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Introduction

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The Anthropocene is a new geological era defined by human impact on the physical world, and it is characterised by such problems as climate change, pollution, and mass extinction. Given the increasing public awareness of the scale and consequences of these problems, research on the relationships between human cultures and their environments is more urgent than ever. Economic initiatives like the UN Sustainable Development Goals (SDGs) have been proposed to address these problems. However, the problems peculiar to the Anthropocene are caused by human economic activities, so attempting to solve them by promoting further economic activity is, in a sense, contradictory. Conversely, there has been little interest in the role of museums in the Anthropocene, despite the fact that many modern museums—especially those founded in the 19th and 20th centuries—have sufficient materials from before and after the beginning of the era to illustrate the transition. Public education can encourage greater support for environmentally-friendly policies, and museums—even beyond strictly ‘environmental’ or science museums—can play an important role in this regard. For example, ethnological museums can facilitate encounters between peoples as well as between peoples and other living beings.

Since the 1970s, Western museums have been called upon to play a more important role than their traditional role of collecting, storing and using academic materials. The mission to manage the collections and accumulate knowledge that took place inside the museum was called ‘old museology’ and a new museology is required, one that incorporates what society needs in the context of the museum (McDonald 2006: 2). In the West, the museum functions as a place of edutainment has been demanded early. Hands-on museums and exhibitions are one of the responses to this social demand. The reason why museums are required to take on the function of education or learning is because most museums do not deliberately exclude people based on their own qualities such as age, nationality, living environment, religion, athletic ability, or educational level, regardless of whether they require admission fees. As a result, museums can be the best place for people to connect across various social boundaries.

Since James Clifford’s 1997 essay, the concept of “contact zone” have also been the mainstream in museology or museum anthropology (Clifford 1997). While we agree with that view of recent museologists, we would still like to think of the museum as a space

that encourages us to contemplate and build an intellectual product.

Indigenous Property and Museums

We often encounter materials related to indigenous peoples when we try to practice environmental education in museums. This is because indigenous peoples have long-developed cultures that are adapted to their surrounding natural environments. Colonialism and industrial globalisation have led to major changes in most indigenous cultures. Now that modern societies have become sceptical of their own development, we can learn a lot from the traditional wisdom of indigenous peoples. At the same time, it is important to know that the material culture in which indigenous knowledge is embedded has been accumulated in museums.

On 19 and 20 July, 2018, a group of leading scholars and indigenous culture workers met at the National Museum of Ethnology in Osaka, Japan (Minpaku) to discuss these issues in the international symposium 'Ecological and Cultural Approaches to Taiwan and Neighboring Islands¹⁾'. Initially, the project built and opened a multilingual database²⁾ of museum materials in Minpaku related to Taiwan in Japanese, English and Chinese. It breaks down language barriers to accessing museum materials from Taiwan. The project held some workshops using the database in Taiwan and Japan for three years with the source community members. These things promoted the source community members to be interested in the Minpaku collection and encourage them to do their own research in Minpaku. The international symposium was organized to share the activities and results of this project and take it to the next step. This symposium was an important component of the Info-Forum Museum project 'The Ecological Adaptation of Material Culture in Taiwan and Neighboring Islands'. Following the symposium, contributors prepared an original essay based on their presentations and the group's careful discussion of their ideas (Figure 1).

This volume focuses on cultural practices and ecology in the Western Pacific, beginning with Taiwan. Today, Taiwan is a highly industrialised society with a heavy ecological footprint relative to its small size (35,000 km², including the main island of Formosa and surrounding smaller islands). As an island, it is likely to experience sea-related climate change impacts such as more frequent and violent typhoons. At the same time, Taiwan is a cradle of human diversity and a resource for ways of living with myriad creatures, including those of the mountains, forests, rivers, and oceans. In addition to the 23 million people descended from various Han ethnic groups (Hakka, Hokkien, and others from across China), there are over 560,000 indigenous people and 16 officially recognised indigenous groups, constituting over 2% of Taiwan's population. Though they have all been influenced to various degrees by contact with the Chinese, Japanese, and Western civilisations, each group has its unique cosmology and set of cultural practices through which individuals have learned to live with other living beings. These indigenous peoples are all speakers of Austronesian languages. They are thus related to other Austronesian peoples—descendants of the pioneers who, radiating outwards from Taiwan, peopled the islands of the Pacific and Indian Oceans as far as Easter Island in the East,

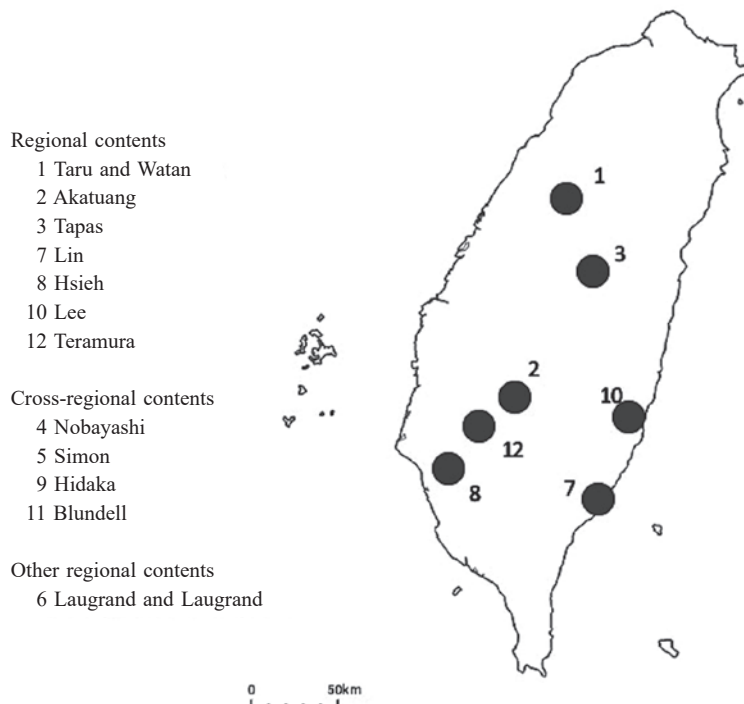


Figure 1 Focus areas in Taiwan identified by chapter number and author

New Zealand in the South, and Madagascar in the West. Austronesian peoples may also have migrated northwards to what we now know as Okinawa and Japan, leaving their influence on those neighbouring islands (though the details of this remain unknown). These Austronesian worlds may very well have important lessons about how ‘we’—humans and non-human others—can survive the Anthropocene.

The essays in this volume are organised into four thematic groups. First, we begin with the perspectives of indigenous scholars from Taiwan, who share how their peoples have constructed lifeways through relationships with plants. Second, we explore the wider context of Austronesian worlds in studies of human-bird relations and the widespread use of beads. Third, we examine the role of museums in environmental education. Finally, we look at the study of landscape and technology across Taiwan and neighbouring islands. In other words, how have people from various cultures engaged with other living creatures and non-living objects in their environment? How have these beings influenced human cultural practices and cosmologies in turn? And how can museums apply these worldviews to wider environmental education in different social contexts?

I. Indigenous Insights

This section begins the volume with insights from indigenous scholars. Two chapters

focus on the ramie plant (*Boehmeria nivea*), which has been used across Eurasia and as far away as Egypt for at least 6,000 years. Yuma Taru and Baunay Watan, Atayal scholars active in the promotion of ramie production and weaving, explore the role of this fibre in education. They show that, for much of their history, the Atayal altered their environment through swidden agriculture, growing bamboo for construction and planting alder trees to improve soil fertility. Generations ago, they ‘domesticated’ these plants as they selected them for human use. Yet, they did so in accordance with *Gaga*, the traditional Atayal moral code. Ultimately, the authors show that ramie is as important for cultural pride as it is for fibre production after more than 25 years of work, the authors created the Ramie Circular System, which combines traditional Atayal concepts of nature and culture with contemporary agro-science.

Alak Akatuang is an independent scholar of Tainan’s Siraya Nation. This is one of the plains’ indigenous groups that, widely misrepresented as having fully assimilated to Han culture, still lacks legal recognition. Through a review of historical documents and interviews with elderly informants, he reconstructs the ways in which the Siraya have used ramie for purposes such as tying objects, fishing, and hunting. With the initial assistance of Yuma Taru and Baunay Watan, he has also incorporated the concepts of ramie cultivation and crafts into local indigenous education.

These two chapters illustrate both how plants influence the development of specific human cultural practices and how living with plants can contribute to cultural memory and indigenous national rejuvenation. Interestingly, they also show the effects of the Anthropocene on indigenous culture: since the 1960s, the wide use of petrochemicals to make industrial fibres has led to the decline of ramie production.

Kumu Tapas, an independent scholar of the Sediq Nation high in the mountains of Nantou County, provides a wide ethnobotanical overview of Sediq plants. She and co-researchers from all three Sediq language groups compiled a list of over 100 plant species grouped according to 14 use categories. She provides details on how plants were used for food, clothing, ritual, building, hunting, and fishing, and explores how plants also figure prominently in Sediq oral traditions. Ethnobotany provides new insights into traditional Sediq ways of living in the Central Mountain Range, and may also provide lessons for a sustainable future with plants and animals.

II. Austronesian Perspectives

This section takes us on a voyage beginning in Taiwan, but extending further into Austronesia. Atsushi Nobayashi focuses on beads. The beads in question are made from either animal and plant materials or inorganic materials, and they are strung together with ramie fibre. Studying these beads reveals that Taiwan’s indigenous societies have never been closed systems: they have always traded with others to get what is lacking in their own ecological niches. Once the beads are strung together and put into social use, they may become important ritual items, revealing the place of individuals in local social systems. Whereas beads were once made using natural materials at hand or acquired through trade, the post-war period also saw the introduction of smaller glass beads and

even cheap plastic beads. Now, in a time when indigenous culture is being promoted, beading has emerged as a cultural industry.

Scott Simon explores birds in the National Museum of Ethnology's collection and in the lives of Austronesians. These peoples, who travelled the Pacific following the trails of birds, had rich material cultures featuring items such as tools for catching birds, feathers incorporated into objects, and representations of birds. Material complexity increased as societies became stratified and objects needed to represent a greater range of social statuses. In the Anthropocene, material culture is increasingly made from inorganic rather than organic materials, contributing to the estrangement of humans and birds. Yet, there are countervailing tendencies, such as the worship of the Yatagarasu crow in Japan, in which people seek renewed spiritual relationships with other beings.

Frédéric Laugrand and Antoine Laugrand explore local Philippine knowledge of birds using field research and workshops organised with people from the Alangan and Blaang tribes. Birds indicate future events, figure importantly in myths, and provide moral lessons for humans. These relationships are not well-captured when 'culture' is assumed to be purely human or 'ecology' is assumed to exist beyond human lives. Even the ontological turn in anthropology contributes to an objectivation of cultures, and it derives from a Western obsession with the autonomous subject. Since the Alangans and the Blaangs focus instead on relations between humans, plants, animals, and gods, the notion of cosmology is more useful than 'culture' or 'ecology' for understanding the intertwined lives of these entities.

III. Museum Experiences

Museums can play an important role in environmental education. Agilasay Pakawyan (Lin Chih-Hsing), researcher at the National Museum of Prehistory in Taitung, Taiwan, reveals the secret strategies by which his museum established itself as an award-winning leader in environmental education. At both the outdoor Peinan Site Park and the indoor space of the main museum's Kangle campus, diverse interpretative and educational activities have made visitors familiar with the richness of natural ecology and indigenous cultural heritage. Both sites provide information about interactions between humans and the environment and encourage teaching on diverse subjects, from aboriginal environmental wisdom to the cost of plastic products, which endanger the well-being of animals and destroy the atmosphere when burned.

Hsieh Shih-yuan examines visitor experience at the National Museum of Taiwan History in Tainan. In addition to the indoor exhibition spaces, the museum has used its outdoor space to plant trees of cultural or historical significance. The transplantation of old trees began in 2010 when trees in historical military dependents' villages were relocated. The trees transmit the memories of village settlers, who planted them for shade, built communities, and created new lifestyles at the intersection of Chinese and local lifeworlds. Trees are thus memory-carriers that unite the identities of people dealing with rapid change in contemporary Taiwan.

Ethnological museums also face an important challenge. Since objects in most

collections from folk societies are primarily made of organic matter, they are very susceptible to pest damage. Shingo Hidaka provides a comprehensive overview of 'integrated pest management' in the hot and humid environments of Japan and Taiwan. At National Museum of Ethnology in Osaka, systematic pest control began in 1979 with fumigation. However, new methods had to be devised following the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer and a 2005 ban on methyl bromide. The museum now applies carbon dioxide treatments on a monthly basis and is actively studying other methods. The carbon dioxide used in this process is a by-product obtained from oil refineries and chemical plants, meaning that, in addition to deterring pests, the museum is transforming one of the main causes of global warming into something useful. In the future, Minpaku would like to help other museums preserve cultural property in ways compatible with environmental protection.

IV. Landscape in Taiwan and Cross-Scape Technology

Looking across the landscapes inhabited by peoples in Taiwan and beyond, it is clear that traditional lifestyles have been irreparably transformed by the processes of colonialism and industrialisation that constitute the Anthropocene. Nonetheless, technological advancement can also be appropriated to improve indigenous people's quality of life and help them cope with the Anthropocene. These changes and potentials are the focus of this last section.

Lee Yi-tze brings together Multispecies Ethnography and Actor-Network Theory (ANT) in an innovative analysis of the changing Amis ritual landscape. A study of ritual activities throughout the year shows how Amis people construct their lives through relations with harvested plants, marine animals, birds, and pigs. However, as animal migratory patterns, urban landscapes, subsistence strategies, and government investments change, causing 'deterritorialisation' (limited indigenous access to traditional territories and resources), so do ritual practices and the contents of cultural heritage. As such, the the *Palunan* ritual, which recreates the path of ancestors' landing on Taiwan, has changed over time. Bird-hunting rituals after the harvest have given way to symbolic ceremonies. Even funeral rituals have changed due to the commercialisation of pigs. Nonetheless, these acts of cultural adaptation and invention ultimately preserve essential cultural meanings and identities.

David Blundell presents a broad survey of Taiwanese history, beginning with the first Late Palaeolithic migrations to Taiwan before it became an island beginning with the first Late Palaeolithic migrations to Taiwan some 30,000 years ago, and ending with the destruction of the Xindian First Public Cemetery heritage site in 2016 and 2018. He argues that Taiwan is a unique combination of Chinese Taoism—which encourages people to commune with nature—and Austronesian Animism. The society tries to solve massive destruction of the natural environment with ecologically friendly initiatives, such as Amis aquaculture on the East Coast and the use of ancient fish weirs and wind turbines on Penghu in the Taiwan Strait. Blundell argues that apps can be used to educate people about both heritage and environmental preservation by providing virtual reality

installations and greater access to collections.

Although economic and social transitions challenge rituals and disfigure indigenous cultures, new technologies also make it possible to improve cultural research and to involve people in environmental education. Hirofumi Teramura looks at how improvements in geographic information systems can improve archaeological and other forms of cultural research. Past mapping methods used Euclidean space to represent real geographical features. With three-dimensional mapping, it is now possible to more accurately visualise and analyse terrain. Trend surface analysis has improved the understanding of language distribution on Bougainville Island in Papua New Guinea. The use of satellite imagery and colour-coded elevation values should also make it possible to improve cultural research in Taiwan. As such, a new cross-scope viewpoint can provide a historically continuous understanding of the Taiwanese landscape.

V. Potential Contributions

Taken together, this eclectic bricolage of essays says a lot about the ecological adaptations of material culture in Taiwan and neighbouring islands. Across the region, people have long used local materials, ranging from the fibres of domesticated ramie plants to the bones of mammals and feathers of wild birds, to produce items needed for clothing, hunting and fishing, rituals, and other purposes. These items conveyed the social status of their users in different ways according to local customs. Such ways of life, except perhaps in distant communities in the Philippines, have been transformed by colonialism and the incorporation of peoples into modern economies. Entire villages of both indigenous and non-indigenous communities have been razed to make way for new forms of agriculture and urban densification. Perhaps the most dramatic change to the world since the 1960s has been the growth of the petrochemical industry and the universal use of plastics—a defining feature of the Anthropocene. Petrochemical products replaced ramie fibres to facilitate the mass production of cloth and transformed the manufacture of beads. Plastic has made life more convenient by providing people with bottled beverages and disposable utensils, but it has also endangered wildlife and polluted the space in which all living things have thrived. This is part of the challenge of the Anthropocene.

These chapters also point to a way forward. Indigenous people in Taiwan and the Philippines are rediscovering the value of their traditional ecological knowledge and sharing it with visiting anthropologists and members of their own communities through weaving workshops and other forms of public education. Ramie may not replace plastic fibres on a large scale, but education about ramie can make people aware of how our plastic-based lifestyles damage the environment. In Taiwan, some indigenous leaders hope to reconstruct human ways of living with other creatures based on ancient moral codes. Likewise, in Japan, respecting the Yatagarasu crow has become a way to reconnect with nature. In all of these cases, ecological knowledge also affirms ethnic and national identity. Cosmological diversity still exists, even on a planet increasingly covered with concrete and plastic.

Museums have become leaders in environmental education, collaborating in new ways with indigenous peoples and surrounding communities. New technologies related to geographic information systems, smartphone apps, and virtual reality installations may provide unprecedented avenues for increasingly sustainable interactions between humans and the other beings around us. Museums, as carriers of both memory and new futures, will surely play an important part in teaching humans to correct the harm we have done to other living beings in the Anthropocene.

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Notes

- 1) <https://www.minpaku.ac.jp/english/research/activity/project/ifm/2015nobayashi> (access July 15, 2020)
- 2) Material Culture in Taiwan and Neighboring Islands; <https://ifm.minpaku.ac.jp/taiwan/en/> (access July 15, 2020)

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