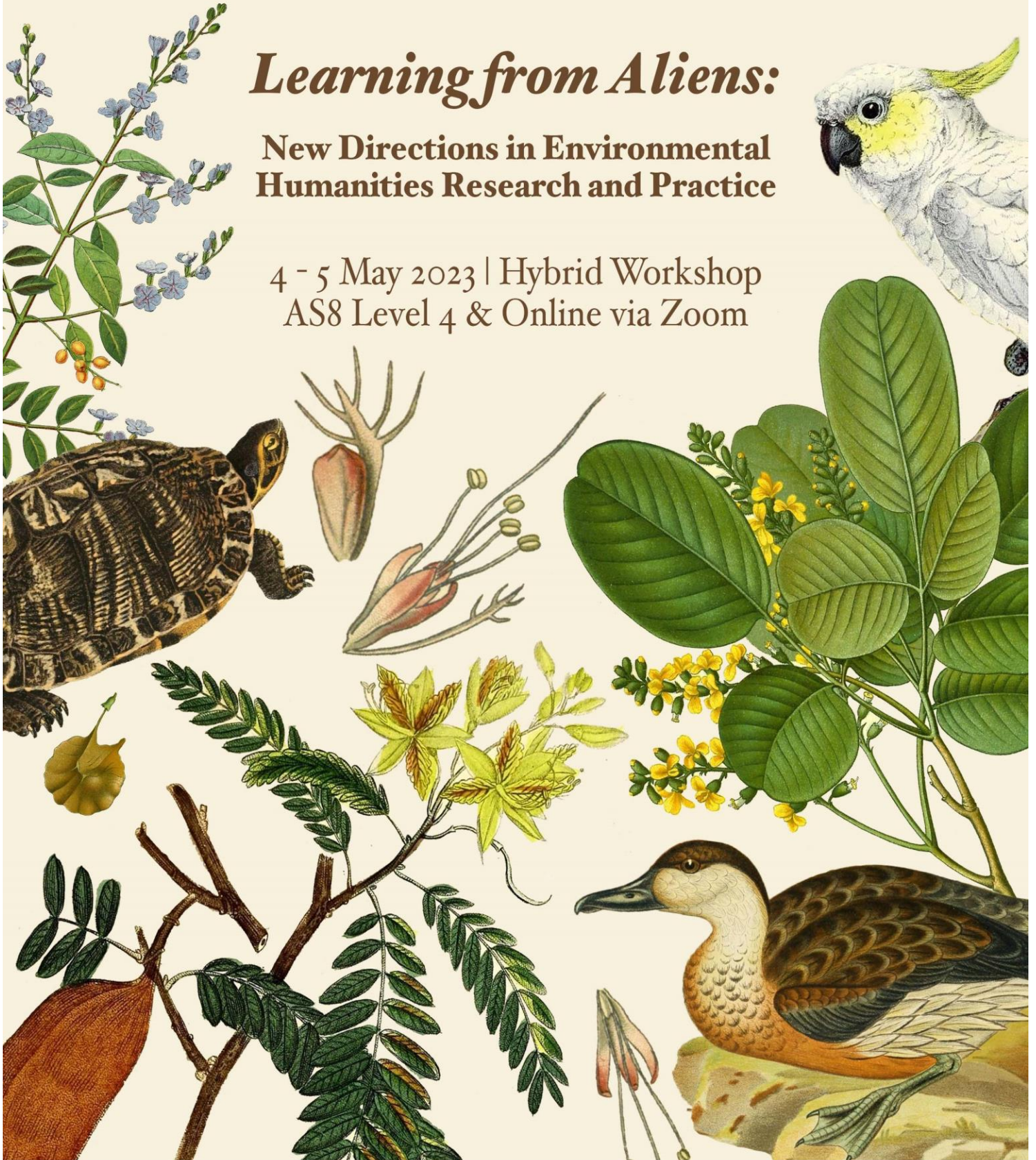


Organised by the Asia Research Institute, National University of Singapore (NUS); with support from Yale-NUS College, and funded by Singapore's Social Science Research Council (SSRTG Type A) project on "Linking the Digital Humanities to Biodiversity History in Singapore and Southeast Asia".

Learning from Aliens:

New Directions in Environmental Humanities Research and Practice

4 - 5 May 2023 | Hybrid Workshop
AS8 Level 4 & Online via Zoom



More information at: ari.nus.edu.sg/events/environmental-humanities/

This workshop is organized by the Asia Research Institute, National University of Singapore (NUS); with support from Yale-NUS College, and funded by the Singapore Social Science Research Council (SSRTG Type A) project on “Linking the Digital Humanities to Biodiversity History in Singapore and Southeast Asia”.

The world’s flora and fauna are often classified as native and non-native, indigenous and alien. These simple binaries mark biological life and, in doing so, define what belongs where and why. But when species travel, they change, transforming cultures and ecologies in their wake. While some species movements can foster explosive reproduction rates that rupture and ravage nature’s ecosystems—resulting in economic losses, biodiversity declines, and the spread of diseases—other kinds of biological flows can cultivate new ways of belonging, new food webs, and new types of cultural and ecological services. *Learning from Aliens* aims to center the travels, histories, and ecologies of non-native species to show how these kinds of stories are reshaping the work done by the environmental humanities while at the same time fostering new possibilities for interdisciplinary research. As a key deliverable of our SSRTG-funded project, “Linking the Digital Humanities to Biodiversity History in Singapore and Southeast Asia,” this workshop seeks to put into conversation diverse bodies of historical scholarship, biological knowledge production, and public outreach-focused museum and art practice. Their fruitful conversation will provide us with new insights and understandings about non-native species, the novel worlds they create, and the changes they set in motion. Building on our project’s network of biologists, historians, curators, digital botanists, and artists, among others, we intend to examine how thinking with aliens can open new pathways for researching and storying the urgency and complexity of environmental change. *Learning from Aliens* thus aims to leverage our project’s innovative scientific, digital, and historical methods as part of a broader, more critical discussion about the placeness and out-of-placeness of non-native species in today’s natural world.

WORKSHOP CONVENORS

Dr Stefan HUEBNER

Asia Research Institute, National University of Singapore

Dr Anthony D. MEDRANO

Division of Social Sciences, Yale-NUS College

PROGRAM AT-A-GLANCE

DATE	TIME (SINGAPORE TIME)	SESSION
4 May 2023 (Thursday)	09:15 – 11:00	Welcome Remarks & Panel 1
	11:30 – 13:00	Panel 2
	14:00 – 15:30	Panel 3
	16:00 – 17:30	Panel 4
5 May 2023 (Friday)	09:30 – 11:00	Panel 5
	11:30 – 13:00	Panel 6
	14:00 – 15:30	Panel 7
	16:00 – 17:45	Panel 8 & Closing Remarks

4 MAY 2023 • THURSDAY

09:15 – 09:30	WELCOME REMARKS	
<i>09:15</i>	STEFAN HUEBNER , National University of Singapore ANTHONY D. MEDRANO , Yale-NUS College	
09:30 – 11:00	PANEL 1 • ECOLOGIES	
<i>Chairperson</i>	KATHERINE ENRIGHT , Yale-NUS College	
<i>09:30</i>	JAMES JACK Waseda University	Stories Soaked in Olive Ink
<i>09:50</i>	BI WEI LOW Lingnan University	Invasive Fish Research in Tropical East Asia: Current Status and Future Directions
<i>10:10</i>	KEITA SIN MOVIN NAYANASENGERAN Singapore Birds Project	Blurred Lines: Navigating the Space between Native and Non-native
<i>10:30</i>	Questions & Answers	
11:00 – 11:30	BREAK	
11:30 – 13:00	PANEL 2 • SEASCAPES	
<i>Chairperson</i>	DARREN CHONG JINN YEO , National University of Singapore	
<i>11:30</i>	COLLIER NOGUES Chinese University of Hong Kong	Thinking Invasively Together: Challenging the “Defense Ecosystem” with Collaborative Creative Practice
<i>11:50</i>	STEFAN HUEBNER National University of Singapore	Offshore Oil Drilling and Renewable Energy Generation’s Historical Role in Marine Species Translocations: From Wooden Piers to Offshore Platforms
<i>12:10</i>	ZEEHAN JAAFAR National University of Singapore	Can Hybrid Fishes Naturalise in Coral Reef Habitats of Singapore?
<i>12:30</i>	Questions & Answers	
13:00 – 14:00	LUNCH	

14:00 – 15:30	PANEL 3 • BOUNDARIES	
<i>Chairperson</i>	SHERYL TEO , Yale-NUS College	
14:00	CYNTHIA NERI ZAYAS University of the Philippines	When the Non-native Plant Becomes Native: Ayta Local Knowledge Pre- and Post- Mt. Pinatubo Eruption
14:20	JEFFREY KWIK National University of Singapore	A Home Away from Home: The Establishment of Alien Cichlids in Singapore’s Reservoirs
14:40	YEN-LING TSAI National Yangmin Chiaotung University	1980, A Snail Odyssey: Snail Travel during Taiwan’s Great Acceleration
15:00	Questions & Answers	
15:30 – 16:00	BREAK	
16:00 – 17:30	PANEL 4 • PESTS	
<i>Chairperson</i>	JONATHAN GALKA , Harvard University	
16:00	JOSHUA NGEE CHAE GOH Singapore Management University	What Rats were These? Possible Taxonomic Identifications of Commensal Murine Rodent (Rodentia: Muridae) Sightings in Early Colonial Singapore, 1819-1845
16:20 <i>via Zoom</i>	KRIS A.G. WYCKHUYS Chrysalis Consulting AUNU RAUF Institut Pertanian Bogor	Friendly Monsters versus Aliens: Harnessing Biodiversity for Invasive Pest Control
16:40	JACK GREATREX Nanyang Technological University	“Exiguous Mollusc, Fare You Well!”: Multifarious Approaches to Pests in Colonial Malaya and Hong Kong
17:00	Questions & Answers	
17:30	END OF DAY 1	
17:45 – 19:30	WORKSHOP DINNER (For Presenters, Chairpersons and Organisers Only)	

5 MAY 2023 • FRIDAY

09:30 – 11:00	PANEL 5 • ENTANGLEMENTS	
<i>Chairperson</i>	FAIZAH ZAKARIA , National University of Singapore	
09:30	HARIPRIYA RANGAN University of Melbourne	Aesthetic Histories and Novel Ecosystems
09:50	THOM VAN DOOREN University of Sydney	The Craft of Poisoning: Learning Not to Eat Cane Toads
10:10	SHERYL TEO Yale-NUS College	Strained Mercy: A Conversation on Religious Animal Release in Contemporary Singapore
10:30	Questions & Answers	
11:00 – 11:30	BREAK	
11:30 – 13:00	PANEL 6 • HISTORIES	
<i>Chairperson</i>	MAITRII V. AUNG-THWIN , National University of Singapore	
11:30	RUEL V. PAGUNSAN University of the Philippines – Diliman	In Search of Pantropic: Cinchona, Ecological Experiments, and Philippine History
11:50	TIMOTHY P. BARNARD National University of Singapore	Preventing a Colonial Environmental Crisis: The Development of Forest Reserves in Singapore
12:10	ANTHONY D. MEDRANO Yale-NUS College	(Un)making Mindanao: Science, Development, and the Production of Freshwater Biodiversity
12:30	Questions & Answers	
13:00 – 14:00	LUNCH	
14:00 – 15:30	PANEL 7 • SCIENCES	
<i>Chairperson</i>	STEFAN HUEBNER , National University of Singapore	
14:00	EMILY O’GORMAN Macquarie University	Protecting Global Wetlands in Australia: Banteng as Feral Disruptors
14:20	JONATHAN GALKA Harvard University	Dreissenid Dreaming: Biological Invasion, Technoscience, and Mapping Scientific Entanglements with Mussels
14:40	MARIA F. MANGAHAS University of the Philippines – Diliman	The ‘Fish of Summer’ in Batanes, Philippines
15:00	Questions & Answers	
15:30 – 16:00	BREAK	

16:00 – 17:30	PANEL 8 • CULTURES	
<i>Chairperson</i>	ANTHONY D. MEDRANO , Yale-NUS College	
16:00	HUIQING YEO National University of Singapore	Control of Dengue and <i>Aedes aegypti</i> : Not All Black and White
16:20	FAN CHON HOO Visual Art Practitioner	Not All Fishes are Created Equal: Fish as Cultural and Class Symbol
16:40 <i>via Zoom</i>	MARIANNE JENNIFER DATILES University College London	A Matter of Introduction: Colonial Perceptions of the Native vs Introduced in everyday Philippine <i>Materia Medica</i> , 17-18th Centuries
17:00	Questions & Answers	
17:30 – 17:45	CLOSING REMARKS	
17:30	STEFAN HUEBNER , National University of Singapore ANTHONY D. MEDRANO , Yale-NUS College	
17:45	END OF WORKSHOP	

Stories Soaked in Olive Ink

James JACK

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Gleaning thin leaves from freshly cut branches, bright sunrays reveal soft yellow tones mingling with pale green hues flickering with hints of silver. Soaking elongated olive leaves in an upcycled vat worlds of colors slowly release into the cool water. What palette will emerge and what colors will fade in our eyes as one of the youngest species on the planet? (Kimmerer 2013) Moments from life with ink. Building upon early artworks linking materials with place including *Juglandaceae Origins* (2007), decolonizing botanical extractions in *Migration of a Cycad* (2015), revisiting lost stories for *Botanical Lessons in Idleness* (2018) and de-militarizing with *Hawthorne Resistance* (2022), I work with vegetal inks as an artist to learn from more than human species. This vegetal artistic engagement is intimately linked with the place I live now, the island of Shōdoshima (小豆島 “little bean island”), where the arrival of olive trees in the Meiji Period relied on the craftspeople steeped in centuries of *shoyu* production with the *daizu* (大豆 “large bean”), the soy bean. The offspring of intermixing large, small and more species over the past century sprouts from complex agricultural heritage, cultural transformation and artistic developments (Qu 2019) in the Seto Inland Sea region. When harm humans cause is redirected towards “unlearning imperialism” (Azoulay 2019) vegetal ancestors teach us other ways of living. Devoting oneself to touching plants (Nabhan 2022) roots our technological selves with vegetal forms of knowing. Kinships between olives and humans in motion open phyto-centric worldviews as we care for plants and they take care of us in turn too.

James Jack is an American Asian artist who engages layered histories of place to achieve positive change through community-led initiatives. His art projects have been featured at documenta fifteen, Setouchi Triennale, Honolulu Museum of Art, Busan Biennale Sea Art Festival, Centre for Contemporary Art Singapore, Donkey Mill Art Center and Tokyo Metropolitan Museum of Art. His writings cherish oral histories, islanders’ stories and artistic worldviews appearing in scholarly books including *Mono-ha: Requiem for the Sun* (2012), *Place.Labor.Capital* (2018), *American Art in Asia* (2022) and as well as journals including *ANTENNAE*, *Shima: The International Journal of Research into Island Cultures* and *ArtAsiaPacific*. He completed a doctorate in art practice at Tokyo University of the Arts, was a Crown Prince Akihito Scholar, and a Postdoctoral artist fellow at Social Art Lab, Kyushu University. He has been active in the artist collective *bacilli* since 2014, was the founding director of the Archipelagic Artist-in-Residence at Yale-NUS College and is currently Associate Professor of Intermedia Art and Science at Waseda University. For more information, please visit www.jamesjack.org.

Invasive Fish Research in Tropical East Asia: Current Status and Future Directions

Bi Wei LOW

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In recent years, introduced fishes have become extremely prominent and widespread across Tropical East Asia, being the most represented non-native animal taxa across all countries. Despite their potential far-reaching consequences on native communities and ecosystems, research on their origins, ecology, impacts, and evolution is still in its infancy, with substantial knowledge gaps existing. In this talk, I will give a brief overview of the current status of invasive fish research in Tropical East Asia and share findings from some recent studies elucidating the diversity and invasion pathways of non-native fishes in highly urbanized environments. Furthermore, I will use the highly invasive African sharptooth catfish (*Clarias gariepinus*) as a case study to demonstrate how invasions can lead to massive and irreversible ecological and genetic impacts on native species and ecosystems in the region, and highlight how an integration of traditional (e.g., field surveys, natural history specimens) and novel data-generating approaches (e.g., next-generation sequencing) is necessary to disentangle the drivers and long-term consequences of biological invasions. The challenges and future of invasive species research in Tropical East Asia will be discussed, especially in the context of rapidly-evolving physical, economic, and political landscapes within the region.

Bi Wei Low is a Singaporean ichthyologist based in Lingnan University, Hong Kong. His research interests lie broadly in the ecology and evolution of Asian freshwater fishes, biological invasions, and the conservation of imperiled freshwater ecosystems. In 2019, he obtained his PhD from the Department of Biological Sciences (DBS) at National University of Singapore, where he investigated the invasion biology of the African sharptooth catfish (*Clarias gariepinus*) in Southeast Asia. From 2019-2021, he held postdoctoral positions at DBS and the Lee Kong Chian Natural History Museum, involved in projects focusing on the potential of odonates (dragonflies and damselflies) as biological control of aquatic insect pests, and the digitisation of historically-important natural history specimens collected from Singapore. Since 2021, he has been investigating the impacts (and potential mitigation) of riverine modifications on genetic connectivity in Hong Kong fishes, as well as cryptic speciation in southern Chinese fishes. Bi Wei is an active member of the Asian Society of Ichthyologists and the IUCN Sundaic Freshwater Fish Red List Working Group, and the freshwater fishes team leader for the upcoming *Singapore Red Data Book* (3rd Edition).

Blurred Lines: Navigating the Space between Native and Non-native

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Native and non-native are two categories that seem to leave no room for confusion. However, reality is more complex. Of the 168 resident bird species in the Singapore Bird Checklist today, over 15% of them are known to have gained a foothold in Singapore through anthropogenic means. However, not all of these were directly introduced to the country. Some species expanded naturally following man-made landscape modifications, while others only gained a foothold after other species necessary for their survival had established. In this talk, we complicate the distinctions between natives and non-natives by highlighting cases that tread the blurred line between the two categories and demonstrate the need for a more nuanced take when thinking about them.

Keita Sin and **Movin Nyanasengeran** are core members of the Singapore Birds Project (SBP), an initiative that aims to educate the community through walks, booths, and online materials. The SBP website hosts detailed pages for every species of bird on the Singapore Bird Checklist, and the team uploads regular posts about various aspects of the local avifauna. In 2021, SBP launched the Singapore Bird Database, an online platform that contains details of every record of rare species in the nation. Keita is a Research Assistant/Master's student at the National University of Singapore (NUS), and Chairs the Singapore Birds Records Committee (SBRC), a sub-team of SBP that maintains the checklist and database. He has a keen interest in avian bioacoustics and his passion to study invasion biology is propelled by the fact that much of Singapore's avian soundscape is filled with non-natives, making him miss the undisturbed habitats in Southeast Asia that he doesn't have enough time to visit. Movin is a member of the SBRC and a PhD student at NUS. He is a keen birdwatcher and enjoys thinking about oddly nerdy things like why species live where they do and how they got there in the first place.

Thinking Invasively Together: Challenging the “Defense Ecosystem” with Collaborative Creative Practice

Collier NOGUES

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The historical and contemporary impact of military imperialism on Pacific ecosystems is immense, from the colonial-era introduction of invasive species to the ongoing reshaping of occupied land- and seascapes. In particular, as the United States Department of Defense has sought to establish and maintain sovereign outposts across the Pacific region, it has built a network of bilateral agreements and military installations forming what military theorists call a “defense ecosystem.” “Ecosystem,” in this usage, indicates something distinctly other than what we generally mean in the environmental humanities. Similarly, terms like “invasion,” “colonization,” “native” and “non-native” slip mutably not only across disciplinary borders but across competing worldviews and priorities when they are used by conservationists versus naval officers, historians versus military logistics planners. “Thinking Invasively Together” asks what can be learned from the ways poets and artists might put these terms to use. More precisely, how can “defense ecosystems” be interrogated, and even invaded in their turn, by networked, collaborative artmaking across sites that have been ecologically impacted by military imperialism? In this presentation, I’ll discuss a series of photographic-textual collaborations developed across a constellation of sites and stories in the Pacific, including Singapore, Japan, and Hong Kong.

Collier Noguees is Assistant Professor of Creative Writing at the Chinese University of Hong Kong. She writes at the intersection of digital and documentary poetics, with an emphasis on making connections across decolonization and demilitarization movements in the U.S. and in the Pacific. Her poetry collections include the hybrid print/interactive volume *The Ground I Stand On Is Not My Ground* (2015) and *On the Other Side, Blue* (2011). Her creative and scholarly work has been supported by fellowships from the MacDowell Colony, the Ucross Foundation, Vermont Studio Center, and the Hong Kong Research Grants Council, and her writing has appeared in *Jacket2*, *ASAP/J*, *The Volta*, *At Length*, the Academy of American Poets’ Poem-A-Day Project, and elsewhere. She is a core collaborator in the Yale-NUS project *DOKYU*, which gathers artists, writers, and historians to explore transdisciplinary approaches to archives. She also edits poetry for *Juked*.

Offshore Oil Drilling and Renewable Energy Generation's Historical Role in Marine Species Translocations: From Wooden Piers to Offshore Platforms

Stefan HUEBNER

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The rapidly proliferating number of offshore structures serving oil and gas drilling, renewable energy generation, and other industrial purposes constitute important but understudied vectors for marine species translocations. In the early twentieth century, the wooden piers of the emerging offshore oil industry began to facilitate them. Since the 1950s, offshore oil and gas platforms have translocated complex underwater ecosystems, which evolved on their submerged hulls, between previously unconnected marine regions. This paper addresses the questions how and why offshore platforms and their hull biofouling turned into new and important vectors in the process of the globalization of the offshore oil industry and the later spatial expansion of ocean industrialization through other platforms. My central point is that offshore oil and gas drilling and continuous advances in offshore platform technology resulted in a large-scale marine habitat transformation through the mass construction of new, artificial, reef-like structures made from steel or concrete. These new habitats, whose corrosion protection systems and much slower movement increased species survival compared to translocations on ship hulls, interacted with similar hard surfaces of coral reefs, other vessels including platforms, shipwrecks, and coastal structures. Globally, offshore platforms opened genuinely new spaces to marine species translocations and created equally new material conditions for them, as is shown by two case studies on the Asia-Pacific region and the Atlantic Ocean. In terms of species translocations in ecological time, the new platform vectors created what can be seen as a new epoch of biological exchanges, initially driven by the offshore oil industry's globalization process.

Stefan Huebner is a historian interested in environmental and oceanic topics and Senior Research Fellow at the Asia Research Institute in National University of Singapore. He was U.S. SSRC Transregional Research Junior Scholar Fellow at Harvard University, Fulbright Scholar also at Harvard, History and Public Policy Fellow at the Wilson Center, and Postdoctoral and Doctoral Fellow at the German Historical Institute Washington and the German Institute for Japanese Studies Tokyo. He is Principal Investigator (PI) of the Singapore Ecological History Map and Co-PI of the Singapore SSRC project on "Linking the Digital Humanities to Biodiversity History in Singapore and Southeast Asia". He is working on his second book, a history of the industrialization and urbanization of the ocean, which includes species translocations and creation of new marine habitats. His most recent articles were published in *Journal of Global History*, *Modern Asian Studies*, *Environmental History*, and *AsiaGlobal Online*.

Can Hybrid Fishes Naturalise in Coral Reef Habitats of Singapore?

Zeehan JAAFAR

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In 2015, a pair of hybrid groupers were observed in the natural coastal habitat within the western Singapore Straits, exhibiting breeding behaviours. This observation led to speculations that these hybrid specimens may be fecund or that they are naturalizing in natural seascapes of Singapore. Varying species of groupers are purposefully hybridised to obtain offspring with desirable traits. The hybrid specimens in this instance are the TGGG Hybrid Groupers, typically cultured in open sea cages and *kelongs* in Singapore; but individuals escape from these facilities or are introduced to wild spaces through mercy releases. We launched a study to understand if escapee hybrid groupers are using natural coastal habitats. We employed several methods to learn the distribution of these hybrid groupers within the Singapore and Johor Straits— assessment of catch reports from 2013-2020, capture surveys, Baited Remote Underwater Video Systems, and in-situ visual surveys on SCUBA. Our data identifies the Eastern Johor Strait as a hotspot for these hybrid groupers, but they are not naturalised in coral reef areas. Breeding between hybrid animals is unlikely, and we surmise that spawning behaviour observed in hybrid groupers may not result in actual spawning, or viable offspring. Present populations within natural areas are likely to comprise escaped individuals that may enter coral reef habitats but are unlikely to significantly compete for resources with native grouper species.

Zeehan Jaafar is a marine biologist at the National University of Singapore with research interests in the ecology of marine fishes, and conservation of their habitats. She has led and participated in many international and regional expeditions to enhance understanding on the diversity and distribution patterns of fish fauna. She is the author of two books, *Fishes Out of Water: Biology and Ecology of Mudskippers* and *Endangered Forested Wetlands of Sundaland: Ecology, Connectivity, Conservation* and the lead editor of *The Singapore Blue Plan 2018*. A keen diver, she enjoys sharing her passion for Singapore's marine areas through public engagement and education.

When the Non-native Plant Becomes Native: Ayta Local Knowledge Pre- and Post- Mt. Pinatubo Eruption

Cynthia Neri ZAYAS

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Women of Sama d'laut of Sitangkai use homemade natural cosmetics such as sunscreen and astringent. The leaves of *kahawati* popularly known as Madre de cacao in the Philippines, or *Gliricidia sepium* (Jacq.) Walp. (Fabaceae) is useful to Sama women whose lives revolve around the sea. *Kakawati* leaves and softened rice grains are pounded together to produce a paste. The paste spreads like a mask. Meanwhile, the Ayta of Pinatubo uses the *kakawati* bark for cough and its leaves for skin disease. *Kakawati* (< Nahuatl *cacahuati*) is a loan word from Mexico. Though native to the Americas, it spread all the way to the southern tip of the Philippine archipelago. This was carried out during the galleon trade between the Philippines and Mexico (1565-1815). The Ayta language indicates the nativeness of some plant species by adding the adjective *lalê* 'wild', e.g. *halamang lalê* 'wild plants', *pinatubo* 'raised', *lamon pinatubo* 'pinatubo grass, etc. while non-endemic species are named after the place of origin, e.g. *kapampangang* 'a sweet potato from the province of Pampanga'. What exactly happens when species move with people who are persistent users of these plants or when their environment is devastated by volcanic eruptions? More than 70 years (Fox, 1952) ago or 20 years after Mt. Pinatubo's eruption (Ragrario, 2003), more than one-half of food and medicinal plant knowledge was lost. My presentation is an assessment of Ayta's local knowledge.

Cynthia Neri Zayas is formerly Full Professor and Director of the Center of International Studies at the University of the Philippines and is currently Senior Lecturer of the said institution. Her ethnographic fieldwork is divided between the Philippines and Japan. Apart from fishing communities, and cultures of disasters, she has written on free women divers or ama, maritime sojourners, heritage and fish weirs, and indigenous/local knowledge. From 2016-2019 Zayas was appointed Coordinating Lead Author for Chapter 2.3. Status and Trends – Nature's Contributions to People (NCP) <https://zenodo.org/record/5519476#.Y-2MUGlBw2w>, by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) in connection with the assessments of knowledge on biodiversity and ecosystem program and their interlinkages at the global level (<https://doi.org/105281/zenodo.3553579>). Her latest publications for the year 2022 include "The persistence of bubo, fish trap in Philippine artisanal fishery" in *Bulletin of National Museum of Ethnology* and "Natural Hazards, Risks, and Peoples in the Pacific World" in *The Cambridge History of the Pacific Ocean, Volume 1 – The Pacific Ocean to 1800*.

A Home Away from Home: The Establishment of Alien Cichlids in Singapore's Reservoirs

Jeffrey KWIK

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To understand the diversity and distribution patterns of non-native fishes in Singapore's reservoirs, we investigated the species richness and abundances of fish communities in these lentic habitats. Our surveys revealed that non-native fishes are dominant (43 out of 55 species, 79%) in these man-made habitats. Amongst these non-native fishes, the largest family included the cichlids (14 species from different origins), and contributed to the majority of fish abundances (62.6%) across all the reservoirs; of which, the eartheater, *Geophagus altifrons*, the green chromide, *Etilplus suratensis*, and the Orinoco peacock bass, *Cichla orinocensis*, were the most abundant cichlid species. Based on ordination analyses, we found that the distribution and abundances of cichlids appeared to be related to environmental parameters such as salinity and nutrients, and that species richness and abundances of cichlids differed between coastal and inland reservoirs. While we are unable to determine the source and timing of the introductions of these cichlids, we are at least confident that many of the cichlids have already established themselves in many of these reservoirs. We postulate (and discuss during this presentation) that the establishment success and the co-existence of this large non-native group has come about through their ability to adapt to the conditions within each unique reservoir, and this is related to the life history strategies, feeding and behavioural patterns that these different cichlid species display.

Jeffrey Kwik is currently Senior Research Fellow in the Freshwater and Invasion Biology lab of the Department of Biological Sciences at the National University of Singapore. Dr Kwik is a fish biologist and ecologist with more than 30 years of experience studying fishes in tropical, sub-tropical, and temperate ecosystems. He has researched fishes in both freshwater and marine habitats in Singapore as well as countries such as Fiji, Australia, Papua New Guinea and Indonesia, and Dr Kwik's specific areas of expertise include trophic and community ecology, growth and development, reproductive biology and sensory biology of fishes. Since 2005, he has been closely involved in multiple consultancies looking at the aquatic diversity in Singapore's waters including PUB-commissioned projects studying the fishes in Singapore's reservoirs.

1980, A Snail Odyssey: Snail Travel during Taiwan's Great Acceleration

Yen-ling TSAI

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Native to South America's Río Paraná river basin, *Pomacea canaliculata* (English: golden apple snail, Chinese: "Fortune Longevity Snail," Taiwanese: "Golden Treasure Snail") were introduced to Asia in the late 1970s. By the end of the 1980s, their presence was seen throughout tropical and subtropical Asia and Australia. The snail's preference for consuming the tender shoots of plants has resulted in catastrophic agricultural damage and losses for crops including rice and taro which are widely grown in Asia. It is commonly believed that the snails are highly invasive in Asia due to the combined reason of 1) lacking natural enemies in Asia and 2) its ability to spread through irrigation canals, natural water distribution pathways, and during flooding events. My research, on the other hand, refuses the nominal and binary analytical framework of the invader versus the invaded, and the erasure of historical specificity and human agency involved in preparing the invaded landscape in the first place. Historicizing the introduction of golden apple snails to Taiwan through archival research and interviewing snail importers, breeders, farmers, scientists, and policy-makers, my presentation wishes to re-conceptualize the "invasive encounter" between the golden apple snails and Taiwan as a mutually-constitutive process of "domestication gone wild," and an unintended consequence of Taiwan's postwar Great Acceleration.

Yen-ling Tsai is a cultural anthropologist teaching multispecies ethnography, feminist pedagogy and Southeast Asian studies at the National Yangmin Chiaotung University. She also runs a women's farm co-op and grows organic rice in her hometown in northeast Taiwan. Her dissertation research project focuses on social intimacies between Chinese Indonesians in Medan, Indonesia and their non-Chinese Indonesian associates, by looking at the minutiae of everyday interactions in which ethnoracial distinctions emerge and co-constitute with class and gender. Yen-ling's second research program explores the multispecies dynamics in organic paddy fields in Taiwan, examining how histories and ongoing realities of settler colonialism and capitalist expansion shape divergent practices of cultivation and care. Her engaged research suggests that being attentive to multispecies relations and care offers hope for a politics that may lead to new and richer possibilities for earthly co-existence. Yen-ling's latest research project focuses on the contingent human/non-human collaborations in forming the "golden apple snails diaspora" in Asia, first from Argentina to South Taiwan, and then from Taiwan to Japan and the Philippines. Overall, Yen-ling's work has been about seeing differences anew, pushing back against easy binaries such as "Chinese/non-Chinese", "foreign/natives", "human/non-human". Her academic writings have appeared in journals such as *Indonesia*, *Cultural Anthropology*, *Router: A Journal of Cultural Studies*, and *Current Anthropology*.

What Rats were These?
Possible Taxonomic Identifications of Commensal Murine Rodent
(Rodentia: Muridae) Sightings in Early Colonial Singapore, 1819-1845

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The first decades following the foundation of the British trading settlement in 1819 constitute a pivotal period which saw the introduction and establishment of commensal murine rodents (order Rodentia: family Muridae) as 'pest' species in the island's urban environment. The ecology of commensal murine rodents during this period, however, is still very much poorly understood. Official scientific interest in commensal murine rodents only started to pick up during the early 1900s when successive Municipal extermination campaigns made large quantities of rat specimens available for research purposes. This study represents a preliminary attempt to address the aforementioned gap in the literature. By paying close attention to anecdotal rodent sightings contained within documentary sources like administrative correspondence, it reconstructs as far as interpretatively possible the taxonomic identification of commensal murine rodents in Singapore during the early colonial period, 1819-1845.

Joshua Ngee Chae Goh is a research assistant at Singapore Management University's College of Integrative Studies. He is an interdisciplinary urban scholar who works on the environmental histories of Singapore, Malaysia, and Hong Kong.

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Friendly Monsters versus Aliens: Harnessing Biodiversity for Invasive Pest Control

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Across the globe, swelling numbers of invasive species inflict major socio-economic impacts, drive biodiversity loss, undermine environmental integrity and compromise human health. Here, we show how (insect) biodiversity can be harnessed to provide more sustainable forms of invasive species management and non-chemical pest control in agricultural settings. Drawing on a case study from subtropical Asia, we illustrate how scientifically-guided biological control can provide durable control of alien herbivores over a continental scale. In 2008, the mealybug *Phenacoccus manihoti* (Homoptera: Pseudococcidae) invaded Southeast Asia, where it caused major losses in cassava and triggered 2- to 3-fold surges in the price of cassava starch – a globally-traded commodity. To mitigate *P. manihoti* outbreaks, different Asian countries either promoted a prophylactic usage of systemic insecticides or introduced the monophagous parasitoid *Anagyrus lopezi* (Hymenoptera: Encyrtidae). Through observational studies, region-wide population surveys and manipulative assays, we demonstrate how *A. lopezi* established in multiple Asian countries and suppresses *P. manihoti* populations below economic levels. We equally show how mealybug biological control has stabilized the inter-country trade of cassava-derived commodities and reduced price volatility in global futures markets. Lastly, we illuminate how biological control helped to slow the expansion of the agricultural frontier, easing pressures on tropical forests. Our research provides an eye-opening account of how insect biodiversity underpins the overall resilience of tropical agro-ecosystems and offers powerful solutions for (invasive) pest issues. Our work underlines the immense potential of biodiversity-driven tactics to safeguard agri-food production and to deliver multiple (often un-anticipated) societal benefits over extensive spatio-temporal scales.

Kris A.G. Wyckhuys is a Belgian bio-science engineer and entomologist (PhD, 2005, Purdue). He presently runs a one-man consulting enterprise Chrysalis Consulting, through which he provides tailored support to biodiversity-friendly agriculture and biological control in Asia and Latin America. He is also Honorary Associate Professor at the University of Queensland (Australia), Guest Professor at China Academy of Agricultural Sciences CAAS, and Jinshan Scholar at Fujian Agricultural and Forestry University (China). Kris was previously employed as entomologist at the International Center of Tropical Agriculture (CIAT-CGIAR) covering tropical fruits in Latin America (2010-12) and cassava in Southeast Asia (2013-17). Over the past 25 years, he has examined the implementation of biological control under Integrated Pest Management (IPM) schemes in a range of cropping systems e.g., smallholder maize in Central America, cotton in China, horticultural crops in Colombia. Kris has approximately 140 peer-reviewed publications on agro-ecology, biological control and on-farm biodiversity conservation. Some of his earlier work e.g., on the global insect decline or socio-economic benefits of biological control has been extensively covered by the international press.

Aunu Rauf is a retired professor of entomology at the Bogor Agricultural University, located in Bogor-Indonesia. He used to teach the subject of Insect Ecology, Integrated Pest Management, and Economic Entomology at his university. He earned his PhD degree from the Department of Entomology, University of Wisconsin-Madison (USA) in 1983. Over the past 40 year, he has worked on the integrated pest management (IPM) for vegetable crops. In the more recent years, his research focused on the invasive insect pests and biological control. In collaboration with Dr Amporn Winotai (DOA-Thailand), Dr JW Ketelaar (FAO), and Dr Kris Wyckhuys (CIAT), he introduced parasitoid *Anagyrus lopezi* from Thailand in 2014 to control the invasive pest, cassava mealybug *Phenacoccus manihoti*.

“Exiguous Mollusc, Fare You Well!”: Multifarious Approaches to Pests in Colonial Malaya and Hong Kong

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The five words which open my title represent perhaps the emotional height of Gilbert E. Brooke’s 1925 poem, “To *Murex trunculus*.” Published in the *Singapore Naturalist*, this poem by Brooke, Singapore’s Chief Health Officer and head of the League Epidemiological Bureau, is an ode to a species of mollusc and a lament of its capacity to feel “unhuman pain”.

Brooke’s work duties involved him in mass rat slaughter to prevent the intrusion of bubonic plague into Singapore and other port cities in Asia. But his writings elsewhere reveal a sensitive naturalist’s appreciation of molluscan nociception, the admirable “pluck” of rats, and even the capacity of plague fleas for romantic love.

If Brooke’s concerns were eccentric, they help reveal the subject of this talk — that alongside exterminatory ambitions, revulsion, and quasi-nativist horror of the intrusive pest, so too did multifarious perspectives towards “pests” and what would now be known as “invasive species” exist among colonial figures in Malaya and Hong Kong, between the 1890s and the 1960s.

In this presentation, I shall elucidate some of these multifarious approaches to the “pest” — showing how alongside revulsion, the pest could be approached with fascination, affection, as a potential ally in schemes of biological control, and even as an indexical sign of devastating changes wrought by empire on ecologies and landscapes.

Jack Greatrex is Postdoctoral Research Fellow at Nanyang Technological University, Singapore. He completed a PhD on the bodily, discursive, economic, and infrastructural histories of ‘pests’ in colonial Hong Kong and Malaya, undertaken at the University of Hong Kong. Before this, he read the World History MPhil and the undergraduate history tripos at the University of Cambridge. His research is located at the conjunctions of colonial, environmental, medical, and multi-species histories in Asia and the South Pacific.

Aesthetic Histories and Novel Ecosystems

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Ecology and aesthetics are as inseparable as *yin* and *yang*. Plants are an integral part and production of our habitual, everyday engagement with different kinds of ecologies. Their presence, absence, or variety reveal how different human impulses and activities of *cultivation*, in all the nuanced meanings and senses of the word, have remade diverse living worlds. The aesthetic histories of plants reflect the persistent human neuroses with the cultivation of nature, society, and the individual. Plants that are deemed alien invasives are particularly interesting because they reveal the changing material desires, urges, excesses, and uncertainties produced by these preoccupations and the turnover of fashions and trends that define our lives and worlds.

Ecologists have defined novel ecosystems as unique assemblages of biota and environmental conditions that have emerged through intentional or unintentional human agency. They are considered to have crossed ecological thresholds which prevents restoration to any previous state and have the capacity to sustain themselves. This paper explores the dialectics between aesthetic histories and novel ecosystems through the commodity economy of gardening and evolving urban landscapes. It focuses on *Lantana camara*, a perennial shrub which is regarded as both ornamental and an alien invasive species that transforms ecosystems.

Haripriya (Priya) Rangan began her academic life as a student of architecture and wandered through a number of disciplines, from urban and regional planning to her current preoccupation with biocultural geography, political ecology and the environmental histories of the Indian Ocean World. Her doctoral research examined the rise of the Chipko movement, India's most famous grassroots environmental struggle which challenged the government's forestry practices in the Indian Himalayas. Later, while researching the political ecology of the traditional medicine plant trade in South Africa, Priya's curiosity was aroused by the diverse ways in which introduced tree species from India and Australia were being incorporated into indigenous pharmacopeia and everyday livelihoods. This led her to new interdisciplinary research collaborations centred on the historical and political ecological contexts of transfers of tree species between India, South Africa and northern Australia. One of these migrant trees was the baobab, a magnificent biocultural presence and repository of many unwritten histories across the diverse landscapes of the Indian Ocean World. Her current collaborative research project funded by the Social Science Research Council (SSRC-USA) focuses on the long-term agroecological histories of small tropical island complexes in the northeastern and southwestern Indian Ocean. Priya is Principal Fellow at the School of Geography, Earth and Atmospheric Sciences, University of Melbourne. She received her doctoral degree from the University of California, Los Angeles, and has taught at the University of California, Berkeley, University of Kentucky, RMIT University and Monash University.

The Craft of Poisoning: Learning Not to Eat Cane Toads

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Since their introduction in 1935, cane toads have been making their way across the top half of the Australian continent. As they've moved, they have left a wave of death in their wake, animals poisoned by the unfamiliar toxins that toad's carry. All efforts to eradicate toads, or even slow their advance, have failed (while also often failing to meet basic standards for the humane treatment of animals). In recent years, however, a new set of approaches to coexistence with cane toads has begun to emerge. These approaches centre on large scale efforts to teach native species not to eat toads through a 'conditioned taste aversion' that is produced with the use of nauseating toxins. This paper explores the history and ethics of these multispecies pedagogical experiments. It asks how the various toxic substances that are deployed by both toads and scientists open up new possibilities for learning, for becoming differently together, for reshaping ecosystems and shared lives, while also carrying with them significant, and often mortal, dangers.

Thom van Dooren is Deputy Director at the Sydney Environment Institute and Associate Professor in the School of Humanities at the University of Sydney. His research and writing focus on some of the many philosophical, ethical, cultural, and political issues that arise in the context of species extinctions and human entanglements with threatened species and places. He is the author of *A World in a Shell: Snail Stories for a Time of Extinctions* (MIT 2022), *The Wake of Crows: Living and Dying in Shared Worlds* (Columbia UP 2019), and *Flight Ways: Life and Loss at the Edge of Extinction* (Columbia UP 2014). For more information, please visit www.thomvandooren.org.

Strained Mercy: A Conversation on Religious Animal Release in Contemporary Singapore

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Religious animal release, which entails the release of captive and commercially-farmed animals, has been at the centre of public debate in recent decades in Singapore. Most notably, practitioners have been criticised for releasing non-native species—such as the Java sparrow, American bullfrog, and red-eared slider—into local habitats. The scientific community has, over the years, expressed growing concern about the potential damage caused to local habitats and biodiversity. Since outlawing animal release in the early 2000s, the state has also established itself as an important player in the practice’s regulation. The response of local Buddhist practitioners has varied; while some have disavowed the practice entirely, others nonetheless attempt to continue practicing animal release in step with shifting environmental, ethical, and legal discourses.

In this sharing, I explore these different perspectives on the practice of religious animal release, and attempt to draw them into conversation with one another. I suggest ways in which these discourses reveal particular anxieties about the issues of land use change, community engagement, and biodiversity conservation in contemporary Singapore. Most importantly, this presentation sketches out nascent possibilities for meaningful engagement between different stakeholders, highlighting the potential of these collaborations.

Sheryl Teo is Research Assistant with the SSRTG-funded project, “Linking the Digital Humanities to Biodiversity History in Singapore and Southeast Asia”, and has been involved with the project since 2020. She currently coordinates digitisation and public education efforts for the project. Having graduated from Yale-NUS College with a Bachelor of Arts (Honours) in Anthropology, her research interests include the anthropology of religion, the role of the arts in Southeast Asian communities, as well as cross-border social, political, and historical flows in the region.

In Search of Pantropic: Cinchona, Ecological Experiments, and Philippine History

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In 1912, the Philippine Bureau of Forestry started experimenting on various variety of trees for reforestation and other purposes. The need to immediately rehabilitate denuded and barren areas steered the Bureau to consider foreign species known for their rapid growth and maturity. The experiments continued in the postwar era as greening projects gained more congressional funding as well as larger public scrutiny. With more foreign trees subjected to investigations, the goal was to discover what the Bureau referred as “pantropic” trees or introduced tropical species that could easily adapt to Philippine soil and climate, and ultimately be cultivated abundantly in different areas of the archipelago.

Focusing on cinchona, a plant native in the mountains of South America, this paper historizes state-sponsored experiments on introduced trees. The case of cinchona presented an interesting case: it was one of the species in 1912 to be transplanted in the country’s Forest Reserves for “trial plantings”; and in the period after 1946, it became a subject of Cold War-funded investigations to examine its viability as a national reforestation crop. Focusing on the cinchona experiments in Makiling Forest Reserve and in Bukidnon Plantation, the paper identifies the differing results of the national project in the two locations, and presents how scientists and foresters of the time assessed the outcomes in relation to the pantropic question. The paper intends to shed some insights about the historical contingencies that shaped the “national” mobility and applicability of introduced species in the archipelago.

Ruel V. Pagunsan is Associate Professor at the Department of History, University of the Philippines – Diliman. He obtained his PhD in History from the National University of Singapore. His research interests focus on the nationalization of ecological spaces and the environmental history of nation-building in the Philippines.

Preventing a Colonial Environmental Crisis: The Development of Forest Reserves in Singapore

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Forest management in Singapore began in 1883 to alleviate an environmental crisis triggered by a 95 per cent deforestation after a few decades of colonial rule. In an attempt to make the island a livable, and still productive, ecological space, the government created forest reserves, in which botanists planted a mix of native and non-native species in hope that a viable ecosystem could be created. While this area, mainly in the center of the island, functioned as model for the disparate policies of conservation and preservation prevalent throughout the imperial world during the period, it also reveals how a mixture of local and alien flora came to dominate the biological profile of the modern nation-state.

Timothy P. Barnard is Associate Professor in the Department of History at the National University of Singapore, where he specializes in the environmental and cultural history of island Southeast Asia. His most recent books are *Nature's Colony* (2016) and *Imperial Creatures* (2019).

(Un)making Mindanao: Science, Development, and the Production of Freshwater Biodiversity

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The world's organisms are often classified as native and non-native, indigenous and alien. These simple binaries mark biological life and, in doing so, define what belongs where and why. But when species travel, they change, transforming cultures and ecologies along the way. While some species introductions can cultivate new livelihoods, new food webs, and new types of ecological services, other kinds of biological flows can foster explosive reproduction rates that rupture and ravage nature's ecosystems—resulting in cultural, economic, and biodiversity losses.

In the case of Philippine freshwaters, it was the pairing of science and development that championed an age of species movements in the wake of 1946. Inspired by the possibilities of the postwar moment, this new biological age made sense politically. It was reasoned within the urgencies of economic progress and food security. In practice, it meant that indigenous fishes were introduced to alien habitats while non-native types were stocked within native freshwaters. From Luzon to Mindanao, and vice-versa, indigenous fishes from one island were planted in another to feed and bolster the country's protein supply. This paper explores how science and development coalesced to boost the production of Lake Lanao's fisheries and, in the process, unmake Mindanao's ichthyofauna. In particular, it charts the losses that followed the release of two indigenous but introduced gobies vernacularly known as *kadurog* (*Glossogobius giurus*) and *katolong* (*Hypseleotris agilis*) and the ways in which these non-local species contributed to the extinction of Lake Lanao's endemic cyprinids and the Maranao worlds they embodied.

Anthony D. Medrano is the National University of Singapore (NUS) Presidential Young Professor of Environmental Studies at Yale-NUS College. He also holds appointments in the Department of History at the National University of Singapore, the Asia Research Institute, and the Lee Kong Chian Natural History Museum. His teaching and scholarship look at histories of biodiversity research in Singapore and Southeast Asia. He is Principal Investigator of the Social Science Research Thematic Grant titled "Linking the Digital Humanities to Biodiversity History in Singapore and Southeast Asia". Medrano is completing his first book, *The Edible Ocean: Science, Industry, and the Rise of Urban Southeast Asia*, which is under contract with Yale University Press.

Protecting Global Wetlands in Australia: Banteng as Feral Disruptors

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In January 1849, 20 banteng disembarked from a boat sent by a merchant in Bali at the European settlement of Victoria on Cobourg Peninsula in the topical north of the Northern Territory, Australia. This paper takes up the story of the descendants of these banteng at a time when Cobourg Peninsula became the first ever Ramsar-listed wetland of international importance in 1974, to today. It examines changing ideas by scientists about how Cobourg Peninsula functioned and should function under conservation programs driven by both local protected area imperatives and international obligations under the Ramsar Convention. Scientists shifting use of concepts such as ecology, habitat, landscape, ecosystems, and enduring use of invasion biology, reveal changing scientific ideas as well as their attempts to grasp the layered histories and dynamic changes at the site. Banteng did not fit easily into these changing understandings or layered histories. They were a disruptive feral presence. Scientists were concerned of their environmental effects but they also disrupted expectations about their 'feral' behaviour. Banteng needed to be incorporated into different understandings and uses of the site. In those efforts to incorporate or exclude we can see a lot about those changing understandings of how the site did and should function.

Emily O'Gorman is an Australian Research Council Future Fellow and Associate Professor at Macquarie University, Sydney. Her research is situated within environmental history and the interdisciplinary environmental humanities, and is primarily concerned with contested knowledges within broader cultural framings of authority, expertise, and landscapes. She is the author of *Flood Country: An Environmental History of the Murray-Darling Basin* (2012) and *Wetlands in a Dry Land: More-than-human Histories of Australia's Murray-Darling Basin* (University of Washington Press, 2021). She is currently the convenor of the Australian and Aotearoa New Zealand Environmental History Network. For more information, please visit www.emilyogorman.net.

Dreissenid Dreaming: Biological Invasion, Technoscience, and Mapping Scientific Entanglements with Mussels

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Zebra mussels (*Dreissena spp.*) are small, gregarious bivalve mollusks that have, in the past few decades, become discursive icons of biological invasion. Although biological invasion has been problematized across the environmental humanities, zebra mussels have received little critical attention. Due to the renewal of nativist politics combined with enhanced species detection technologies, zebra mussels are increasingly engaged with and reconfigured. Drawing from methods in the history of science and critical science studies, I bring these controversial dreissenid mussels to the fore. In the process I introduce a hybridized, more-than-human figure: the human-mussel. Following Haraway and others, the figure, interaction, and space of the human-mussel marks an at-times awkward becoming-together of animals and (some) humans not only in normatively patchy socio-political environments, but also in bio-chemical environments full of unknown encounters. I track the human-mussel across four instances of technoscientific engagement with zebra mussels since 1980, in the process investigating accounts of zebra mussels as potential pathogen bio-accumulators, as biomonitoring sentinel technologies, as tissue donors to national biobanking practices, and finally as dangerous organisms to be targeted and eliminated with biologically derived molluscicides. As bio-accumulators and biomonitors, mussels augment human sensation of chemical environments and, in the process, suffuse human-mussel relations with varied hopes and anxieties. In biobanks, meanwhile, the human-mussel co-constitutes history. In contrast, makers of a biocide called Zequanox capitalize on multispecies intimacies to advertise an aspirational future free of dreissenids. Remade through these various frameworks, dreissenids join other organisms in provoking a broad vision of biological invasion by tracking shifting expectations of multispecies and other more-than-human relations.

Jonathan Galka is a doctoral candidate in the History of Science Department at Harvard University. In 2022-2023, he is a visiting scholar in the Department of History at Nanyang Technological University (NTU) and with the NTU Centre for Contemporary Art on its Climate Change and Cultural Loss project. His dissertation examines the 20th-century identification of deep-sea manganese nodules as scientific, political, and economic resources. It uses historical and ethnographic methods to query how the construction of nodules as a mineral resource frontier imbricated the biological and geological sciences with Cold War and postcolonial law and politics. Jonathan is continuing this work in Singapore, as deep-sea nodules take on renewed significance in the green energy transition. Beyond deep-sea minerals, Jonathan is interested in the history of biology, especially of exogenous species in and as technologies. A particular focus is on the history of mollusks and malacology. His work on this topic has been shared in venues including *Island Studies Journal* and *Journal of the History of Biology*. Prior to beginning his doctoral research, he completed a BS in the history of science, and in ecology and evolutionary biology at Yale University, before completing a Fulbright research grant on pre-exposure prophylaxis for HIV among marginalized Malaysian communities.

The 'Fish of Summer' in Batanes, Philippines

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This paper concerns a paired migratory species: flying fish (family Exocoetidae) and dorado (or dolphinfish – *Coryphaena hippurus*) which are typically seen in Batanes waters in the summer months of the year, especially from March to May. They are the 'fish of summer' (among nu rayon) and the focus of attention by specialist fishers (the mataw), dedicated to testing their luck (sagal) in this limited period, in certain parts of Batan Island. The same fishers are also prohibited during this ritually demarcated season to attempt capture of so-called 'real fish' (uyod a among), typically demersals, the 'native' species in the traditional fishing grounds. How the migratory species are 'good to think with' in terms of an image of society and leadership should be noted and also related to the manner in which behavior of the fish that came from far away places is attended to on a daily basis, and from one year to another. An interdisciplinary 'citizen science' project that would explore the possibilities of building on ethnographic categories and narratives to keep tabs on visitor species and changing ecologies, is proposed.

Maria F. Mangahas is Professor of Anthropology at the Department of Anthropology in University of the Philippines – Diliman. She completed her PhD in Social Anthropology in the University of Cambridge in 2001 with field research on coastal and small-scale fishing communities in Batanes and Samal Island in the Philippines. She has also investigated the phenomenon of digitized 'scandals' and media piracy, and recently has been looking into the history of Philippine anthropology. She is currently Editor of *Aghamtao*, the official journal of the Ugnayang Pang-Aghamtao, Inc./Anthropological Association of the Philippines.

Control of Dengue and *Aedes aegypti*: Not All Black and White

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The yellow fever mosquito (*Aedes aegypti*) originated in Africa, but has since spread worldwide through ships used for European exploration and colonization. The introduction of *Ae. aegypti* into Singapore was recorded as early as 1908. Unbeknownst to everyone at the time, it is also a competent vector dengue fever (DF) virus, which has a zoonotic origin from Southeast Asia. Reports of dengue haemorrhagic fever (DHF), a new form urban disease with more severe symptoms, first surfaced from neighbouring countries in 1953. It was not until a dengue outbreak in 1960 however, that people started to switch their attention from malaria to dengue. A governmental vector control research department, headed by Dr. Chan Kai Lok, was set up. He took an integrative vector control approach involving systematic reforms and advocating for community cooperation (“gotong royong”) as well as educating youths to garner efforts in reducing mosquito breeding sites. While these efforts brought the *Ae. aegypti* population down drastically, dengue outbreaks still occur on a regular basis in Singapore. Today, novel technologies have been developed to control *Ae. aegypti* populations, including the use of reproductive bacteria (*Wolbachia*) to induce sterile males for release into the wild. While such targeted measure is very effective, it may bring about unintended consequences such as freeing up an ecological niche for other local *Aedes* species, and increasing outbreaks as a result of low herd immunity. It is a reminder that we are very much part of the ecosystem and are still subjected to its evolutionary consequences.

Huiqing Yeo is a final-year PhD candidate at the Department of Biological Sciences in National University of Singapore. Prior to this, she worked in the research arm of the National Environment Agency – Environmental Health Institute (EHI), a government agency involved in vector control and mosquito-borne disease surveillance. There, Huiqing had the chance to collaborate with the leading mosquito expert in Singapore, Mrs Lam-Phua Sai Gek, and renowned mosquito entomologist, Dr Bruce Harrison, to develop the first consolidated checklist of mosquitoes in Singapore. Huiqing also picked up identification and fieldwork skills, and was involved in the research employing the endosymbiont *Wolbachia* as a novel vector control strategy to suppress the populations of the main dengue vector *Aedes aegypti* in Singapore. Recognizing that not all mosquitoes are involved in human disease transmission and that many species can be important ecological indicators, Huiqing’s PhD work involves the use of genomic techniques to understand how mosquitoes respond to a changing world through the lens of evolution.

Not All Fishes Are Created Equal: Fish as Cultural and Class Symbol

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Growing up in Pulau Ketam, a fishing village off the coast of Klang (Selangor, Malaysia), fish has been a recurring motif in my visual art practice. One of my projects studied how the tilapia fish was smuggled into Taiwan by two Taiwanese soldiers from Singapore in 1946 and subsequently became the national sea bream of Taiwan today. "The World is Your Restaurant" project framed the banquet service as a site for convivial social interactions while also serving as a stage for some to declare their social status and for others to perform their class aspirations. In a banquet, fish is often the centrepiece, and the choice reveals the class distinctions that operate under the veneer of taste as much as man's domineering relationship with nature. And the recent project "Let them eat salmon" looked at the cosmetic processing of farmed salmon and the social status of salmon consumption as a signifier of class and wealth in Southeast Asia. During this presentation, I will share and reflect on my fish-related projects through the axis of cultural representation and class association, commercial branding exercise and the process of naturalisation of foreign species.

Fan Chon Hoo is a Malaysian visual art practitioner based in Penang; he graduated with a BA in Photography at the University of Arts London – London College of Communication in 2010. In 2019, Fan Chon participated in the 3rd edition of the Makassar Biennale. The following year he co-curated "Bayangnya itu Timbul Tenggelam - Photographic Cultures in Malaysia" at the Ilham Gallery, Kuala Lumpur. His solo exhibitions include "Let them eat salmon" (Singapore, 2023) and "The World is Your Restaurant" (Kuala Lumpur, 2021). His practice explores taste and foodscapes as cultural and social constructs. His research-driven projects examine how value systems fluctuate as people move from one culture to another. Reframing mundane aspects of everyday life with irony and wry humour, his multimedia works address the notion of cultural authenticity and they set in motion the frictions and the overlaps produced by the migration of cultural symbols between different sociocultural contexts.

**A Matter of Introduction:
Colonial Perceptions of the Native versus Introduced
in Everyday Philippine *Materia Medica*, 17-18th Centuries**

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This paper will explore documentations of medicinal plants considered to have been introduced to the Philippines through the Spanish or Portuguese trades. Using case studies from extant pre-Linnean colonial sources, I examine how European understandings of Philippine flora led to perceived nativity/non-nativity of botanical materials as they were documented for everyday use.

Marianne Jennifer Datiles is a Filipino American doctoral researcher of botanical *materia medica* at the University College London (UCL) School of Pharmacy, where she previously earned her Master of Research in Ethno-Pharmacology with a distinction. Her academic interests lie in the intersections of human health, history and the natural environment. In 2013 she founded the interdisciplinary initiative UCL Spices and Medicine which explores potent substances across time, cultures and context. She previously worked at the US Smithsonian National Museum of Natural History, the UCL Grant Museum of Zoology and the Wellcome Galleries, Science Museum, London. Prior to UCL she graduated from the Johns Hopkins University where she was an undergraduate Bloomberg Scholar, followed by her Masters of Health Sciences from the Johns Hopkins Bloomberg School of Public Health where she was recipient of the US Health and Human Services HRSA grant. Her current research is supported by grants from the UK Society for the History of Alchemy and Chemistry and the British Society for the History of Science.

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Anthony D. Medrano is the National University of Singapore (NUS) Presidential Young Professor of Environmental Studies at Yale-NUS College. He also holds appointments in the Department of History at the National University of Singapore, the Asia Research Institute, and the Lee Kong Chian Natural History Museum. His teaching and scholarship look at histories of biodiversity research in Singapore and Southeast Asia. He is Principal Investigator of the Social Science Research Thematic Grant titled “Linking the Digital Humanities to Biodiversity History in Singapore and Southeast Asia”. Medrano is completing his first book, *The Edible Ocean: Science, Industry, and the Rise of Urban Southeast Asia*, which is under contract with Yale University Press.

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Darren Chong Jinn Yeo is Head of the Lee Kong Chian Natural History Museum, National University of Singapore, and Associate Professor in the Department of Biological Sciences, National University of Singapore, where he leads the Freshwater and Invasion Biology Laboratory. His main research interests are freshwater ecology and biodiversity, aquatic invasions, and freshwater crustaceans, which are investigated by the lab through studies of freshwater ecosystems in Singapore and other parts of tropical Asia.

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Faizah Zakaria is Assistant Professor in the Departments of Southeast Asian Studies and Malay Studies in National University of Singapore (NUS). She holds a PhD in History from Yale University and an MA in Southeast Asian Studies from NUS. Her scholarship centers on religion and ecology, environmental justice and indigeneity in maritime Southeast Asia. Her book *The Camphor Tree and the Elephant: Religion and Ecological Change in Maritime Southeast Asia* has been published with University of Washington Press in 2023. She has also published in journals such as *Critical Asian Studies*, *Indonesia and the Malay World* and *Journal of Social History*. She is currently working on a second monograph on Southeast Asia's Ring of Fire.

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Jonathan Galka is a doctoral candidate in the History of Science Department at Harvard University. In 2022-2023, he is a visiting scholar in the Department of History at Nanyang Technological University (NTU) and with the NTU Centre for Contemporary Art on its Climate Change and Cultural Loss project. His dissertation examines the 20th-century identification of deep-sea manganese nodules as scientific, political, and economic resources. It uses historical and ethnographic methods to query how the construction of nodules as a mineral resource frontier imbricated the biological and geological sciences with Cold War and postcolonial law and politics. Jonathan is continuing this work in Singapore, as deep-sea nodules take on renewed significance in the green energy transition. Beyond deep-sea minerals, Jonathan is interested in the history of biology, especially of exogenous species in and as technologies. A particular focus is on the history of mollusks and malacology. His work on this topic has been shared in venues including *Island Studies Journal* and *Journal of the History of Biology*. Prior to beginning his doctoral research, he completed a BS in the history of science, and in ecology and evolutionary biology at Yale University, before completing a Fulbright research grant on pre-exposure prophylaxis for HIV among marginalized Malaysian communities.

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