbers are listed as field numbers in the database.) Other objects only tentatively identified as part of this collection have sometimes been given this accession number, to facilitate research. These tentatively identified objects do not have Peale/field numbers listed in their records. The collection was first catalogued and exhibited in the Great Hall of the Patent Office during the 1840s. In 1858 it was transferred by order of the United States Congress to the Smithsonian Institution. The collection was not catalogued until 1866, and was not completed until the 1870s. The shipping lists and bills of lading presented to the government by numerous sailing vessels carrying the expedition's collections are housed in the Smithsonian Institution Archives.

US Exploring Expedition material is also found in the Departments of Botany, Vertebrate Zoology, and Invertebrate Zoology at the National Museum of Natural History, and the National Museum of American History. See the Smithsonian Libraries website on the expedition (Smithsonian Libraries, n.d.) and in particular http://www.sil.si.edu/digitalcollections/usexex/learn/Walsh01.htm for much good information on the expedition and the objects collected on it, as well as digitised versions of the expedition publications.

Cook Islands

From the Cook Islands there are 16 pieces from the end of the 19th century (Chapman-Mason, 2017). Recent pieces are from Jean Chapman Mason and Nancy Moeauri, participants in the Smithsonian barkcloth project, and those made for the Glasgow breadfruit expedition undertaken by Kaeppler and Austin Dennehy in 2018 (see Chapter 3). The 16 early pieces from the Cook Islands are from the island of Aitutaki (Figure 18.1); they were collected by Charles H. Townsend and H. R. Moore of the US Fish Commission while on board the *Albatross* during its voyage to the Pacific Islands in 1899-1900. Funds were appropriated by the Smithsonian for Townsend and Moore to acquire collections on the voyage; they collected in Fiji, Cook Islands, Tonga, Tahiti, and other islands. The collection includes many pieces of barkcloth and associated materials. The NMNH Dept of Invertebrate Zoology has digitised several resources related to the Albatross expeditions (http://invertebrates.si.edu/albatross/albatross_resources.cfm).

1 NAA MS4807. It is available from either http://collections.si.edu or http://sirisarchives.si.edu. It was also transcribed through the Smithsonian Transcription Center: https://transcription.si.edu/project/6600.

Figure 18.1. Community Scholar Nancy Moeauri vacuuming barkcloth from Aitutaki, Cook Islands during the Smithsonian Barkcloth Project, 2013. The cloth was collected by Townsend and Moore of the US Fish Commission Expedition in 1899-1900 (Department of Anthropology, Smithsonian Institution).

Easter Island, Rapa Nui

There are two accessions of barkcloth from Rapa Nui. One includes eight small white pieces collected in 1886 by William Thomson on the voyage of USS *Mohican*. The other includes pieces made for Kaeppler in 1984 by Community elder, Kiko Pate.

Fiji

The Fiji barkcloth collection is one of the most important in the world. It consists of more than 100 pieces; the largest part is from the US Exploring Expedition (Kaeppler, 2018). There are more than 76 pieces from this collection, many of them well documented as to collector and place of collection (Figure 18.2). Some are from the Lau Islands, and many are difficult to separate from Tonga, with which they share many cultural traits. Six pieces are from Townsend and Moore from 1899-1900 (see above under Cook Islands). Other pieces are contemporary, such as the long strips used to dress the Fijian mannequin in the recent *Objects of Wonder* exhibition (Figure 18.3), which were purchased at the market in Suva in 1985.

Hawai'i

Hawai'i is well represented in the barkcloth collection, with about 100 pieces. At least 32 are from the US Exploring Expedition. Other collectors and donors include Mrs Mary M. Walcott, two pieces in 1931; Princess Abigail W. Kawananakoa, one piece in 1947; Mrs Norman D. Dole, 12 pieces in 1949; Brigadier General Lester D. Flory, one piece in 1965; US Navy Lieutenant William Edwin Safford in 1888 through J. S. Emerson, four pieces, one coloured with turmeric, and one combining *pa'iula* (beaten in red fibres) and bluing balls (used by missionaries for whitening sheets); Elizabeth Rasmussen (a descendant of

Figure 18.2. Detail of barkcloth from Fiji (*masi*), collected on the US Exploring Expedition (Department of Anthropology, Smithsonian Institution, E3291).

Figure 18.3. Fijian mannequin dressed in masi collected in the Suva market in 1985. *Objects of Wonder e*xhibition, National Museum of Natural History, 2018 (Department of Anthropology, Smithsonian Institution).

Nancy Ruggles, a missionary from 1820 to 1834), four pieces given in 1993; and Elsie S. Kawaonaheieopaiʻi Durante, one piece in 2005.

The Smithsonian barkcloth project carried out research and ran experiments with DNA, fibre analysis, X-ray fluorescence (pXRF) and dye analysis, and investigated the addition of indigenous oils. DNA is especially difficult because of the methods of Hawaiian manufacture, including extreme beating, fermentation, and the addition of paint or dyes, all of which cover and change the original cloth. In addition, a rather large piece is needed for analysis, which is usually not allowed with historic barkcloth. We tried to ascertain if the barkcloth was made of paper mulberry or *māmaki* (*Pipturus albidus*), two plants that were traditionally used to make Hawaiian barkcloth, or other plants, such as breadfruit. Some tentative conclusions were made, but a lot of research remains to be done (Kaeppler, 2017c; Hansen, 2017; Moskvin, 2017; Austin Dennehy, 2017).

Marquesas

Among the ten barkcloth pieces attributed to the Marquesas, the earliest piece is from before 1840, collected perhaps in 1837 and given by Captain John H. Aulick. John H. Aulick of Winchester, Virginia, was in the US Navy from 1809 until 1853. He served on several ships that visited Pacific Islands, including the USS *Enterprise, Saranac, Ontario, Constitution, Brandywine,* and the *Vincennes* in 1847. Another is from the US Exploring Expedition from about the same time. Two pieces from 1922 are attributed to Mrs Henry Stockbridge, and three pieces from 1961 attributed to Mrs Earle S. Wallace. Two pieces were collected by Smithsonian scientists Harold Rehder and M. H. Sachet, probably in the 1960s and 1970s. Five recent samples were purchased from their makers at the Tapa Festival in Tahiti in 2016.

Niue

There is only one barkcloth that may be Niuean. It was collected in Samoa about 1890. Although the designs on this barkcloth are also found on Samoan barkcloth, they are more characteristic of Niue (Figure 18.4). The donor Carol Clark inherited it from her late husband, Charles Percy Parkhurst, Jr; he acquired it from his uncle, Commodore Benjamin Warner Wells, Jr, who is said to have collected it in Pago Pago.

Samoa

The Samoan collection of barkcloth (*siapo*) is the largest in the Anthropology Department, having some 325 pieces. The US Exploring Expedition part of the collection includes about 40 pieces (Figure 18.5). This is a wide-ranging and very significant collection, in that it shows what kinds of manufacture and designs were important during this period of time. They range from freehand designs to designs using an *'upeti* design board. A few are very large, with turmeric added as an undercolour. The collection has been studied by a number of people, including Reggie Meredith, a participant in the Smithsonian barkcloth project, who has added her understanding of the designs on some of the cloths (Meredith and Fitiao, 2017).

A second important collection was assembled by Colonel Albert B. Steinberger in 1875 (Kaeppler, 2005a). The six pieces are large and elegant, of a sort usually given to an important person. Steinberger was appointed as a special agent of the US government by President Ulysses S. Grant in 1873 to visit and report on Samoa. He arrived in August 1873 and submitted a comprehensive report, returning to America in December 1873. He returned to Samoa on 1 April 1875 with a letter from the president that he was to become the American Consul of Samoa. Steinberger met with King Malietoa, and was soon appointed premier by him. Other Europeans despised the American, and a revolt against him started to brew. The whole affair came to a violent head. The Europeans, backed by troops from British Fiji, captured and deported Steinberger, defeating the king and installing British rule. Steinberger was deported in February 1876 on the HMS *Barracouta*.

A collection of ten pieces came from US Navy Lieutenant William E. Safford, who entered the US Naval Academy at 17 and studied marine biology. After graduating in 1880 he spent the next three years in the tropics on the ship *Powhatan*. In 1883 he attended Yale to study botany, and in 1885 he went to Harvard to study marine zoology. After this, he spent several years in the South Pacific doing botanical and ethnological research; his collection from this time includes barkcloth, which he gave to the Smithsonian in 1889. In

Figure 18.4. Barkcloth, probably from Niue. Collected in Pago Pago, Samoa, about 1890 by Commodore Benjamin Warner Wells, Jr. (Department of Anthropology, Smithsonian Institution, E434501).

Figure 18.5. Storage area with drawers of Samoan barkcloth from the US Exploring Expedition (Department of Anthropology, Smithsonian Institution).

1891, he travelled to South America, off duty, serving as commissioner to Peru and Bolivia for the World's Columbian Exposition at Chicago. Most of his attention at that time was spent on ethnology. In 1883, he returned to the Navy and served in the Spanish-American war. He spent a year as the governor of Guam, which led to his authorship of *Useful Plants of the Island of Guam* and *The Chamorro Language of the Island of Guam* (both published in 1905). In 1902 he left the Navy to become an assistant botanist in the Office of Economic and Systematic Botany of the Bureau of Plant Industry, US Department of Agriculture, and published his work *Cactaceae of Northeastern and Central Mexico* in 1909. The George Washington University awarded him a PhD degree in 1920. 'He died January 10, 1926, a highly respected botanist, ethnologist, and linguist.'[2]

In 1890-1891, Henry Adams collected at least six pieces of barkcloth. Henry Adams, a famous historian and member of a US political dynasty, travelled to Samoa, Fiji, and Tahiti with American artist John La Farge. Both were entranced by Samoa and the Samoans. While La Farge painted, Adams took photographs and made a collection. Adams and La Farge were adopted by the so-called Queen of Tahiti, Ariitaimai, the female chief of the Teva family. Adams assisted the Teva family in writing its history, a genealogical discourse interwoven with legends and songs. The objects Adams collected – including six pieces of Samoan siapo (Kaeppler, 2017a) – came to the Smithsonian as part of the Phillips Collection. William Hallett Phillips, a Washington, DC, lawyer, friend, financial advisor, and co-adventurer of Henry Adams, was drowned in a sailing accident in May 1897. His collection was deposited in the Smithsonian by his mother and brother, Mrs Eugenia Phillips and P.L. Phillips.

94 barkcloths from Rear Admiral Lewis A. Kimberly came in 1890. Kimberly joined the Navy in 1846 and spent much of his early career in Africa and the Pacific. In 1885 he became Commandant of the Boston Navy Yard. The barkcloth pieces are part of the gifts presented to him probably in 1889 as gifts to the government from Malietoa, Mataafa, and other high chiefs of Samoa. They were given in thanks for the US's involvement in local affairs after the devastating hurricane of 15 March 1889. A later but significant collection of 39 pieces was given by Mrs Dewitt C. Ramsey. They were given to the museum in 1962 after the death of her husband, who had acquired them during a tour of duty in the Pacific with the US Navy.

Society Islands

There are five pieces from the Society Islands. Two are beautiful old leaf-stamped sheets, one from the US Exploring Expedition and one from Captain John Aulick, possibly from 1837 (Kaeppler, 2017b) (for Aulick, see above under Marquesas). Three pieces are from dance costumes given in 1989 by Carol Weigold.

Tonga

There are at least 34 pieces of Tongan barkcloth (*ngatu*) in the Smithsonian collection. Unfortunately, during the visit of the US Exploring Expedition a civil war was in progress, and few objects of any sort were collected. Only one piece of barkcloth is attributed to Tonga, but there are probably many more, especially in the collections attributed to Fiji and Samoa (Kaeppler, 2019). There are four pieces from Townsend and Moore from 1899-1900 (see under Cook Islands), but most of the Tongan pieces were given one or a

2 https://www.pwrc.usgs.gov/resshow/perry/bios/SaffordWilliam.htm.

few at a time by various people who visited Tonga in the second half of the 20th century. Several have series of *kupesi* design board motifs with well known symbolism, such as *Koe Hala Paini o Vaha Kolo* (the road of pines at the centre of the village) or *Koe Sisi Heilala* or *Koe Sisi Maile* (ornamental girdles of *heilala* flowers or *maile* leaves).

Tuvalu

Three pieces come from Tuvalu, two localised to Nui atoll, by their collectors in 1900, Townsend and Moore. The other piece was given in 1943 by Mrs Joseph Stanley Brown.

Wallis and Futuna

Among the 22 pieces attributed to Wallis and Futuna, only one is from the US Exploring Expedition. Six are from Townsend and Moore in 1900 (see under Cook Islands). Three pieces come from Isaac M. Brower, US Consul to Fiji, in 1876, and one from Colonel Albert B. Steinberger (see under Samoa). In 1891 a piece came from US Navy Lieutenant Timothy D Bolles, and one in 1896 from E. O. Schuyler. One piece from 1939 is from Dr Hugh M. Smith, one from 1969 from David D. Thomas, and one from Richard Powell in 1991. In 2018, the museum received the gift of a rare old *salutasi* (apron) from Futuna from Penelope Brook (Figure 18.6).

New Guinea and Melanesia

There are 41 barkcloth pieces and objects attributed to New Guinea, including a few early pieces traded from the Royal Zoological Museum, Florence, in 1891, three pieces from 1929 from the US Department of Agriculture, and three pieces from 1959 from Lieutenant Colonel James B. McNally. From New Britain, 14 barkcloth masks are from the Baining; six of these were collected by George Corbin (Figure 18.7). Corbin received his PhD in primitive and pre-Columbian art from Columbia University in 1976 on *The Art of the Baining of New Britain*. From 1969, he was a faculty member in the Department of Art at the Herbert H. Lehman College, City University of New York. Two of the masks were included in the exhibition and catalogue of the *Art of the Pacific Islands* at the National Gallery of Art in 1979 (Gathercole, Kaeppler, and Newton, 1979; Corbin, 1982; Kaeppler, 2017c). The other eight Baining masks were collected and given by George C. McGhee, a Rhodes Scholar and oil prospector who became a central figure in postwar diplomacy by helping create and shape US economic, military, and petroleum ties from Europe to the Far East. His last significant diplomatic posting was to West Germany, from 1963 to 1968. He travelled to New Guinea primarily as a tourist and gave his large collection to the Smithsonian in 1994.

Solomon Islands

There are two pieces from Santa Cruz. Anuta, a Polynesian outlier in the Solomon Islands, has two collections: three strips of thick barkcloth, made in 1978 by the family of Pu Notau from the inner bark of the antiaris tree were collected and given by Dr Douglas Yen, botanist at Bishop Museum; and 14 pieces of *Antiaris toxicaria,* men's loincloths and turmeric-stained panels worn by women, were given by anthropologist Richard Feinberg in 2013.

Figure 18.6. Salutasi from Futuna, given by Penelope Brook in 2018 (Department of Anthropology, Smithsonian Institution, E435345).

Figure 18.7. Baining dance mask covered with barkcloth from Rondoulit village, New Britain. Collected by George Corbin in 1972 (Department of Anthropology, Smithsonian Institution, E433033).

Micronesia

Micronesia is not a barkcloth-making area, but the collection includes five pieces attributed there. These may have been imported from elsewhere or made of 'non-barkcloth' fibres, such as *Hibiscus*.

Summary and conclusions

The Smithsonian collection includes barkcloth pieces and objects in several Smithsonian museums and from many barkcloth-producing areas of the world, including Africa, Central and South America and Asia, except for East Asia (for example, pieces from China, Japan, Korea are totally absent). The largest collections are from the United States Exploring Expedition (1838-1842), primarily Polynesian; and William Abbot (1901-1926), primarily from Indonesia and Southeast Asia. Others can be traced to individuals who travelled in the Pacific for the US Navy or on expeditions, such as the US Fish Commission, as well as travellers and tourists who collected a few pieces for museums and as souvenirs. A number of pieces from the late 20th and early 21st century were collected by Smithsonian staff members in the Anthropology Department and other departments, especially the Botany Department. This large number of pieces from the Pacific are important for the attribution of pieces of unknown origin or provenance, but few pieces or groups of pieces in the Smithsonian (or any collection) have been studied in depth.

The 1100-piece Smithsonian collection is highly significant in terms of its broad coverage and large number of barkcloth pieces, with particularly important collections from Fiji and Samoa. It is comparable to the British Museum collection, which also has about 1100 pieces, some from the 18th century, including from the voyages of Captain Cook. To put the collection in a wider context, there are other significant collections in the UK, including the Pitt Rivers Museum (about 803); Museum of Archaeology and Anthropology, University of Cambridge (940); and the National Museum Edinburgh (517). In Quai Branly, Paris, there are about 446 pieces. In Germany, Berlin, Dresden and Leipzig have numerous pieces, but they have not been able to give me an approximate count. The Peabody Museum of Archaeology and Ethnology at Harvard University in the USA also has a good collection of around 791 objects. The Auckland War Memorial Museum has 912 pieces, and in the Bishop Museum, Honolulu, in the Pacific itself, there are over 3600.

19

'Holomua ka Hana Kapa': A Symposium on Caring for Kapa and Kapa Makers at the Bernice Pauahi Bishop Museum, December 2017

Alice Christophe

A holistic approach to barkcloth making, research and care

With over 3600 barkcloths and barkcloth samples from across Oceania in the Ethnology Collections, including over 2000 Hawaiian *kapa* (Hawaiian barkcloth), the Bernice Pauahi Bishop Museum (BPBM) in Honolulu cares for one of the largest collections of barkcloths in the world. This extraordinary collection reflects the diversity of barkcloth and barkcloth making techniques through time and space, speaks to the creativity and skills of the many hands involved in their creation, and reveals the breadth and depth of the museum's continuing legacy of collecting, researching and caring for kapa and tapa from the 19th century to the present. Although a significant reminder of the BPBM's tremendous responsibility to actively preserve these cultural treasures and support the perpetuation of barkcloth making, this collection remains a finite portion of the extraordinary stories, pathways and relationships beaten and inscribed into kapa and tapa. As one begins to unfold the cloths, the tangled layers felted and stitched through their creation and their history resurface, showing the importance of deploying a holistic and connective approach to researching and caring for such collections.

At the BPBM kapa and tapa exist in a tight ecosystem, involving collections, spaces, natural resources and people, bound and intertwined through chains of ever-transforming practices and relationships. When not on display in the permanent galleries or presented in temporary exhibitions, the museum's collection of tapa and kapa serves as a resource for a large community of practitioners, artists, researchers and students. Behind the scenes, large barkcloths are stored on acid-free rolls, or folded in metal drawers lined with archival paper, from which they can easily be removed for public viewing. Smaller pieces, samples and fragments – some historically traded with museums around the globe – are kept in Mylar® sleeves, bound in historical books, or placed in archival boxes. The conservation department has historically researched and practised a variety of

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treatment methods for kapa and tapa, and the list of works requiring attention never stops growing. The tools, the chants, the dyes and the plants used to make barkcloth are cared for across three buildings and five departments of the museum, pertaining to both cultural and natural history. Living *wauke* (paper mulberry) and other plants used in this practice grow on the museum's grounds, where practitioners gather every Wednesday to make kapa and kapa tools. Photographs and literature documenting barkcloth making and collections have long been focal points of the Library and Archives Department, and of the Bishop Museum Press. This led to significant contributions by William T. Brigham (1911), Te Rangi Hiroa/Sir Peter Buck (1957), Dr Kenneth Emory, Dr Adrienne Kaeppler, Dr Roger Rose, Catherine Summers (1999) and others, which continue to serve as key resources for generations of scholars and makers. A brief exploration of the museum's collections pertaining to tapa and kapa exposes the necessity of reconnecting all parts of the ecosystem described above, and reassembling the many layers fragmented through museum taxonomy, yet felted together through practice. It also hints at the complex possibilities of meaningfully reshaping our paradigms of barkcloth care and research, and doing so in a way that supports multiple ways of learning, teaching and making. The two-day symposium *Holomua ka Hana Kapa: Caring for Kapa in the 21st Century*, organised by the BPBM's Ethnology staff and hosted at the museum on December 9-10, 2017, provided a fertile ground for these conversations. Initiated by Dr Andy Mills, Professor Mark Nesbitt and the project *Situating Pacific Barkcloth in Time and Place,* it offered possible avenues for establishing a holistic, grounded and inclusive framework with regards to kapa care and research, a framework which later led to a workshop series aiming to initiate the development of a renewed model for engagement and stewardship at the BPBM.

'Caring for kapa is caring for the kapa makers'

In mid-2017, the BPBM was approached by the *Situating Pacific Barkcloth in Time and Place* project research team regarding the possibility of developing a two-day workshop focusing on Pacific barkcloth.[1] The Ethnology staff began the process of shaping this programme by gathering the key actors of its curation. Marques Hanalei Marzan (Cultural Advisor), Michelle Kamalu du Preez (Assistant Collections Manager and kapa practitioner) and I met to discuss the scope and the goals of this endeavour. Dr Mara Mulrooney (then Director of Cultural Resources) and Sarah Tamashiro (then Ethnology Collections Technician) together with the BPBM's Events and Exhibits departments provided guidance and support regarding logistical development of the event.

This programme, designed for practitioners, museum professionals, researchers and students based in Hawai'i, the USA and Europe, was envisaged as a unique opportunity to encourage cross-disciplinary research on barkcloth and to provide access to the collections behind the scenes. With this vision as a foundation, the curatorial team began to review the collections of kapa, tapa, *masi, ngatu, siapo, hiapo, mahute*[2] and other barkcloth-associated collections in the care of the museum, as well as to develop topics of primary interest to pursue during the symposium. Perusing pictures and records, the group was reminded of the complex nature of barkcloth stewardship and research, which leads to engaging with large and diverse collections, presenting various levels of physical stability and including

1 At that time I was the Collections Manager for Ethnology at the museum.
2 The Hawaiian, Pacific region, Fijian, Tongan, Samoan, Niuean and Rapanui names for barkcloth.

cultural treasures so large that physical access becomes a constant challenge. With kapa and tapa, perhaps more than with any other treasures under our care, exploration and research are inextricably linked to a progressive and highly curated process, to slow movements through collections spaces and long examination periods, which a two-day event would not be able to accommodate and showcase. Despite our desire to 'bring it all out', to honour our partners and to host the future participants in the most generous manner, we committed to selecting key works that would inspire and support our guests' reflections during the programme. This commitment led to considering who our target audience truly was and, most importantly, to reflect on the very reasons why and for whom we care for these collections.

As the steering group continued to build a selection for the workshop, we reached three key conclusions that shaped the programme, its purpose, and its ultimate audience. Firstly, the two-day event would become a means to address the challenges encountered while caring for barkcloth and to reflect on the stewardship of these collections. Through this programme, the team intended to dwell on BPBM's former endeavours in order to initiate a transformation of the very meaning of 'engagement' with the community, by reframing it through the lenses of care and perpetuation in relation to practice. Secondly, the symposium would rely on resources from both the museum's cultural and natural collections – and highlight multiple ways of knowing, sharing and caring – by bringing together the many hands involved in the making and preservation of barkcloth and associated knowhow. Finally, this event, hosted and curated from Hawai'i would honour this place as a *piko* (navel), as well as the genealogies of kapa makers and artists – without whom none of this would have come to be. In this context, stewarding and caring for tapa and kapa collections from this place means, first and foremost, *caring for the kapa makers.*

As Kamalu du Preez, a core member of our team, mourned her *kumu kapa* (kapa teacher) Moana Eisele who had passed earlier that year, we decided to dedicate the symposium to the memory of this inspiring artist. Moana Kaliko-o-kalani McPherson Eisele, was born and raised in Kālia, Waikīkī. In 1978, Dennis Kana'e Keawe mentored her and other members of her Hawaiian civic club in the art of kapa making. Beginning in the 1980s, Moana took part in numerous exhibitions, demonstrations, lectures and international gatherings as a kapa practitioner across the Hawaiian Islands, in Asia, and many places within the Pacific region. As an outspoken proponent of Hawaiian cultural practices and values, 'Auntie Moana' passed these on to members of her immediate 'ohana (family), as well as the larger community in Hawai'i and around the world. Her absence was keenly felt but her legacy, and that of many makers before her, grounded the vision for this gathering.[3]

While the core vision was strongly established, we continued discussing the cultural and geographical scope of the content till late in the process. The steering group explored two possible avenues for the programme, with one version exclusively focused on Hawaiian kapa makers and collections, and the other structured around the theme of barkcloth as a connective medium and involving both kapa and tapa makers by engaging with the Hawai'i-based Pacific diaspora. While we faced limitations of time, space, and resources to support the latter, we also relied on a strong network

3 The biography of Moana Kaliko-o-kalani McPherson Eisele was provided by M. Kamalu du Preez in December 2017.

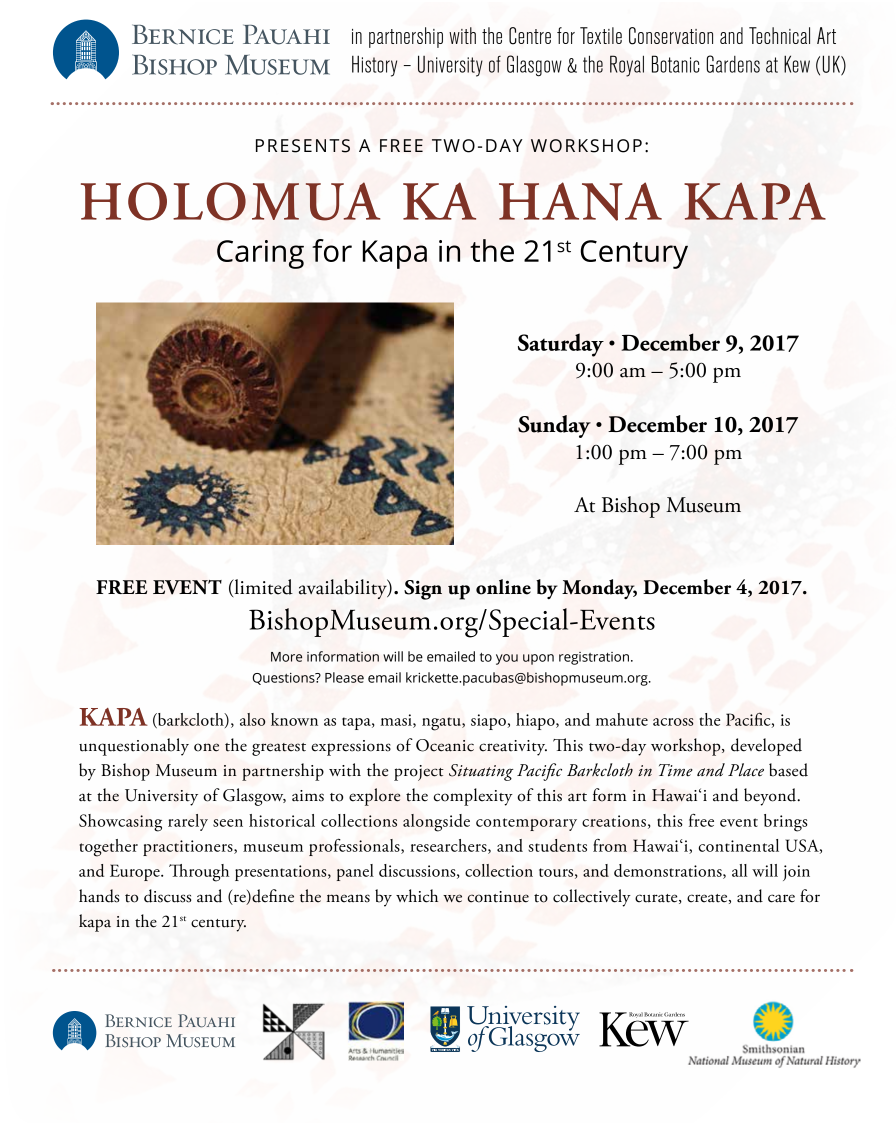

Figure 19.1. Flyer of the workshop *Holomua ka Hana Kapa*, which includes a photograph of a piece by Moana Eisele.

of scholars and artists within Hawaiʻi. As the team identified the need for a gathering supporting kapa makers of Hawaiʻi, we defined this place as the focus and the piko of this event, while committing ourselves to honouring Pacific tapa makers through the museum's collections. Interventions by local speakers were re-centred on Hawaiian kapa and kapa making practices, while presentations by members of the *Situating Pacific Barkcloth* project paired with a behind the scenes tour highlighting collections from across Oceania became the window onto Pacific practices outside of Hawaiʻi (Figure 19.1).

Holomua ka Hana Kapa: Caring for Kapa in the 21st Century

With the English title of the symposium suggested by the University of Glasgow team, the BPBM team focused on crafting its Hawaiian portion. Emphasising the vision highlighted above, the title *Holomua ka Hana Kapa* was first a tribute to *Ka Hana Kapa: The making of bark-cloth in Hawaii*, a volume on tapa, kapa, kapa making and implements by Bishop Museum's first director and curator, W. T. Brigham, published by Bishop Museum Press in 1911 and used as a resource by the caretakers and makers. The term *holomua* suggested progress and a movement forward, both acknowledged sources of knowledge, including this volume of a century ago, while expressing a desire to continue to enhance the understanding of the art of kapa making, and to address the future of this practice and the museum's role in supporting its perpetuation.

The detailed programme itself was developed by the museum's team in consultation with Oʻahu-based kapa makers. Kamalu du Preez took the lead in contacting practitioners and local presenters, and worked with the rest of the team to adjust and adapt the programme to their vision and key interests. Combined with the propositions made by the members of the project *Situating Pacific Barkcloth in Time and Place*, the narrative and sequences of this two-day event began to take shape. The first day was reserved for presentations by scholars, practitioners, researchers and curators sharing their journey into barkcloth research and making, while the second day was envisaged as a window into the care and stewardship of kapa and tapa behind the scenes of the BPBM. Hands-on demonstrations were intentionally excluded from the programme, freeing additional time for makers to express their views and reflect on their practice and experimentations in a holistic manner.

When the event's page was launched through the museum's online platform, most of the 60 seats available were booked for both days in less than 48 hours. The themes explored on each day aimed to honour the core intent of the programme to care for the kapa makers, and to serve the continued transformation of kapa research and stewardship moving forward. Day One focused on the themes of genealogies and collections, and on technique and experimentations understood through practice. The first session – *Kapa Collections, Histories and Genealogies* – showcased interventions by Andy Mills, Mark Nesbitt, Adrienne Kaeppler, Antje Denner, Maile Andrade, and Marlene Zeug; bringing international and local scholars and kapa practitioners together on one stage, this session demonstrated the importance of acknowledging and piecing together multiple sources of knowledge – be it a kumu (teacher), a collection or a natural resource. This gathering of presenters led to key questions regarding access to collections, genealogies of care, the circulation of kapa and tapa, and knowledge production (Figure 19.2). Altogether, it further emphasised the existence of a tight equilibrium between sources and resources, and the necessity of working together to deconstruct and reconstruct research paradigms concerning kapa and tapa.

The second session on Day One – *Kapa in Practice* – was a unique opportunity to follow in the footsteps of six kapa makers and artists. Kaʻiulani DeSilva, Sabra Kauka, Aʻiaʻi Bello, Lisa Schattenburg-Raymond, Bernice Akamine and Dalani Tanahy offered their *ʻike* (knowledge) and *manaʻo* (thoughts) to the audience by sharing their journey into kapa making and experimental research with plants and dyes, and by recounting their sources of inspiration. Their testimony demonstrated not only their commitment to this art form and to the values that carried them through their personal journey into it, but also shed

Figure 19.2. Presentations taking place on Day One of the workshop included discussions on kapa collections, histories and genealogies, as well as reflections on making methods and experimentations with plants and dyes.

light on their deep connection to the *'aina* (land) and to the natural resources used to produce kapa. Revealing the complexity of the experiments leading to creating the finest cloths, their interventions immediately stimulated conversations between the makers and the members of the project *Situating Pacific Barkcloth in Time and Place* around the use of specific plants such as *māmaki* (*Pipturus albidus*).

Day Two focused on kapa care and stewardship and was divided into two alternating sessions, one dedicated to kapa conservation and physical care, and the other to collections tours behind the scenes (Figure 19.3). The former – *Bridging Indigenous Preservation and Museum Conservation* – aimed to highlight museum best practices in physically preserving barkcloth, and stimulated conversations on other means to steward kapa from the perspective of the makers. This session revealed that while practitioners highly value physical preservation of historical cloths, they equally viewed the perpetuation of practice, and the ability to continue making new works for ever-transforming and living purposes as essential. The second session of Day Two focused on the stewardship of kapa and tapa collections in the museum's storage facilities. Collections tours sought to emphasise the accessibility of the collections by everyone and anyone wanting to engage with these cultural treasures, and to determine the best means to serve the kapa making community in accomplishing their work. The selection presented during the tours combined tapa from across the Pacific with a large number of kapa and kapa samples and tools speaking to the breadth and depth of the practice and the diversity of techniques, patterns, stories, and types of cloths in the care of the museum. As all participants engaged in exploring

Figure 19.3. Workshop participants examining a collection of kapa and tapa samples donated to Bishop Museum by the National Museum of Scotland (former Royal Scottish Museum) during a collections tour on Day Two.

these resources, the reflections steered towards means to construct shared stewardship and integrated caring methodologies that would best serve the makers as well as the broader community. As we collectively discussed the digitisation of barkcloth collections for instance, we established that documenting the thickness and beater marking of kapa in addition to generating broad and detailed views of the cloths would increase the usability of digital resources by the makers. We also discussed setting up recurring collective work sessions in collections, allowing the participants to continue engaging with physical collections and their associated stories, while building knowledge and improving kapa care together. Finally, conversations between the makers and ethnobotanists further confirmed the need for an integrated database system bridging cultural and natural collections in order to continue to explore relationships between cultural and natural resources management, preservation and perpetuation.

The gift of the kapa makers: towards an integrated stewardship model

The workshop *Holomua ka Hana Kapa* demonstrated how an increased level of community engagement through public programmes focused on collections development, interpretation, and preservation led to collective awareness and strengthened a sense of care and belonging. The response to this two-day event was overwhelming, and very positive feedback was received from the participants during and after the symposium. Some described their attendance at the workshop as ‘a privilege’, others as ‘a true gift’, while yet others recognised the museum's 'hard work to preserve and share [our] gems'. Several participants from Hawaiʻi and overseas also felt 'inspired' and 'stimulated' by this gathering. As our teams continued to reflect on this happening and the positive feedback received throughout the event, we were struck by the powerful gift offered by the community of kapa makers and caretakers and the many pathways that could be explored in relation to other practices and collections. Building on this foundation, I developed a grant proposal for public programmes to Hawai'i's Council for the Humanities, with the support of Mara Mulrooney. Hosted by the Ethnology Department at the BPBM, the *Laulima* Workshop Series was envisaged as a series of programmes placing Hawaiian artistic practices and contemporary creation at the core of community stewardship and engagement within Bishop Museum's space and collections. Based on experiences drawn from the workshop *Holomua ka Hana Kapa*, the Laulima (meaning 'many hands') series provided a unique platform for community representatives, museum professionals, researchers, students, and practitioners to collectively explore and nurture contemporary practices. In 2018 the Laulima series focused on two of Hawaiʻi's most vibrant cultural practices and art forms: *ulana* (weaving) and *kālai* (carving). During each workshop, the Bishop Museum served as a gathering space for all participants, but also opened the doors of collections and invited the local artistic community behind the scenes. By bringing together the many hands that take part in preserving and perpetuating these practices, the Laulima workshops allowed the community to activate and shape the making of knowledge with reference to weaving and carving collections. Connecting technology with academic and indigenous sciences, and cultural revitalisation with the management of natural resources, this programme allowed the participants to collectively deepen their understanding of Bishop Museum's collections; this, in turn, became an opportunity for the museum to learn and continue to transform its interpretations of collections. Grounded in the lessons learned from the kapa making community, Laulima was a stepping-stone in the development of a renewed vision, placing communities and collections at the core of the museum's mission and undertakings. With the support of the Hawaiʻi Council for the Humanities, the Laulima workshops have also engaged with the communities of practitioners and caretakers outside of Oʻahu, and reached beyond the current museum's networks to widen and strengthen these communities.

Acknowledgements

I extend my warmest thanks to the many hands and minds involved in the endeavours recounted in this essay. In particular, I wish to express my sincere gratitude to the kapa makers of Hawaiʻi who inspired and helped shape the approach to care and curation explored here. I will continue to cherish your gift for years to come.

20

Fiji Masi and the Auckland Museum Pacific Collection Access Project

Fuli Pereira, Leone Samu Tui

During the 1980s anthropological museums came under heavy criticism regarding the research, presentation and display of cultural artefacts that had been acquired in the field. This critique came from within the discipline itself (see Clifford, 1985; Clifford and Marcus, 1986) as well as, of course, from indigenous source communities themselves. Over more recent decades numerous negotiations of partnership, consultation and engagement have been employed (Herle, 1994; Kahn, 2000; Hatzipanagos, 2018) by museums, and increasingly art galleries, in attempts to live up to their social and moral obligations of inclusivity, de-centred Eurocentricity and increased diversity. What follows is a brief introduction to the Auckland War Memorial Museum's exploration of an engagement process primarily based on staff experiences and knowledge as museum people of Pacific Island heritage.

Auckland War Memorial Museum's (AWMM) Pacific collection is broad, both geographically and in type. The collections cover the Pacific Islands from the Northern Mariana Islands and West Papua in the west, northeast to Hawai'i and southeast to Rapa Nui Easter Island, and westward again to Aotearoa New Zealand and the Pacific communities that make their homes there. AWMM holds over 1,000 items of barkcloth, and an extensive collection of accoutrements of barkcloth making and decorating. Portions of these collections have been published. A survey of the museum's barkcloth collection was undertaken in the late 1980s and culminated in the 1997 publication *Pacific Tapa* by Roger Neich and Mick Pendergrast (1997a) which showcased the range and scope of the AWMM barkcloth collection. Continued research into barkcloth in the collection led to surveying material which incorporated barkcloth, *e.g.* North Coast New Guinea breast ornaments, Western Highlands wigs and Admiralty Islands aprons; this survey led to the 2004 publication *Pacific Jewellery and Adornment* by Roger Neich and Fuli Pereira, which in turn showcased the AWMM's extensive adornment collection.

In 2012 AWMM launched its *Future Museum Plan*, a 20-year strategic and capital investment plan to guide the museum's pathway of transformation, refreshment and

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renewal.[1] Central to the *Future Museum Plan* is increasing access and engagement with the museum's encyclopaedic collections for all visitors, Auckland-based, national and international, and not just in the traditional ways of museums – exhibitions, publications and public events – but including full online digital access to the collections database.[2] In preparation for this improved access investments were made to raise the quality of storage and location control, to enable conservation treatments, improve data records and standards, and to create high quality digital images. To accomplish this Collections Readiness Projects were established, the flagship of which was the *Pacific Collections Access Project* (PCAP).

Established in 2016, PCAP's parameters were: that the project would only have a three-year duration; a maximum of 5,000 items from a Pacific collection of approximately 28,000 would be selected for work; the identification of collections was deemed out of scope for the project; and as the project would trial community consultation it was decided that the collection to be processed should reflect the major Pacific populations of Tamaki Makaurau, Auckland, which is overwhelmingly Polynesian. With a selection potential therefore of only Polynesian material, which had not been previously worked on, nor was on permanent display, these parameters incredibly garnered us 5,082 Polynesian objects (see Table 20.1).[3] Given the time-frame and number of collection items it was estimated that a team of seven staff would be the minimum required.[4] The basis for PCAP was the Pacific framework document of AWMM, *Teu Le Va*: Nurture the Relationship (Auckland War Memorial Museum, 2013). The maxim 'teu le va' encapsulates principles staff knew offered a unique and more balanced way forward for a Western focused, gendered and largely monocultural institution, to stretch its thinking and become more inclusive of descendant communities. 'Teu', verb, to cultivate, to nurture; 'le', the; 'va', noun, relationship, space between; 'teu le va, nurture the relationship' is a common expression, entreaty or lesson in Western Polynesia because, as Samoan author and poet Albert Wendt has stated, 'our va with others defines us'. The saying compels entities to act appropriately in all circumstances. It speaks to acknowledging and behaving in the proper, principled manner encompassed within principles of reciprocity, balance, symmetry, respect and mutual trust within the covenant that is a relationship. 'Va is the space between, the betweenness, not empty space, not space that separates, but space that relates, that holds separate entities and things together in the Unity-that-is-All, the space that is context, giving meaning to all things.' (Wendt, 1999).

The team sought ways to use PCAP to cultivate the space between the object, its record and the Pacific community; essentially to nurture the relationship between the museum and the Pacific community. This was manifest in the creation of rich cultural content through the processes of shared authority, the privileging of Pacific knowledges and languages, and valuing knowledge still held within the communities. We worked with knowledgeable

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1 Renew on-site gallery exhibition spaces; refresh off-site outreach and public programmes; transform on-line access to digital content and museum databases.

2 AWMM Collections Online database's default setting is 'Open', rather than the usual 'Closed' apart from specific collections.

3 A four-year project of re-cataloguing and photographing our largest pieces of tapa which was started in the late 1980s was finally completed in 2004. Items on permanent display were also discounted from the PCAP project; this included approximately 1800 items on exhibition in the public galleries.

4 Project Manager (0.5), Head Collection Technician (1), Collection Technician (2), Project Conservator (1), Community Engagement Facilitator (1), Storage Technician (1) and Head Storage Technician (0.5).

Figure 20.1. Knowledge holder session with members of the Cook Islands community working with PCAP staff on the Cook Islands AWMM tivaevae (quilts) collection. Left-right: Mr William Hakaoro (knowledge holder), Mrs Mary Ama (knowledge holder), Leone Samu Tui (Collection Technician), Ms Sabine Weik (Project Conservator), Ms Jami Williams (Manager PCAP), Mr Marcus Capes (Senior Storage Technician), Ms Valerie Noiret-Leblanc (Storage Technician), Mrs Kimi Hakaoro (knowledge holder, seated), Ms Anita Jacobsen (Collection Technician).

elders from within the Pacific communities and honoured what was shared as knowledge passed down from the ancestors. An aspiration was that this knowledge should be discoverable by the indigenous communities; to date over 2,000 indigenous terms have been garnered from the 13 island groups involved with the PCAP project, 62 knowledge holder sessions were held, approximately 7,000 visitors were hosted by the PCAP team and 6,000 treasures have been catalogued, conserved, re-housed and photographed (Figure 20.1). The collection was processed alphabetically through 13 island nations from the Cook Islands, Fiji (including Rotuma), French Polynesia, Hawai'i, Kiribati, Niue, Pitcairn, Rapa Nui, Samoa, Tonga, Tokelau, Tuvalu, Wallis and Futuna (see Table 20.1). A small but significant number of collection items were found not to have been linked to a Place in the database. To resolve this gave the museum opportunities to second interested personnel from across the institution to assist with this early data enrichment. Most of these 'volunteers' were front-of-house museum staff and all of Pacific heritage, further allowing us to give descendant community staff members other opportunities to assist in the care of, and access to, their *taoga* (treasures). This meant that almost 1,000 objects were added to the workload, but only a three months extension and no other extra resources.

The PCAP's Community Engagement Facilitator, a first ever for the museum, worked closely with a community lead (someone of the community and with connections within

Country	Collection Number from Database as of 11.12.2015	Collection Number Worked on after 'Place' Added 02.08.2019	Name Gifted by the Community	Approximate Translation
Cook Islands	690	946	*Akairo a te Taunga*	The Signature of the Creator
Fiji	1325	1328	*Nai Yau Vakaviti – Na Ka Mareqeti*	Fiji Treasures – They are Treasured
French Polynesia	333	376	*Tupuna Ma'ohi ka Ora*	Ma'ohi Ancestors, You will Live on
Hawai'i	71	215	No indigenous name provided	
Kiribati	1199	1147	*Rikian Tungaru*	Kiribati Culture
Niue	279	304	*Lavahi Mau e tau Taoga Tokiofa ma e Atuhau*	Treasure and Honour our Sacred Taoga
Pitcairn Islands	13	13	No indigenous name provided	
Rapa Nui	36	24	No indigenous name provided	
Samoa	413	528	*E Taua au Measina, Lau Gagana ma Lau Aganuu*	Treasure your Taoga, Your Language and Your Culture
Tokelau	203	251	*Poupouaki a Tatou Koa*	Hold Fast Our Treasure
Tonga	421	531	*Ngaahi Koloa Tukufakaholo 'a e Pule'anga Faka-Tu'i ko Tonga*	Traditional Treasures of the Kingdom of Tonga
Tuvalu	97	114	*Fakaakoigina te olaga o tou tuaa mo fakatautai toe olaga fano ki mua*	Embracing the Past to Navigate the Future
Wallis and Futuna	2	22	*Ma'u me'a faka Fanau – Uvea mo Futuna.*	Family Treasures from 'Uvea and Futuna
Totals	**5082**	**5799**		

Table 20.1. Pacific collections which formed the basis of the PCAP project, and the different language titles gifted to better reflect the project within the Pacific communities.

it), to identify acknowledged makers and holders of cultural knowledge within their community to share and exchange information, and help augment understandings of the manufacture, material and use of collection items in their original cultural context. One of the first tasks required of the community leads was to replace the unwieldy and externally meaningless project title 'Pacific Collection Access Project' with one of more meaning and resonance for the communities (see Table 20.1, Figure 20.2). The team worked with identified knowledge holders during organised sessions, and through a process of *talanoa* (the Fijian term for conversation, discussion) museum-held information was exchanged, experiences remembered, memories recounted, and histories recalled (Timote and Vaioleti, 2006). This talanoa brought out detailed indigenous knowledge previously absent from the museum collection archives, which was recorded by note-taking, audio and audio-visual recordings. The knowledge holders' expertise in naming of objects, identifying materials, discussing techniques of manufacture, and cultural use was invaluable in enriching our understanding of the collections we care for. During many sessions a community representative was asked to assist staff in composing a glossary of indigenous terms during the talanoa. Prioritising these sessions also afforded us the opportunity to seek community advice on cultural sensitivities to be considered when deliberating on access and storage methods. The consensus was that generally conservation protocols around storage and

Figure 20.2. HRH Princess Mele Siu`ilikutapu Kalaniuvalu Fotofili, Patron for the Tongan segment of the Pacific Collections Access Project, for which her Royal Highness gifted the name, *Ngaahi Koloa Tukufakaholo ʻa e Puleʻanga Faka-Tuʻi ko Tong*: Traditional Treasures of the Kingdom of Tonga.

handling mitigated many of the concerns held by descendant communities. Museum conservation best practice establishes that no food or drink is consumed or brought into the vicinity of collection items; material is not handled unnecessarily; items of high ceremonial significance are stored discreetly.[5] To allay community concerns regarding inappropriate copying and use of images, the museum makes available thumbnail size images, but higher resolution images must be requested directly, and each request is processed through the AWMM Cultural Permissions Process.[6]

Community leads helped the team to reach more of their community and led engagement initiatives on their community's behalf. Anthropologist Dr Tarisi Vunidilo and respected heritage artist Mrs Joana Monolagi were key advisors for the Fijian portion of the PCAP project, which was active between October 2016 and November 2017 (Figure 20.3). Tarisi is a champion of Fijian language and culture, and Joana an expert *masi* (barkcloth) maker. Through their advice and planning, several hundred Fijians visited the museum and participated in PCAP-related community events. With over 4,000 Fijians resident in Auckland, a question was how to deal with potentially high visitor numbers to Fiji community days. Vunidilo and Monolagi advised that an appropriate way to divide up the collections to be viewed by the Fiji community was through three Confederacy-based community open days and one Rotuma community day, thus ensuring that the PCAP team could showcase a wide range of Fijian material at any one event, staff made best use of our limited display space and could guarantee that what was being showcased was most relevant to the particular visiting group. Dr Vunidilo's and Mrs Monolagi's contribution

5 The museum had already begun the work of keeping human remains in a separate store.

6 http://www.aucklandmuseum.com/discover/library/image-orders.

Figure 20.3. Mrs Joana Monolagi, masi artist and knowledge holder for PCAP whose knowledge and expertise regarding Fiji material culture enabled PCAP to enrich AWMM data information. Mrs Monolagi spoke to the processing and patterning of Fiji masi and she generously recounted stories of experiences of masi making.

was crucial to the success of *Nai Yau Vakaviti, Na Ka Mareqeti* in terms of their personal knowledge, as well as their knowledge of and connections within the wider Auckland Fiji community. These sessions helped to enrich the cataloguing of over 1,300 Fijian treasures.

Two masi knowledge holder sessions were held in early 2017 to examine a selection of 74 masi that fell under the remit of PCAP. Vunidilo and Monolagi generously identified two other expert masi practitioners, Mrs Mere Radini and Mrs Gade Gaunavou, who could also speak to the heritage art form of masi. Talanoa over these two sessions remembered pre-contact inter-island trading relationships, named decorative patterns, re-designated incorrect Fiji masi types, and location attributions made by previous museum staff. They debated potential dates of manufacture, identified incomplete states in detail and corrected spelling. The experts told us of the different trees masi is made from, the processes of masi making, printing and smoking, and the uses of various types of masi. Further to what we were seeking, deeper layers of information came out of the talanoa process. Knowledge and information came wrapped in personal lived experience, collective memory in chant and song form. We learned about one island renowned for its wood, another for its clay which provided a red pigment colour, and yet another island renowned for the actual manufacture of the masi from the paper mulberry tree. We gained insight into the Fijian language itself, the etymology of words discussed in conversation. We were privy to the remembrances of grandmothers and what they used, old designs, recognition of early motifs. We learned about the Fiji Confederacies, greater concepts around *tabu* (*tapu*, sacredness), proper protocols regarding dressing, and the importance of Fijian values of rank and ceremony. The depth of information presents challenges in terms of how much we should attempt to 'capture' or convey. Cataloguing challenges include the fact that there are 60 fields for each record, and 49 of them are administrative. Added to this is that the database system currently does not have structured hierarchies for recognising indigenous terms for materials. An additional

Figure 20.4. Descendant groups that visited the collection through the PCAP project often asked to perform, brought food made in the ways of their home islands or offered small gifts of gratitude. Rotuma, though their numbers were small, were excited to express their gratitude by offering all these.

challenge is creating pieces of data text that summarise the big concepts and topics of masi object type that draws from knowledge shared in the sessions in an appropriate way.

The recordings and notes of sessions will be deposited into the museum archives. The Cultural Permissions Process, an approval process for the use of Māori and Pacific images, will extend to the audio recordings for access and use. This will ensure a layer of security so that post engagement, care and cultural safety measures are observed beyond completion of the active project. To maintain equal partnerships with communities and knowledge holders, they of course have an opportunity to connect on a closer level with masi collections and draw inspiration from up close contact with the masi. There must be recognition that this kind of expertise is on par with other expert consultants that the museum brings in for projects and remunerate accordingly. This is information that is hereditary, personal and part of them. Being adept at social media, Dr Vunidilo regularly shared updates about the sessions, allowing Fijians in the wider diaspora in the global audience to keep up with what was happening. Her efforts and their community-led initiatives have inspired further engagement elsewhere outside Auckland Museum. Auckland Museum maintains its relationship with the Fiji community and their agency regarding their collective knowledge. The question of ownership is contested ground that requires much more talanoa. We continue to evolve our practice and have these conversations because such a strong Pacific conceptual framework has not been undertaken within this type of Eurocentric institution before (though other studies and projects have been undertaken elsewhere in the world, in Aotearoa New Zealand and Papua New Guinea, for example). It has been complicated yet simple, heart breaking and yet fulfilling, and there have been moments when hope seemed lost, but yet more moments filled with such potential (Figure 20.4).

~ Plant Profile 16: Red-brown dye ~

Malay apple *Syzygium malaccense* (L.) Merr. & L.M. Perry (formerly *Eugenia malaccensis* L.) MYRTACEAE

Mark Nesbitt

Left: Fruit and leaves at Hana Highway, Maui, Hawai'i.
Right: Watercolour, Penang, associated with the visit of Sir William Hunter, Surgeon to the East India Company, 1802-3 (Kew, Library, Art and Archives).

The Malay apple tree is native to southeast Asia and is an ancient introduction to Polynesia. The tree is valued for its sweet fruit, which can be eaten raw. The tree is cultivated in wet, tropical areas and is best propagated from cuttings; it can grow to 20 metres in height. It is sometimes naturalised. The bark was a source of red dye in Samoa, Niue and Hawaiʻi (Chapter 5). The skin of the fruit was used for a light-red dye in Hawaiʻi (Chapter 6).

Vernacular names (selected): Tonga: *fekika kai*; Samoa: *nonu fiʻagiʻa*; Niue: *fekakai*; ʻUvea, Futuna: *kafika*; Cook Islands: *kaʻika*; Society Islands: *ʻahiʻa*; Hawaiʻi: *ʻōhiʻai*; Fiji: *kavika*.

~ Plant Profile 17: Brown dye ~

Red mangrove *Rhizophora mangle* L. RHIZOPHORACEAE

Mark Nesbitt

Left: Mangrove at Mokolea Point, Kauai, Hawai'i.
Right: Relio Lengsi 109, Pohnpei, c. 2010 (National Tropical Botanical Garden, PTBG1000005961).

Red mangrove is native to the coasts of central and south America, and west Africa. A combination of long-lived seedlings, which germinate on the plant, fall off and can then travel for up to a year at sea, and introduction by humans, make it the most widely distributed mangrove species. As with other mangrove species, aerial roots both stabilise the plant and enable it to breathe in its coastal habitat. Tree trunks grow up to eight metres tall and produce a dense and useful timber and firewood. The identification of *R. mangle* in Polynesia is problematic. In Hawai'i it was introduced in 1902 by the American Sugar Company, to stabilise mudflats, and has since become invasive; this and an introduction in the Society Islands very likely represent this American species. However the *R. mangle* recorded by Whistler (1991, 2000) as used in Tonga and Samoa is more likely to be the native and very similar *R. samoensis* (Hochr.) Salvoza, also native to New Caledonia, Wallis, and Fiji (Tomlinson, 1978). This mangrove evidently has a long history of use for a red-brown dye made from the tannin-rich sapwood (Chapters 5, 9, 10). Other *Rhizophora* species in Polynesia were also used for dye. Whistler (2000) notes that harvesting of mangrove for firewood is leading to its disappearance in Samoa.

Vernacular names (selected): Samoa, 'Uvea: *togo*; Tonga: *tongo*; Fiji: *dogo*, *dongo*.

21

Shown to Full Advantage: Conservation and Mounting of Barkcloth for Display in the 'Shifting Patterns: Pacific Barkcloth Clothing' Exhibition at the British Museum

Monique Pullan

Introduction

The exhibition *Shifting Patterns: Pacific Barkcloth Clothing*, curated by Natasha McKinney, ran from February to December 2015 at the British Museum (BM). It focused on barkcloth as clothing, including pieces worn as everyday items and ceremonial costumes linked to key life cycle events such as initiation and marriage. Spanning the whole Pacific region, the display was arranged geographically. The 77 cloths showed the wide range of form, style and design, reflecting the traditions and histories of each island group whilst finding common threads and influences, and highlighting the tools and techniques of manufacture and decoration. With pieces dating from the early naval expeditions of the late 1700s to newly commissioned works from contemporary barkcloth makers, one of the exhibition's key objectives was to connect the objects back to people – the makers and the wearers. It aimed to demonstrate the significance of the cloths and their designs to those who made and wore them, and show how the wearing of barkcloth embodied the cultural and social identity of the whole community.

This chapter describes the conservation of three barkcloths for the exhibition, and their mounting in the display using neodymium magnets. Many of the techniques employed in the conservation of barkcloth at the Museum are described elsewhere (Pullan, 2015). Conservation decisions when treating barkcloth for display may differ from those made when treating them for long-term stabilisation or research purposes. Given their sheer variety of form, the display of barkcloth poses many challenges. The cloths' size and fragility often throw up practical issues in terms of space and mounting. The barkcloth must be able to withstand the additional rigours of display, needing to be manipulated when mounting or to support themselves when hanging. When presenting a community's material culture to a worldwide audience, additional treatments, such as cleaning and visual reintegration, may be carried out for aesthetic and cultural reasons.

in: F. Lennard & A. Mills (eds) 2020: *Material Approaches to Polynesian Barkcloth. Cloth, Collections, Communities*, Sidestone Press (Leiden), pp. 279-289.

Conservation of a Futunan salatasi (waist garment)

This *salatasi* (Registration number Oc1856,0709.14) was presented to the BM by Sir John Liddell for the Admiralty in 1856 and was said to have been collected by officers of the HMS *Herald* during surveys of the Pacific in the early 1850s. It is a fine example of the highly detailed, hand-painted, linear patterning typical of Futunan cloths. Rectangular in shape, the central field of glossy dark brown is surrounded on three sides by wide geometric borders of ruled fine lines in black and red. There is a zigzag edged fringe along the bottom. The cloth, although stiffened, was in excellent condition – apart from the fact that it had been cut into three more or less equal pieces (Figure 21.1a). Several of the larger cloths selected for the exhibition had sizeable sections cut out of them in the late 19th century. These 'samples', pasted to cardboard and housed in solander boxes, formed an extensive reference collection assembled by James Edge Partington, with the aim of facilitating study and comparison of the barkcloth in the British Museum. The decision was taken to re-integrate sections that had been cut from the cloths selected for display. Whilst the significance of this historic reference collection itself is not without merit, it was felt that displaying an obviously incomplete cloth, made incomplete by the Museum, was no longer an option. The exhibition provided an opportunity to return these cloths to their original form, making them displayable for the first time in over a century and acknowledging them as significant objects in their own right rather than examples of technical skill and design. Two of the pieces had strong folds and tangled, soiled fringing. The third, partially glued to cardboard, had undergone previous treatment to clean and flatten the fringing. Humidification and surface cleaning using smoke sponge erasers did much to unify their appearance. Laponite (synthetic clay) gel poultices aided removal of the cardboard backing. Following humidification it was found that the three sections could be neatly joined to reform the complete garment, with only an area of loss (c250mm x 80mm) in the top right corner.

To ensure precise alignment of the geometric designs, the joins were first made from the front. Tabs of Japanese paper, adhered using 10% Klucel G (hydroxypropyl cellulose) in industrial denatured alcohol, temporarily held the sections in position (Figure 21.1b). This allowed the cloth to be turned and 50mm wide support strips (also of Japanese paper) were then applied to the back of the garment along the joins, forming the main mechanism for reconstruction (Figure 21.1c). Due to the glossy brown coating decorating the back of the cloth (unidentified but possibly bishopwood, *Bischofia javanica*, or candlenut, *Aleurites moluccana*), wheat starch paste was combined with the acrylic adhesive Lascaux 498 (2 parts to 1) in order to improve adhesion. The temporary tabs on the front were easily removed using swabs slightly moistened with acetone, but were replaced with narrow (3-4mm) paper strips applied all along the cuts to reinforce the join from the front (Figure 21.1d). This was found to be necessary because the stiffness and weight of the barkcloth meant that it tended to fold along the former cuts. Because of a desire to minimise evidence of past intervention, the Japanese paper repair strips front and back were carefully colour matched to the underlying barkcloth using acrylic paints, in-painting the linear designs and using a gloss acrylic medium to achieve appropriate sheen. Once the skirt was re-joined, the missing corner became more apparent (visible in Figure 21.1c). Creating a physically attached infill for this section of the barkcloth was felt to be neither necessary nor appropriate, but the curator requested that this loss was disguised during the display. A temporary covering strip was placed so as to hide the whole top edge of the skirt during mounting.

Figure 21.1. Reconstruction of a Futunan salatasi: a) Before treatment. b) Applying temporary tabs from the front to align joins. c) Reverse after joining. d) Applying additional coloured paper strips from the front to strengthen and disguise joins.

Conservation of a Hawaiian malo (loincloth)

This man's dance *malo* (Registration number Oc,4804) was acquired by the BM as part of the Christy Collection in 1860-9.[1] The process of reincorporating the reference collection sample back into this malo was complicated by the fact that the sample piece and main body of the cloth did not match, either physically or visually, and required interventive cleaning and infilling treatments. The natural pale cream colour of the thinly beaten paper mulberry barkcloth was heavily soiled, creased and had yellowed due to coloured by-products formed during the ageing process and breakdown of the cellulose. The sample piece was much whiter and fresher looking; once again previous treatment was likely and it was suspected that the sample had been washed.

Conservation wet cleaning of barkcloth is not routine, largely due to concerns about the water sensitivities of the beaten fibres and applied decorations; however techniques successfully explored at the BM (Pullan, 2015) and preliminary research undertaken by Antonowicz-Behnan (2018) both suggest that controlled aqueous cleaning treatments can be safely undertaken. It was decided to wet clean the main section of this Hawaiian *kapa* in order to bring the two pieces closer in appearance prior to joining them. Following surface cleaning and wet fastness testing of the red and black printed designs, the cloth was washed in softened water in a series of alternating 15-minute soaks and gentle running rinses, over the course of an hour (Figure 21.2a). No detergent was used, and minimal sponging was carried out. Given its size, the thinness of the cloth and its reduced wet strength, the garment was supported on a sheet of non-woven polyester Reemay®

1 Previously in the collections of the Haslar Hospital.

throughout the cleaning process. The immersion technique successfully flushed out the yellow discolouration, removed surface dirt and relaxed creasing. No change in surface morphology was noted under magnification, and surface pH tests showed the process had reduced acidity, which will improve the long-term stability of the cloth.

There was much discussion about levels of cleaning for the exhibition. Many cloths were soiled with ingrained particulate dirt – frequently accumulating locally on the exposed outer surface of folded cloth. Other cloths were water damaged and stained. Often this soiling could not be removed using surface vacuum or sponge cleaning methods. To what extent was it appropriate either to display visibly dirty barkcloth (even if this soiling has occurred as the result of use) or for the conservator to carry out interventive wet cleaning treatments, particularly when there is no real tradition of washing barkcloth? The need for an awareness of the cultural sensitivities regarding western conservation interference in these objects, succinctly expressed in the phrase 'less of you, more of my ancestors' (Iacchei, 2017), was illustrated during recent discussion regarding the cleaning of a Pitcairn barkcloth in the BM collection with Pauline Reynolds, herself a barkcloth maker of Pitcairn descent. With a known maker provenance, it was important that any cleaning of this cloth did not remove the 'blood, sweat and tears' of her ancestresses.[2] This is counterbalanced by conversations with various community groups about their desire for this material 'to look its best', particularly when presented to a worldwide audience, and their trust in museum conservators to undertake any necessary treatments sensitively and appropriately.[3] A fine white Marquesan barkcloth (reg no Oc1954,06.320) was ultimately not displayed because it was felt by the curator to be too heavily marked by ingrained dirt. It was considered important that the museum visitor could appreciate the quality and value of these highly prized plain white cloths.

On aligning the two pieces of the malo it became evident that additional 'trimming' had taken place leaving an L-shaped gap of up to 15mm between them. A three stage process was used to construct the join. Firstly, strips of lightweight (12gsm) Japanese paper were applied to the back of the cloth to hold the two pieces together in position (Figure 21.2b). Temporary tabs as used in the previous example were not required as the cloth was thin enough to see the designs through it. Then a second strip of paper was carefully water-cut and adhered in place from the front as an additional infill in the areas of loss (Figure 21.2c). This infill, pre-toned with a dilute wash of acrylic paints to match the ground colour of the barkcloth, provided both additional structural body to the lightweight support paper initially used to make the join, and a visual infill for the missing material. Further loss compensation for the missing printed design was added in the third stage with the application of separate shorter strips painted with the zigzag motif (Figure 21.2d). As they were primarily for cosmetic purposes, these infills could later be easily removed without compromising the rest of the support. By using Klucel G rather than starch paste as the adhesive to apply these final patches, they could be removed using a solvent without affecting the water-based adhesives used to adhere the rest of the support patches.

2 Personal communication, 8 August, 2019, British Museum.

3 Most recently, personal communication with Reggie Meredith Fitiao, contemporary barkcloth maker from American Samoa, on 23 March 2018 in Glasgow.

Figure 21.2. a) Wet cleaning to remove discolouration. b-d) Reintegration of sample piece into a Hawaiian loincloth.

Conservation of an indigo dyed barkcloth from Santa Isabel, Solomon Islands

This thick and coarse cloth (Registration number Oc1980,Q.470, possibly of banyan fibre),[4] dyed using *pau*, wild indigo, was in sound condition but with several sizeable holes corresponding to areas of staining. These losses were felt to distract from the serpentine design with which the cloth was decorated; this design conveys significant local knowledge and custom, described by Solomon Islander Reuben Lilo as relating to the highs and lows of life, particularly sickness and death.[5]

Losses and tears in barkcloth are usually patched using a range of Japanese papers. In this case the smooth and uniform texture of the available papers did little to draw the eye away from the points of damage in the fibrous barkcloth. Instead beaten *kozo* (paper mulberry) fibre was used.[6] One of the key raw materials in Japanese paper making, kozo is composed of the same paper mulberry fibre used to make many barkcloths. Less processed than the Japanese papers, this fibre allowed us to create textured repair materials, more suited to this barkcloth. The fibre was soaked in water, pulped in a blender and dyed a range of blue and brown shades. The pulp was dyed with the same Solophenyl dyes used for dyeing cotton fabric, benefitting from the extensive dye recipe library of the textile conservation studio. Fills of suitable shape, thickness, and colour to suit each individual area of loss were made by applying the pulp on a vacuum suction table (as seen in Figure 21.3a-c). Made

4 Collected by the Rev. Henry Welchman, Melanesian Mission,1889-1908.

5 Personal communication during the AHRC funded research project *Melanesian Art: Objects, Narratives and Indigenous Owners*, a joint initiative between the BM and Goldsmiths College, University of London, 2005-2010.

6 Available from craft paper maker suppliers www.artvango.co.uk.

Figure 21.3. Use of beaten kozo fibre to create pulped fills for losses and textured repair patches.

separately from the barkcloth to avoid the water borne pulp saturating the cloth, templates of card and Melinex® (polyester film) helped act as a guide to the shape and depth of the fill. In order to match the mottled appearance of the cloth, different coloured pulps were applied to re-create the edge of the serpentine design and blend in with the brown stained areas surrounding the losses. Once dry, these fills were fixed in place on the barkcloth with paper tabs, which means they are easily removed.

The beaten kozo fibre was found to be an extremely versatile repair material. Repairs to splits in a yellow barkcloth from the Marquesas (Oc1934,1107.2) with a fibrous and open, lace-like structure were secured using the kozo fibre. Instead of pulping, strips of fibre were soaked overnight and then teased apart with tweezers to create small patches of a long fibred mesh structure, which, once coloured with acrylic paints, perfectly matched the texture of the cloth (Figure 21.3d-e).

Mounting the barkcloth for display

The decision to focus on barkcloth as clothing, and the wish to inhabit the dress, made mounting the exhibition a challenge. The largely non-tailored garments are difficult for western audiences to interpret. Flat sheets or strips of barkcloth would have been worn draped, wrapped, folded, pleated, looped, layered or tied. In addition to the more easily relatable loincloths, skirts or shawls, the exhibition included long strips of Fijian *masi* and large sheets of Tongan *ngatu* which would have been wrapped or looped voluminously around the wearer. Whilst there have been some visually striking displays of these garments on posed mannequins in other museums, these have usually made use of newly commissioned material. Even though many

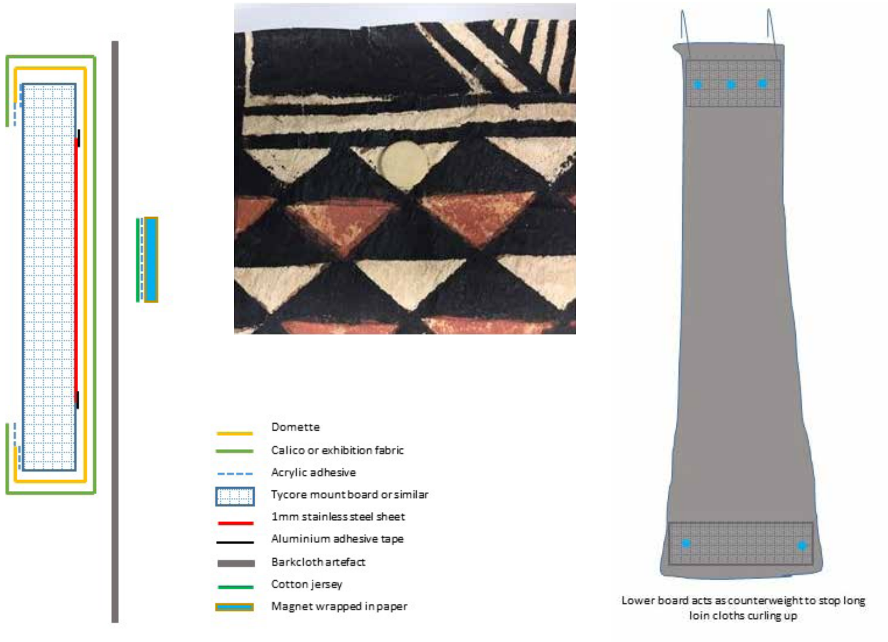

Figure 21.4. Diagrammatic representations of the magnet mounting system used to hang the barkcloth.

of the cloths chosen for this exhibition were in sound condition, they were stiffened or had locally embrittled areas, often corresponding to the deterioration of the decorative media. Concern for the mechanical damage that would potentially be caused by the creasing and folding of the cloths meant that, with the exception of two newly commissioned pieces, it was not possible to 'dress' the historic pieces on mannequins. One of the first decisions made was an agreement to present the barkcloth as flat lengths of cloth. The use of accompanying contemporary and historic photographs and illustrations therefore became integral to the design of the display and were used to great effect in bringing each piece to life and allowing the visitor to appreciate the many forms of dress.

The tall but relatively shallow wall cases in the gallery offered the opportunity to show many of the cloths in their entirety. The challenge came in finding a method of hanging them vertically without pinning or stitching. The use of nails and tacks to hang barkcloth in the past has left a legacy of tears, edge distortions and small holes, often with accompanying damage due to rust stains. Other previous mounting solutions found in the collection included cotton tapes sewn across the top of one cloth and pole sleeves of paper added by adhering looped strips of strong paper to the upper edge of the cloth using starch paste. Smaller cloths have also been affixed to acid-free card mount boards in a technique usually used to mount prints and drawings.

Magnets have increasingly been used to mount artworks, textiles and barkcloth in many museums and by many conservators. This exhibition was the first time conservators at the BM had employed their widespread use. A magnet mounting system generally consists of three parts (Spicer, 2017): 1) the magnet, 2) the surface to which the magnet will attach, and 3) any materials (including the object) which go in between. Each of these three elements can be varied to tailor the mount to the specific needs of the object. For the barkcloth exhibition, neodymium circular disc magnets were used in two different sizes and strengths: larger 15mm diameter x 2mm thick (1.65kg pull strength) and smaller 8mm diameter x 1mm thick (0.40kg pull strength), used according to the size and weight of the barkcloth.

Each magnet was prepared by encasing it in paper, wetted out with adhesive to allow it to mould around the magnet. The paper coating enabled the magnets to be painted to match the barkcloth, protected the magnet against breakage (neodymium magnets are very brittle) and provided one of the cushioning layers between magnet and barkcloth. A further cushioning pad of cotton jersey fabric was adhered to one side of the larger magnets, having taken care to identify the correct 'attracting' face. As the 'receiving' surface, strips of 1mm thick stainless steel sheet were either stuck onto lightweight foam board, or more neatly embedded in Tycore acid free card honeycomb board, held in place using aluminium foil adhesive tape. These boards were wrapped in a layer of thin cotton domette before a final covering of cotton calico – both of which served to further mitigate the force of the magnet. Lengths of nylon line attached to the fabric wrapped boards provided a means of suspending both board and barkcloth from the ceiling of the display case. By cutting the boards slightly smaller than the cloths themselves (for more robust cloths a 150mm high batten behind the top edge of the cloth sufficed) the supporting board could remain invisible and gave the impression of the barkcloth hanging freely in space.

A degree of trial and error was required to determine the strength, number and positioning of the magnets, and the number of interleaving layers to be used. Cloths were hung experimentally in the conservation studio and monitored for slippage and evidence of surface damage. It was found that 15mm diameter magnets positioned approximately 15-25cm apart along the top edge of the cloth were generally sufficient to secure most pieces. For the Futunan cloth (measuring W170cm x H112cm) and the Solomon Island cloth (W154cm x H125cm), six of the 15mm diameter magnets were needed. The smaller 8mm diameter magnets were used to hang the lightweight Hawaiian malo (W85cm x H228cm) although the intermediary layers were reduced. The magnets (22 in total) were positioned at intervals along the top edge and down each of the long sides, securing the cloth to a board cut slightly smaller than the cloth itself. By using these individual magnets the naturally occurring undulations of the cloth could easily be accommodated. The mounting system could easily be adapted to suit cloths of different shapes and sizes: for a group of tapered loin cloths from Papua New Guinea an additional narrow board was attached to the bottom of each barkcloth to act as a counterweight preventing the natural tendency of these cloths to curl up at the ends (Figure 21.4). A large Samoan cloth (Oc1924a) measuring over 2.5m square was wrapped around a padded board, and secured using magnets to the back of the board. Over the course of the year-long display no evidence of slippage was noted. The magnets, although visible, were discreet and unobtrusive. On de-installation no permanent deformation or damage to the barkcloth surfaces was found to have occurred as a result of the mounting system.

Conservation decision making and community voices

The emphasis of this chapter so far has been to highlight a range of practical techniques employed by conservators in treating and mounting barkcloth for display – to show what is possible and to demonstrate some of the decision making processes. As can be seen, underpinning many of these decisions was consideration for the artefacts' originating indigenous communities.

Collaboration between museums and source communities in the curation of displays of indigenous material heritage is no longer unusual. The results of interactions are reflected in object selection and methods of display, new perspectives and narratives, and cultural permissions for the use of objects. There is often reciprocity through such collaborations, with work on museum collections acting as a trigger to cultural revitalisation and production of new art (Adams, 2010; Carillo-Huffman et al., 2013). The process, outcomes and benefits of community consultation in the development of the British Museum's *Indigenous Australia: Enduring Civilisations* exhibition – which ran concurrently with the (albeit much smaller) *Shifting Patterns* barkcloth show – are described in Sculthorpe (2017). This illustrates how the Museum aims to work in respect to its indigenous collections, including how community negotiations with conservation staff led to the appropriate display of a Torres Strait Island mask, with the human mandibles shielded with discreet covers. This last example shows that community engagement is also no longer new in conservation. Stakeholder representation is one of the central tenets of conservation ethics and codes of practice around the world, and the integration of 'non-technical expertise' is part of modern conservation theory (Muñoz-Viñas, 2005). But how do these interactions play out for the conservator?

Case histories examined by Henderson and Nakamoto (2016) demonstrate how, in practice, consultations between conservators and community stakeholders commonly focus on the use, meaning and significance of an object, and there is 'less ease when the consultation strays into the aspects of conservation practice', where the conservators tend to fall back on their own technical authority. They do however find that conservators who work with first nations collections are often at the forefront of discussions about stakeholder input. Collaboration between the Smithsonian National Museum of Natural History (NMNH) Anthropology Department conservators and community scholars, including barkcloth makers from Hawai'i, Samoa, Fiji and the Cook Islands, played a significant part in the Wilkes tapa project (Austin-Dennehy et al., 2013). The community scholars' contributions appeared to centre largely on subjects such as materials and dyes choices, consideration of condition, and a sharing of their own tapa making processes. The treatment approaches (cleaning, humidification, repair) were grounded in Western conservation practice. Contemporary community knowledge could not, for example, provide an explanation for the use and deterioration of *māmaki* fibres found in some Hawaiian cloths, but the forging of new personal friendships through projects such as this is hugely important in building trust and mutual respect from which further collaborative investigation and study can continue (as demonstrated in Chapter 3).

The community-led decision making in the conservation of the monumental sculpture of Chief Kamehameha I in Hawai'i (Wharton, 2008), where a public vote was taken on whether the conservator should paint or gild it, makes a great story and illustrates the translation of theory into actual practice. The conservator expresses his desire to facilitate and inform choices without influencing the final decision. The community wanted authenticity in the sculpture, but needed to consider whether this was authentic to the artist's intent (conservation revealed the original sculpture had been gilded), authentic to the sculpture's pre-conservation state, (up to 24 different paint layers had been revealed during conservation), or authentic as a representation of the chief Kamehameha. This last option was chosen, and the sculpture was painted in a new colour palette, giving 'accuracy' to skin tone and the colour of the chief's feathered garments. Wharton voices no ethical conflict in carrying out this work, and the interaction of the community with the sculpture, and the establishment of new patterns of public cultural involvement were as much part of the conservation project outcomes as the physical stabilisation of the sculpture.

Extensive community consultations were embedded within the conservation preparations for the 2004 opening of the Smithsonian's National Museum of the American Indian (NMAI) in Washington, DC (Johnson et al., 2005), and went on to have considerable impact on conservation work. Conservators were actively guided in their treatments by representatives of 19 native communities, in recognition of the fact that 'native communities who hold the knowledge and expertise are seen as the authorities to properly identify how objects should be cared for and conserved.' As one of the leaders in developing models for such interaction, and benefitting from well-established relationships with active and informed cultural groups in North America, the NMAI conservators highlighted many useful pointers for any conservator daunted by embarking on such work – recognising that this is a process much less familiar to the conservator than to the trained anthropologist. These included formalising the consultation process with stipends and signed permissions; the importance of hospitality and time, allowing for prayers/ceremonies, and the building of trust; and the real skill in listening first and formulating questions designed to elicit responses useful to the conservator. Conservators needed to relinquish their naturally protective nature concerning the handling and use of museum artefacts. The outcome was sometimes that conservators did not carry out treatments although, conversely, sometimes more extensive restorations were requested. There was potential for conflict between native communities uncomfortable with the minimal stabilisation approach of the conservators, perhaps feeling this would not allow the artefacts to represent their communities well, and conservators reluctant to carry out more restorative additions or replacements. This could be overcome with opportunities for conservators to carry out treatments collaboratively with tribal members, each contributing their own expertise, keeping restoration materials distinguishable from the original, and ensuring the object was thoroughly documented before, during and after the intervention.

In the conservation of barkcloth for the BM *Shifting Patterns* exhibition, there was neither time nor resources for consultation on this scale. Instead, the conservators were able to benefit from the curator's knowledge and their community relationships. This indirect method of consultation, often by email, provided guidance on questions such as the re-joining of cut pieces, infilling losses and cleaning. It was not surprising that feedback tended to favour options providing visual improvement and reintegration. There is however no substitute for the conservator to develop their own personal relationships with source communities. Witnessing the emotional reaction often expressed by indigenous visitors encountering artefacts in the museum, goes a long way in ensuring their concerns remain at the forefront of the conservator's mind during all aspects of conservation work. Conservators at the Museum are addressing this need and are increasingly playing a more active part in the already well-established curatorial relationships, and programme of visits and consultations, where perhaps previously it had been felt not to be a conservation related matter. This requires a commitment by managers for time and resource to embed this into core activities, and is now reflected in the recently approved BM Collection Care research strategy (Smith, 2019).

A particularly successful outcome of this project, and surely one of the key roles the museum conservator and scientist can play in these engagements, was the carrying out and sharing of detailed object documentation, description, technical analysis of construction and materials, and identification of fibres and colourants (Tamburini et al., 2019). This information has already been put to use by artists at the Centre des Metier d'Art (CMA) in Tahiti, in reproducing copies of historic works, reviving traditional techniques, exploring materials and inspiring contemporary art.[7]

Conclusion

The exhibition offered a wonderful opportunity to showcase Pacific barkcloth to an international audience largely unfamiliar with this material. Highly positive reviews on social media showed that it came as a revelation to many, and certainly dispelled misconceptions that clothing made from tree bark would be rough and brown. As well as finding sources of inspiration for printmaking, quilting and graphic design amongst others, visitors clearly sensed the pride which today's Pacific Islanders have for this material and came away with a greater knowledge of Pacific peoples and an understanding of a living and resurgent tradition. Working within a professional ethical framework, the conservator is always keenly aware of the impact of any conservation intervention, and the risks of removing or altering material. However ensuring that the objects were in suitable physical condition for display necessitated more than securing their structural integrity. Working closely with the curator, it became increasingly apparent that treatments were required to ensure that the barkcloth was shown to full advantage, particularly when set in the context of a museum displaying the best artefacts from the world's cultures.

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The author would like to acknowledge colleagues at the British Museum, in particular conservators Vania Assis, Misa Tamura and Bronwen Roberts who collaborated on the work discussed in this article, as well as Helen Wolfe for her work in mounting the cloths and exhibition curator, Natasha McKinney.

7 As witnessed during the author's visit to the CMA in November 2019 as part of the BM Research Fund project *Tahitian Mourner's Costume: Materials and Meanings.*

22

Conservation as Part of 'Situating Pacific Barkcloth in Time and Place': Improving Preservation, Enhancing Access and Sharing Knowledge

Frances Lennard, Reggie Meredith Fitiao,
Su'a Tupuola Uilisone Fitiao,
Ruby Antonowicz-Behnan, Beth Knight

Introduction

Based at the University of Glasgow's Centre for Textile Conservation and Technical Art History, the *Situating Pacific Barkcloth in Time and Place* project benefited from the Centre's expertise and knowledge in the analysis, preservation and interpretation of culturally significant objects and artworks. As described in the introduction, the project aimed to take a new, object-based, approach to the study of Pacific barkcloth, taking the cloths themselves as the starting point to investigate tapa as a material. Conservation encompasses many disciplines, including history, technology, science and material culture as well as manual skill, and it provided a strong foundation for a multidisciplinary investigation of this specialised material, with the conservator's experience of looking very closely at objects a key starting point (Gentle, 2010). Conservation was a fundamental part of the project with Research Conservator, Misa Tamura, working alongside the Historical and Scientific Research Associates, Dr Andy Mills and Dr Margaret Smith.

Conservation is a continually developing field; changes in the textile conservation field over the last 60 years are illustrated in contributions to Brooks and Eastop (2011) and Lennard and Ewer (2010). Since the 1980s there has been a growing recognition that treatment decisions should not be made on the basis of objects' physical condition alone, but that their social and historical contexts also play a role (Eastop, 1998). Conservation decision making is informed by the synthesis of many factors: an object's construction and materials, its physical condition, and its history and context, role and future use. It is now recognised that stakeholders, including particularly the makers of the objects which survive today in our museums, or their descendants, should have input into conservation decisions (Clavir, 2002; Johnson et al., 2005). These changes have taken place within a broader re-examination of the place of the museum in society, which has shifted the emphasis from the objects and

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collections themselves to the people who created, donated and interact with them (Simpson, 2006; Marstine, 2011), a development recognised in conservation codes of ethics. The first principle of the code of ethics of the Australian Institute for Conservation of Cultural Material states that: 'All actions of AICCM Members must be governed by an informed respect for cultural property, its unique character and significance and the people or person who created it.' (AICCM, n.d.). The conservation carried out as part of the project was driven by this ethos. Tamura began her post with a month-long period at the National Museum of Natural History, part of the Smithsonian Institution in Washington, DC (NMNH). She worked with staff there, particularly Curator of Oceania and project co-investigator, Adrienne Kaeppler, and conservator Michele Austin Dennehy, learning from their experiences of treating barkcloth and of working with community scholars from the Pacific on previous projects (Austin Dennehy, 2017; Hansen, 2017). Contact with Pacific barkcloth makers and museum staff responsible for barkcloth collections in the Pacific and in Glasgow were also invaluable in informing our views of what is significant about the artefacts (Reynolds, 2018). The intangible aspects of barkcloth – the skills of making, the history of using tapa and its connections to ancestors – are intricately bound up in the physical objects present in collections, and the conservator plays an important role in ensuring that these too are preserved (Smith and Akagawa, 2009).

This chapter focuses on two different aspects of the project which highlight the contribution of conservation: the physical treatments intended to facilitate access to two collections of historic barkcloth and enhance their long-term preservation, and the exploration of the wider intangible properties of barkcloth, particularly through interaction with barkcloth practitioners, which also play a significant role in determining conservation approaches. The project had wider benefits for conservation students, in both these aspects, and these are also discussed.

Interventive treatment: enhancing preservation and improving access

A central aim of the project was to investigate conservation approaches for barkcloth, and to use these to improve both physical and intellectual access to the collections at The Hunterian and the Economic Botany Collection (EBC), Royal Botanic Gardens, Kew (see Chapters 16 and 17). The significant collection of mainly flat cloths at The Hunterian had not been easily accessible to researchers before the project, mainly due to pressures on storage space alongside the lack of information on provenance, discussed by Mills in Chapter 16. The EBC had previously worked hard to make the collection available to researchers and community representatives, but the objects were challenging to examine due to similar pressures on storage space. Many of the Kew objects were large, with some three-dimensional garments; this together with the configuration of the store meant that boxed storage was preferred.

The project included funding for conservation treatment, an acknowledgement of conservation's role in enabling and facilitating access to objects. The Research Conservator's contribution included both research into conservation treatments for barkcloth and the physical conservation of the two collections; she focused on improving storage with some treatment of objects in vulnerable condition, primarily to make them safe for viewing. Improved storage conditions go a long way to enhancing the long-term preservation of vulnerable organic objects especially, as here, where many of the artefacts are large and

Figure 22.1. The Research Conservator carrying out the conservation treatment of a Tahitian *tiputa*, a poncho-like garment (Kew, EBC 73329).

in less than optimum condition. Most of the barkcloth was in fair condition, but many cloths were stiff and brittle; some had been folded and could not be unfolded easily without first making the cloth more pliable through humidification treatment. The majority of the Hunterian tapa objects were rolled onto new acid-free tubes using appropriate inert materials for wrapping; it was a happy coincidence that the move of the Hunterian collections into new storage facilities in Kelvin Hall was taking place concurrently and provided additional storage space. The Kew collection was re-housed where necessary; boxed storage remained the most appropriate format for this location, but objects were re-packed in such a way that the most important features were visible on opening the box, to save unnecessary handling. Larger, and more stable, boxes were provided for some vulnerable objects and boxes were clearly labelled to prevent unnecessary unpacking of the barkcloth.

Some interventive treatment of the collections was also carried out (Tamura, 2018; Tamura forthcoming; Figure 22.1). While it was expected that the cloths from both collections might occasionally be displayed, the main focus of treatment was on reducing soiling and relaxing creases, to avoid long-term chemical and physical damage, and to enable good visual access. We were alert to signs of previous use and wear, and these were never removed. The intention was mainly to reduce soiling which had built up over years of museum storage, particularly sooty soiling on Hunterian objects. This related to their storage in the original Hunterian Museum sited in Glasgow city centre before the University moved to its present location in the west of the city in 1870 (see Chapter 16); they had been folded and stored on open shelving, resulting in patches of particularly noticeable soiling. Humidification of creases was also undertaken to ease the distortion of some cloths and facilitate safe rolled storage, while taking care to avoid flattening the natural undulations of the cloths. Tamura also undertook selective support of damaged areas and tears where these made the cloths vulnerable to further damage when handled, particularly on the edges of cloths for example. Support was generally provided by the application of patches of an appropriate grade of Japanese paper, adhered with wheat starch paste; Tamura developed the use of re-moistenable starch paste-impregnated paper to avoid the need to continually make fresh batches of paste. The patches were usually toned with dyes to give them an unobtrusive appearance. This treatment, as well as enabling direct physical access to the objects, also allowed photography to be carried out more safely in some instances, thereby also providing improved digital access to the collections. Images of the Hunterian and Kew tapa collections are hosted on the project website, *Situating Pacific Barkcloth in Time and Place*.[1]

Learning from tapa makers

One aim of the project was to pass on information about barkcloth as a material, and about treatments to other conservators; the published literature on barkcloth conservation is not extensive (though see Rose et al., 1988; Barton and Weik, 1994; Wright, 2001; Pullan, 2015; Uden, Richardson and Lee, 2016). Project research was disseminated at a practical workshop for museum conservators held at the University of Glasgow in March 2018, and at a larger, international conservation symposium at Royal Botanic Gardens, Kew in December 2018 (Tamura, Ridley and Lennard, forthcoming). The group of conservators attending the workshop, many of whom were charged with the care and treatment of barkcloth in their home institutions in the UK and the Netherlands, included specialist textile, paper, objects and world cultures conservators, demonstrating the range of museum categorisations into which barkcloth artefacts may fall. One particular highlight of the workshop was the opportunity to work with Reggie Meredith, a barkcloth practitioner and siapo maker, and Su‘a Tupuola Uilisone Fitiao, a traditional tattoo master and a contemporary artist, from American Samoa, introduced to us by Adrienne Kaeppler. They had previously travelled to the USA to take part in the NMNH projects involving community scholars from the Pacific (Austin Dennehy, 2017) which had contributed enormously to museum staff’s understanding of objects in the US Exploring Expedition collection, the techniques and processes of making *siapo* (Samoan barkcloth) and its cultural significance in Samoa. The much greater collaboration between museums and their source communities in evidence in the last two decades has been a ‘two-way process, with information about historic artefacts now being returned to source communities, and with community members working with museums to record their perspectives on the continuing meanings of these artefacts.’ (Peers and Brown, 2003: 1; also cited in Curtis, 2015; see also Bisulca, Schattenburg-Raymond and Du Preez, 2014).

In Glasgow the practitioners gave delegates, as well as project researchers, collaborators and textile conservation students, the chance to beat their own *u‘a* (bark) and also to try out traditional techniques of decoration. This provided those of us lucky enough to take part with an unforgettable experience which really brought alive the cultural traditions manifested in the historic pieces and informed our understanding of barkcloth as a material, so critical for conservation practice. On a basic level, the workshops gave those of us with no or little previous experience of barkcloth making, the opportunity to begin to gain a physical understanding of the way tapa is produced from the raw inner-bast

1 Available on the University of Glasgow website at: https://tapa.gla.ac.uk.

Figure 22.2. Workshop participants painting Samoan siapo with pandanus keys and oʻa dyes, under the supervision of Suʻa Tupuola Uilisone Fitiao and Reggie Meredith.

strips of uʻa or paper mulberry (*Broussonetia papyrifera)*. The dried strips were soaked in water for a short period to soften them slightly before beating. It was instructive to begin to understand how much pressure of the beater was required to spread the fibres, and very easy to beat too much in one area, leading to thin patches. It took surprisingly little time to beat out a small section which was then folded and beaten again in traditional Samoan style. Workshop participants were also able to learn more about traditional Samoan decorative materials and techniques and to try these out for themselves. Designs were painted with the keys from dried pandanus fruits which made brushes with the perfect properties for painting, using a traditional brown colourant, *oʻa* (from the bark of the bishopwood tree, *Bischofia javanica*), to which soot was also added to create a black colourant (Figure 22.2). We learned the meaning of the traditional symbols, derived from Samoan flora and fauna and linked to tattoo patterns, and saw how Fitiao combines these motifs into contemporary designs. The workshops produced two larger pieces of siapo, designed by Fitiao and communally painted (with varying degrees of expertise) which now form part of the project's reference collection.

The sessions were extremely valuable for everyone who took part in them and discussion with Meredith and Fitiao enriched the whole project team's understanding of siapo, and tapa more generally. On a straightforward note, the discussions will help us to recognise Samoan dyes and motifs as well as the traditional methods of making siapo found in the historic cloths – one of the conservators commented that now she would recognise evidence of folding in barkcloth as evidence of making. For conservators, having a deep understanding of the way an object is made is critical to an understanding of its physical properties, the way it degrades and from that, the most appropriate methods of conservation treatment. Historic barkcloths in collections tend to be relatively stiff and brittle, though in general they appear quite strong still, unless damaged by the intrinsically harmful effects of oiling, smoking or the application of dark brown, iron and tannin-rich colourants. Being able to relate these physical properties to the condition of newly beaten barkcloth is invaluable and enables conservators to distinguish more clearly between features of the original construction and the effects of use and long-term display and storage. Physically creating a material is in itself a more effective method of learning than simply looking at artefacts or images of production techniques. 'Learning by doing' produces a much deeper level of understanding and, as Bunn describes, 'Making gives us access to a different way of thinking about human relationships with objects' (Bunn, 2011: 37).

It was also interesting for us to elicit Meredith and Fitiao's views on the conservation of historic cloths in museums around the world. They told us that they were touched by the care given to these pieces by conservators and curators, especially as 'nothing lasts like this at home' in tropical conditions. When asked how important it was for them to see Samoan objects in good, clean condition in a museum, they commented that they would want to choose the best objects to showcase Samoan culture, although soiling, for example, could be acceptable as evidence of maturity. Fitiao commented that 'an older one is more powerful' and that in this case, blemishes are not important. Traditionally cloths would not be cleaned, they would be replaced by new cloths, so older barkcloths in museums can be considered as heirlooms and important links to family. During the project, researchers visited the Pacific and talked to barkcloth makers and enthusiasts there, an invaluable experience as evidenced in Chapters 3, 5 and 19. However it was also really valuable for the exchange to happen in the opposite direction, enabling a larger group to benefit from the chance to make barkcloth and to learn directly from Meredith and Fitiao about its manufacture, meaning and use. Even more importantly, they were able to bring alive for us the cultural significance that barkcloth had, and still has, in Samoa. One of the conservators commented 'I totally understand tapa now' and added that in future she would feel that she was not just conserving an object but 'a whole cultural history'. They made Samoan siapo a living experience for us all. Their perspective, as described below, demonstrates the benefits for both sides of the collaboration.

Tapa workshop in Glasgow, UK in 2018

Reggie Meredith Fitiao and Su'a Tupuola Uilisone Fitiao

It's an honour to be called on to share with others something that means a great deal to yourself, your family and your culture. It's also an honour to know there are others who have an interest and a deep concern for the material culture of your country. The journey to the United Kingdom as invited guests of Frances Lennard and the University of Glasgow School of Culture and Creative Arts was to engage in an ongoing project entitled *Situating Pacific Barkcloth in Time and Place.* The invitation was to work with students, conservators and academics interested in processing bark cloth. The visit developed into a rich and meaningful exchange of information that made the trip so worthwhile.

Our goal was to share what we do in American Samoa as siapo practitioners, which included the making and processing of inner bark bast to cloth, and the handling of the bark and its cultural materials used to create a finished painted tapa. There was with this interaction, however, a renewed understanding of how much research goes into tapa cloth and its components and how important it is to those who manage collections of Pacific material culture. The attention to detail such as fibre and dye analysis, the storing procedures along with descriptive presentations of research presented during the three day workshop was truly impressive and admirable. I could only fathom the hours of work that were conveyed through the words, and images of each presenter. We were renewed with a sense that tapa has a profound place in our world both past and present. It is extensive and meaningful; a cultural treasure filled with wonder because it belongs to a broad range of cultures. It is as if the very fibres of the material reached beyond itself to capture the attention of others who see it, and feel it and want to gain more knowledge about it. We were intrigued by the focus of this project because it pinpointed the main element of tapa – the actual bark – and there was a quest to better understand tapa on a more physical level with the u'a (paper mulberry) itself and how it is processed and handled from tree to cloth.

Our love for siapo was enhanced by previous work with the National Museum of Natural History, part of the Smithsonian Institution in Washington, DC with Dr Adrienne Kaeppler, for the 2013 tapa project of the Wilkes Exploring Expedition, and then the following year under a grant awarded by the Recovering Voices Program. Both visits enabled us to delve deeper into the tapa of Samoa and the Pacific. Its impact has certainly had a profound effect on us with an outcome of research culminating in a paper for the publication, *Tapa: From Tree Bark to Cloth: An Ancient Art of Oceania (*Meredith and Fitiao, 2017*)*.

Our thoughts about making siapo led us to request that we include in the workshop the actual painting and designing of the cloth using natural dyes and materials to get a full sense of tapa fabrication. As siapo practitioners, our primary concern was preparing for the workshops which included the preparation of u'a bast, scraping trees for the dyes, and gathering *paogo* (pandanus) brushes ready for transport. Our patch of u'a, growing in Leone in American Samoa was thriving and ready to harvest. But we had concerns about the transport of the bast material to the other side of the world. We had to consider the climate differences, harvest time and what mishaps might occur with the u'a from cutting and processing, to the point when the material would be beaten into a piece of cloth. If the u'a bast is left moist, it could mildew, but if soaked too long, it could disintegrate. We tested a drying method and a freezing method and both seemed to control the moisture content in the u'a. We bought a cooler and packed our u'a and materials for transport. Both the dry rolled u'a bast and the frozen u'a bast travelled well and were in great working condition.[2] For the dried u'a bast, a warm water soak of 30 to 45 minutes seemed to provide adequate moisture to begin beating, while merely thawing out the frozen u'a appeared to be sufficient. I brought along my *i'e* (beater made from ironwood, a Samoan hardwood) and Dr Kaeppler provided ten newly made beaters from Tonga.

2 A phytosanitary certificate from the Department of Agriculture was also needed to transport these items off the island.

Figure 22.3. A demonstration of beating Samoan u'a.

Our interaction with students and conservators was incredible. Our sharing of siapo knowledge with others in return was also an eye opener for us as well. We saw how involved the participants were with the beating of the bark (Figure 22.3), and the following of each step to get good results of a painted bark cloth. We hopefully conveyed to others the length of time and concentration it requires in making large siapo like some of the pieces in their respective collections. Overall, the coming together for an event such as this is positive for everyone. We were able to share how u‘a is processed, and how the application of significant patterns and motifs are painted on the surface of the u‘a to create a traditional bark cloth. It helped shed light on Samoan tapa in collections around the region from fabrication and application of dyes to ceremonial significance. It provided for us a better understanding of the importance of caring for the artefacts themselves, inspiring us to challenge our community, especially our young people to become more acquainted with our material culture for the sake of identity and longevity.

Student engagement

One particularly happy outcome of the barkcloth research programme, beyond its core objectives, was the potential it offered to enrich both core teaching and extra-curricular opportunities for students; those studying for the Centre's MPhil Textile Conservation programme were key beneficiaries. Masters level conservation study in the UK encompasses both academic and professional aspects of conservation training and the barkcloth project was able to enhance student learning in both respects (Henderson, 2016). Students gain practical interventive conservation experience through working on objects from a range of partner institutions, including the University's Hunterian. A long-term link with the Royal Botanic Gardens, Kew has enabled students on the MPhil programme and those at the Centre's predecessor, the Textile Conservation Centre,[3] to work on artefacts from Kew's EBC over several decades (Lennard, Tamura and Nesbitt, 2017). Kew's policy of encouraging student conservators in this way has provided unique opportunities to work on a range of plant fibre types, including barkcloth; indeed this long-term relationship was a factor in the initiation of the Pacific barkcloth project.

The project offered students enhanced opportunities to work on tapa, extending the range of materials and objects encountered. As well as Tamura's formal teaching sessions on the treatment of barkcloth, a total of 18 students from three cohorts worked with her on their study days as project volunteers (Figure 22.4). While Tamura benefited from the extra pairs of hands and the input of many hours of volunteer time, the students were able to become familiar with the material and, working alongside an experienced conservator, develop confidence in a range of treatments, including surface cleaning, humidification, support, documentation and packing. Experience of the workplace is promoted through the programme's core work placement and the students seek opportunities elsewhere, but it was a huge bonus to be able to offer access to a professional conservation project taking place in situ at the Centre and for students to witness and take part in a long-term conservation programme. Tamura's training as an objects conservator also opened up new opportunities for the students to learn about different materials – through a session on pandanus, a widely

3 The Textile Conservation Centre was established at Hampton Court Palace in 1975 and based at the University of Southampton from 1999 to 2009.

Figure 22.4. Textile conservation students surface cleaning tapa: Beth Knight is front left, Ruby Antonowicz-Behnan front right.

used plant material, for example. This opportunity for students to extend their experience of conservation techniques and processes was invaluable as preparation for the workplace. Ruby Antonowicz-Behnan's text below illustrates the further research opportunities afforded (Antonowicz-Behnan, 2018). The project also encouraged the development of transferable skills such as communication, organisation and time management, though writing for publication in conservation journals, newsletters and blogs, and helping to organise group visits to the conservation lab, workshops and other events.

Equally importantly, focusing on the treatment of world cultures objects, alongside the more common student experience of working with dress and other western social history items, enhances students' understanding of the varied roles objects can play in different societies, and the different meanings and values attributed to them (Dariusz Cutajar et al., 2016), as well as the value of world cultures collections for wider education and engagement (Worden and Richardson, 2018). Graduates of the programme work in the museum sector, many for large institutions with world cultures collections, and understanding the history and significance of the collections and their meaning for source communities is also essential (Thomas et al., 2018). Student volunteer Beth Knight was privileged to take part in a visit by Pauline Reynolds, a descendant of Pitcairn tapa makers (who writes in Chapter 14), and Knight's text below demonstrates the formative nature of this encounter. The barkcloth project was an excellent channel for encouraging the development of skills in selecting and implementing appropriate treatment options for artefacts in particular situations – whether display, access for community members and researchers, or long-term storage – extending the range of learning opportunities available to students. Broadening the range of object types with which they are familiar also anticipates the challenges that graduates will encounter in their professional careers, where museum posts often encompass a range of object types and textile conservators are faced with a vast range of materials and techniques in the core collection. This deeper understanding of the intangible properties of barkcloth is having a continuing legacy in teaching on the programme.

Research into wet cleaning barkcloth

Ruby Antonowicz-Behnan

From October 2016 I began volunteering in the barkcloth conservation lab alongside fellow students from my training programme. Working with Misa Tamura, I acquired experience in applying techniques more commonly associated with objects conservation, enabling me to broaden my skill set. In our sessions, I helped with preventive care, such as improving the storage methods of the barkcloth, and interventive treatments, namely crease removal and structural repairs using Japanese tissue and wheat starch paste. As I became acquainted with the conservation practices for tapa, I came to realise that wet cleaning treatments were uncommon and felt there was potential for research into the uses of aqueous cleaning and the effects of water on barkcloth as a student dissertation project.

What was initially interesting to me was that, while tapa cloth has been used in much the same way as textiles, its properties are quite different, and this ambiguity has meant that the conservation of tapa has been approached from multiple angles. While wet cleaning has commonly been part of textile conservation practice, this has not been the case for tapa, and I was keen to know the practical and ethical reasons for this. I was inspired to pursue a dissertation which would take up the investigation into the use of wet cleaning; in so doing, my research could contribute to the wider project, and help improve our understanding of the care of Pacific barkcloth collections. My investigation focused primarily on looking into options for safely wet cleaning and drying barkcloth, and how water could potentially affect the material and applied decoration. The range of methods I tested were drawn from the conservation literature and suggestions provided by conservators participating in a survey. The survey itself proved an invaluable resource, connecting me with conservators from a diverse range of specialisms across the globe, enabling me to draw on a wealth of knowledge and experience, as well as gain insight into the conservators' rationale for or against wet cleaning.

The survey revealed widely shared concerns over risks to surface decoration, finishes, fugitive dyes and the separation of parts and layers, as well as the risk of removing possible evidential soiling. A large proportion of conservators (10 of 17) had never wet cleaned barkcloth and the majority of those did not foresee any circumstance for wet cleaning barkcloth. On the other hand, among those who would be willing to undertake such a treatment, a significant motivation was if cleaning had been advised by a source community, or for exhibition or display demands. This result highlighted that consultation with stakeholders and the presentation of barkcloth for public audiences would both be important factors in deciding the course of action. For the seven conservators responding to the survey who had undertaken some wet cleaning of barkcloth, all found the treatment to be largely effective (Antonowicz-Behnan, 2018).

For the experimental phase of the investigation, I tested a range of options including blotter washing and float washing,[4] and found that a closed system blotter wash was the most appropriate for the type of barkcloth tested, as it could be controlled more easily than immersion washing (Pullan, 2015). Consequently I used this method to successfully clean a Tahitian barkcloth fragment (E.596/3) from The Hunterian.

Reflecting on ancestors, access and preservation

Beth Knight

Volunteering with the barkcloth project began as a way to familiarise myself with a material that spans both object and textile categorisations. While volunteering, I learned new treatment skills and gained an introduction to barkcloth. The most valuable lesson, though, was learning to adjust my conservation approaches to help connect communities with their historic objects. The treatment of several small barkcloths from the Pitcairn Islands was particularly influential in how I view my role as a conservator. Many of my treatments addressed post-collection condition issues to increase access for researchers in the future. Access is a nebulous term. I interpreted it as improved physical access through updated storage materials and greater visual access through reduction of post-collection soiling and creasing.

One Pitcairn barkcloth from The Hunterian (E.596/6) had a thin, creased section that I carefully humidified to open out after surface cleaning it, revealing a fine open network. To protect it, I created a custom folder that accommodated the barkcloth's increased size. I considered my contribution to 'access' complete after treatment. Several months later, I was thrilled when I was able to meet with Pauline Reynolds to discuss the Pitcairn barkcloths. Pauline was visiting the UK as a Pacific Partner with the Pacific Presences project,[5] and is the great (x5) granddaughter of Mauatua, the barkcloth's maker, and Fletcher Christian, a *Bounty* mutineer who settled on Pitcairn (see Chapter 14). Admittedly until Pauline's visit, I had primarily thought about the barkcloths' materiality – their tree species, their surface decoration, the beater patterns. Pauline shared stories about her great grandmother and the women of the island, highlighting the barkcloth's fineness – a point of pride. Her stories reintroduced the maker back into my understanding of the barkcloth's legacy.

The meeting with Pauline also led to my re-evaluation of 'access'. She had seen the barkcloth prior to treatment and remarked that after cleaning and humidification, it looked and felt more like it should. Touch was a key interaction. I had created storage

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4 Techniques which use minimal quantities of water, so that the object being cleaned is not fully immersed

5 See the website of the Museum of Archaeology and Anthropology: http://maa.cam.ac.uk/pacific-presences/.

Figure 22.5. Pauline Reynolds, with her daughter Mauatua, examining barkcloth from Pitcairn.

housing to lift and view the barkcloth with the aim of reducing handling (read: prevent touching) as taught in our coursework. But I realised during our meeting that museum handling ideals can continue to distance people from their objects, even when they are standing in front of them (Figure 22.5).

The barkcloth project and Pauline's visit sparked my interest in learning more about how to work considerately with communities and their objects. It led me to the National Museum of the American Indian (NMAI) at the Smithsonian Institution in Washington, DC, where I became an Andrew W. Mellon Fellow in Textile Conservation. At NMAI, consultations with native community members about appropriate, respectful care of their objects is the result of many and ongoing conversations (Cobb, 2005). As I reflected on Pauline's visit, I realised what a privilege it was to hear her stories about her community and ancestors. Technical study is incomplete without the contribution of indigenous knowledge but no one is required to share their knowledge. The decision to share can only be made by community members themselves and on the basis of trust that must be earned.

Pauline's visit showed me the direct results of being a conscientious conservator: by keeping my treatments minimal, I could help reduce some visual effects of collection on the object (though as I have learned at NMAI, this is not a universal desire – discussions are essential). There is no easy way to resolve an object's dissociation from its past life, but conservators can work to rebuild connections. Those steps must include creating environments where community members can interact with their heritage in the way that they feel is appropriate. I am only a steward. Pauline is the expert.

Conclusions

Conservation played a central role in the *Situating Pacific Barkcloth in Time and Place* project, initiating a programme of object-based research, linking science and history, and combining the preservation of both tangible and intangible aspects of Pacific tapa. Conservation has many roles: it can enhance the long-term survival of objects and collections through physical treatment and improved storage and this can enable enhanced access to objects, both physically by upgrading storage methods and stabilising vulnerable damaged areas, and visually by reducing disfiguring soiling and creasing and also by extending digital access. As the project also demonstrated, gaining a better understanding of objects' physical construction and the impact on their condition through close observation and research alongside makers, conservation scientists and curators, contributes to the wider aim of preserving both tangible and intangible properties of objects. Revealing evidence of making and use, alongside developing an understanding of the meaning of designs and fibre types, can influence our whole conservation approach. Yet, even beyond this, it is of immeasurable importance for conservators to understand what the objects in their care mean to the people whose ancestors and cultures they represent. While different views were expressed by people with Pacific ancestry who we met during the course of the project, overwhelmingly they were of the opinion that a 'western' preservation methodology, with its emphasis on preserving everything that is original while removing material such as soiling acquired after collection, chimes with Pacific community views on how best to maintain the value inherent in these rare surviving cloths and to show them respect. Hence it was never considered appropriate to intervene in a major way to restore missing features of an artefact, although this may be appropriate in different circumstances. In a global society, conservation should be a conversation with input from all stakeholders into deciding the best approach for the care and preservation of our common heritage.

The project clearly demonstrated the lessons conservators can learn from a close interaction with the objects they work on and the contribution they can make to the wider research community through gaining a deeper understanding of objects and their contexts. It presented opportunities for learning and information exchange between conservators, conservation students and, crucially, makers, as well as scientists, historians and curators. It is hoped that it can serve as a model for wide engagement in order to provide the valuable context which underpins our work as conservators, and to fulfil the potential of conservation to make a contribution to our understanding of objects which encompasses but goes beyond physical preservation.

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Afterword: Polynesian Barkcloth Past, Present, Future

Mark Nesbitt, Frances Lennard, Andy Mills

Our original research proposal set out an ambitious programme to integrate conservation, scientific analysis and art history for the study of Polynesian barkcloth. In this afterword, written just over four years after we started work, we reflect on the evolution of the project and its outcomes, and suggest some directions for future research. As with many of the chapters in this book, we write from a personal perspective: no research project is a mechanical undertaking, and this is even more true when working with tapa objects that are deeply endowed with intangible properties. As Pauline Reynolds writes of Pitcairn tapa cloths made by her ancestor, they 'represent and hold the essence of her ancestresses. They *are* therefore the ancestresses, and access to them is essential for ongoing cultural and spiritual connection.' (Chapter 14, p.197).

At the beginning of this project the programme of work with community scholars and tapa makers was incompletely articulated. Both Andy Mills and members of our advisory board urged that this strand should be accelerated; we are deeply grateful to them and to our many colleagues in the Pacific who joined the project, and this volume, so enthusiastically and generously. They are named in the book's Acknowledgements and Introduction. Museum curators and other Pacific contacts in London helped us invite visiting researchers to travel from London to Glasgow, while the Bernice Pauahi Bishop Museum and the Auckland War Memorial Museum Tāmaki Paenga Hira were superb bases for community meetings for makers from the Hawaiian islands, and the wider Pacific diaspora, respectively (Figure 23.1). These meetings both built on and reinforced the museums' existing outreach programmes, an approach we developed in our follow-on project that shared our results with curators and Pacific communities around the world.

Given the project's focus on material aspects of barkcloth, it will be no surprise that the project team spent substantial amounts of time working with tapa, both in the company of makers, and with curators in museums (Figure 23.2). Field collaborations with traditional knowledge holders in Hawai'i, the Cook Islands and Tahiti demonstrated that hands-on experimentation with the preparation and use of raw materials is absolutely essential in clarifying those aspects of tapa making that have been lost through time, although it was

Figure 23.1. Workshop participants at the Auckland War Memorial Museum Tāmaki Paenga Hira, Aotearoa New Zealand, October 2017.

Figure 23.2. Alice Christophe, Kamalu du Preez, Adrienne L. Kaeppler and Andy Mills consult kapa collections at the Bishop Museum, Hawai'i, December 2017.

necessary to be cautious in extrapolating from the present back into the past. Equally, the opportunity to handle large numbers of tapa cloths, a technique championed by Adrienne Kaeppler from the start, and to examine them under a binocular microscope, as demonstrated by project scientist Margaret Smith, were also essential. We relied heavily on the willingness of many curators to show us large numbers of pieces, a reminder that digital representations are not a substitute for generous access to physical pieces.

We gave significant time to researching the provenance of the tapa in the Hunterian and Kew collections, following lines of research pursued by Kaeppler over many years, most recently in her study of the United States Exploring Expedition. The importance of these objects' cultural biographies is two-fold: first, they lead to previously forgotten details of encounters between Polynesian peoples, explorers and settlers; second, they (with due caution) establish dates and places at which specific materials, techniques and uses are in place. Thus, much of Mills' exploration of tapa making through time and space is based on the historical studies we publish here of the Hunterian and Kew collections. In terms of encounters, this book highlights the previously incompletely recognised significance of The Hunterian as a repository of Cook-voyage objects, and draws attention to the extraordinary gifts made to Prince Alfred, Duke of Edinburgh, during the visit of HMS *Herald* to Tahiti and Hawai'i in 1869, and now housed at Kew and other museums. There is much work remaining to be done on this remarkable evidence of relatively late tapa use in these islands.

The results of our programme of scientific analysis are published elsewhere but are cited in this volume. The expertise in chemistry of the project scientist, Margaret Smith (Figure 23.3), proved crucial in the identification of dyes, using relatively well-established techniques that had been rarely applied to tapa, and in highly innovative work in the application of Fourier transform infrared (FTIR) spectroscopy to the identification of fibre source plants. Its success in identifying fibres to source genus is a major breakthrough offering the future prospect of combination with techniques of microscopic analysis pioneered by Caroline Cartwright at the British Museum. We sought to integrate DNA analysis into project work; these results are still being analysed. The gold standard for species identification would be consistent results from chemistry, microscopy and DNA – and this work is still in progress. Nonetheless, the combination of results from chemical analysis and the visual examination of modern and museum pieces of tapa bearing species identifications has enabled Mills to corroborate some strong indicators for identification of tapa fibre plants based on visual examination alone.

Plants were central to the project, even though we had limited scope for new fieldwork, and we believe there are exciting avenues for future research into barkcloth plants that are grounded in the priorities and knowledge of community stakeholders. There is great potential for ethnobotanical fieldwork in Polynesia, focusing not only on current uses, but on the memories of those still living, which encompass barkcloth-related plant uses going back up to 80 years. This work is urgent, as memories and practices disappear with time. It is vital that ethnobotany and taxonomy are integrated throughout, as highlighted in our reviews of turmeric (Plant Profile 11) and mangrove (Plant Profile 17), where significant ambiguities exist in standard literature on barkcloth species. This may in turn require further comparison of the major island floras to ensure that the species concepts applied in published floras are consistent across the Pacific – a task greatly eased by the ongoing digitisation of herbarium specimens. However, there are surprisingly few herbarium

Figure 23.3. Dr Margaret Smith using a microscope to gain a detailed view of barkcloth.

specimens from Polynesia, and these are very unevenly distributed, with a bias to island groups such as Hawai‘i that have strong botanical infrastructures. New ethnobotanical fieldwork can help address this imbalance by integrating the collection of herbarium specimens (Nesbitt, 2014).

Two further topics raised by makers and researchers during our project are the use of genetic studies to validate and refine indigenous classifications of barkcloth plants, and reversing the decline in availability of plant raw materials. The most recent work of the Seelenfreund team in identifying patterns of human migration in *Broussonetia* DNA is an exciting advance in this first topic (Olivares et al., 2019). This technique could be extended to the other ‘canoe plants’ introduced to Polynesia in ancient times. Furthermore, collaboration with makers and other Polynesian community members is required to characterise the genetics and other characteristics of the landraces or varieties of useful plants often overlooked in standard botanical surveys. The decline in availability of useful plants, whether wild or cultivated, is of increasing concern in Polynesia. The causes are complex, and include the impact of invasive plants and animals, enclosure and changes in use of land, and decline in plant use, leading in turn to the loss of traditional and sustainable management practices. Here botanic gardens and other horticultural spaces such as museum gardens are likely to have a growing role in providing safe spaces for cultivation.

A fourth strand to our project, beyond communities, museum studies and scientific analysis, was the conservation of tapa. Led by Research Conservator Misa Tamura, this strand reflected the origins of the project in conservation work carried out by students of the Centre for Textile Conservation and Technical Art History on tapa held at the Royal

Figure 23.4. Entrance to *Barkcloth: Revealing Pacific Craft*. The exhibition ran at The Hunterian, University of Glasgow, 29 August – 29 November 2019.

Botanic Gardens, Kew, and at The Hunterian, Glasgow, as well as conservation carried out at the National Museum of Natural History, Smithsonian Institution. In addition to rehousing all and conserving many of the Kew and Hunterian pieces, Tamura was also responsible for preparing pieces for scientific sampling, for hosting visitors, and training students through work experience on the pieces. The project's joint conference with the Institute of Conservation (ICON) on *Recent Advances in Barkcloth Conservation and Technical Analysis*, and the resulting publication edited by Tamura, Ridley and Lennard, represent an important opportunity to share approaches from projects in different contexts and countries. We are grateful to Jo Walsh for arranging a significant Pacific Islander presence at the conference. Several attendees raised the question of access to conservation advice for custodians of tapa in the Pacific – whether individuals or small museums. We believe this is an urgent question – and one that raises questions as to how large museums, with conservation teams, can best support smaller collections that are distant from them.

Another topic raised by Pacific community members on many occasions is the question of collections access. As described in this book, some museums in the Pacific have very well-established programmes of community access – but what about access to collections in Europe or North America for those who cannot travel? We have tried to make our results as accessible as possible, while acknowledging the result is still imperfect. The project website (https://tapa.gla.ac.uk) makes high resolution images available of the Kew and Hunterian tapa collections. The Smithsonian National Museum of Natural History collection is also available online in high resolution, with their documentation digitised too. Our view is that an important starting point for museums that hold collections from overseas, particularly those originating in a context of imperialism, is to make these as easily available as possible, subject to the cultural protocols of their source communities. This digital access is an essential first step into wider conversations around the decolonisation of museums.

Underlying our design of the project was the conviction that tapa needed time – that it was a complex, diverse, challenging material that would not respond well to short-term engagements. We hoped that three years would be sufficient to build a new material overview of Polynesian barkcloth and to resolve some of the technical challenges around identification and scientific analysis. We hope this book speaks for some of the advances made, by the project team and our collaborators. At the same time, we end this phase of the project with an increased appreciation of the complexity of tapa's history – not only the manifold interlacing of evidence from orally transmitted traditions, writings and museum collections, but also the multiplicity of contemporary voices; not only in a Polynesia spanning many thousands of miles, but in collections dispersed worldwide. In the editing of this book we have deliberately sought to retain these distinctive approaches – and sometimes differing opinions – rather than shaping them into a single narrative.

We end this project deeply hopeful for the future of tapa. The recent wave of exhibitions of Pacific barkcloth, of which our project's display at The Hunterian (Figure 23.4) is only one, are emblematic of its recognition as one of the artforms at the heart of Pacific cultures past, present and future. Museum collections must play a central role in this future, made most useful through community collaborations, reassessment of object biographies, and scientific analysis, and made accessible through the work of conservators.

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Index

MATERIAL APPROACHES TO POLYNESIAN BARKCLOTH

Barkcloth or tapa, a cloth made from the inner bark of trees, was widely used in place of woven cloth in the Pacific islands until the 19th century. A ubiquitous material, it was integral to the lives of islanders and used for clothing, furnishings and ritual artefacts. *Material Approaches to Polynesian Barkcloth* takes a new approach to the study of the history of this region through its barkcloth heritage, focusing on the plants themselves and surviving objects in historic collections. This object-focused approach has filled gaps in our understanding of the production and use of this material through an investigation of this unique fabric's physical properties, transformation during manufacture and the regional history of its development in the 18th and 19th centuries.

The book is the outcome of a research project which focused on three important collections of barkcloth at The Hunterian, University of Glasgow; Royal Botanic Gardens, Kew and the National Museum of Natural History, Smithsonian Institution. It also looks more widely at the value of barkcloth artefacts in museum collections for enhancing both contemporary practice and a wider appreciation of this remarkable fabric. The contributors include academics, curators, conservators and makers of barkcloth from Oceania and beyond, in an interdisciplinary study which draws together insights from object-based and textual reseach, fieldwork and tapa making, and information on the plants used to make fibres and colourants.

This book will be of interest to tapa makers, museum professionals including curators and conservators; academics and students in the fields of anthropology, museum studies and conservation; museum visitors and anyone interested in finding out more about barkcloth.

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