

*Reverse Hallucinations in the Archipelago* unfolds an itinerant encounter with nineteenth-century European naturalists in the Malay world, where the theory of evolution by natural selection emerged alongside less celebrated concerns about mass extinction and climate change; by re-considering the reverse hallucinatory condition of colonial science in the tropics—how scientists learned to not see what was manifestly present—the reader-as-exhibition-viewer may exhume from the remains of this will to knowledge an ethical conviction of particular relevance for confronting forms of neocolonization in the Anthropocene.

# Reverse Hallucinations in the Archipelago

co-edited by  
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# A Future Without Forests

*by Matthias Glaubrecht*

The simple cabin made of logs and sago palm fronds in Dodinga on the island Halmahera in the Moluccas—where the British naturalist and specimen-collector Alfred Russel Wallace allegedly wrote the manuscript of that famous article which so shocked Charles Darwin—has of course long decomposed.<sup>1</sup> Seemingly endless rows of oil palms surround the simple village and the lowlands on both sides of the narrow strip of land. The tropical rainforest where Wallace hunted for butterflies and birds has vanished, and with it many of the inhabitants of this singular—because insular—habitat.

Today, it is also impossible to discern the house on the neighboring spice island of Ternate that for many years had served Wallace as a base camp during his expeditions across the island world of the Moluccas. The environment here has completely changed. The city—now jammed in between the ocean coast and the steep volcanic cone—has expanded heavily towards the north and south, and more than 160,000 inhabitants densely populate the entire island.

A third area Wallace visited several times was the island of Ambon in the center of the Moluccas. Upon steering into the natural port of Amboina, enclosed by the island's southern arm, he was impressed by the coral reefs that rose up close to the surface of the crystal clear ocean. In this water, incredibly rich in marine organisms, he saw an armada of colorful fish, anemones and other anthozoans, as well as other animals such

as starfish, sea urchins, sea cucumbers, and turtles. Submerged down below, the branching and interlacing structures of the corals presented a wild diversity of life similar to the rainforests up on the land.

When one visits the bay of Ambon today, one encounters an overflowing, bustling city, with streets and settlements stretching to the northern edge, displacing and supplanting the forest. The coral reefs and their countless marine inhabitants in the bay have long vanished. The rivers descending from the ridge of the southern peninsula now flow into a bay that has completely silted. As everywhere in Indonesia, the rivers are used as the city's sewers, flushing refuse and garbage directly into the sea.

In both his travels and his theories, Wallace was able to advance into new regions—*terrae incognitae* full of wonders and species hitherto unknown to science. But the world he saw and discovered for European science in the mid-nineteenth century has today disappeared. While one might assume the habitats and organisms he once visited and encountered were lost gradually and continually over the last 150 years, the most significant and largest exploitation actually happened only recently. Indeed, the reckless and radical deforestation of the diverse rainforests, the establishment of endless, homogenous oil palm plantations, and the expansion of overflowing human settlements encroaching on natural habitats is the work of a single generation—our own.

## Singapore and the End of Nature

The sole exception to this narrative is the island state of Singapore, where Wallace arrived in April 1856, because here the forests had vanished early on. Singapore therefore provides a model for understanding what happens when we lose the expanse of Wallace's world in other places—albeit without the prospect of ever copying the city-state's unique economic success. While at the beginning of the nineteenth century, Singapore was a British colony with only a few hundred inhabitants, today its population has grown to more than 4.5 million. Urbanization has displaced more than ninety-five percent of the tropical rainforests, which once covered the island. Large-scale logging and deforestation, the people's passion for hunting, and the excessive development of the city have eradicated about half of the region's endemic species. However, some animal groups record much greater losses, with negative numbers of freshwater fish and mammals being as high as eighty or ninety percent. Initially, the forests were cleared for *caoutchouc* and pepper plantations; later for roads, settlements, ports, and industrial development. In this process, ever more organisms suffered great misfortunes when their habitats were torn away. Today, only a minuscule quarter percent of the total area of Singapore remains forested—and it is here that the remaining species are crowding together. Most of them are threatened by extinction, with some of these species already counting only a mere handful of surviving animals. Regarding such statistics, it should be noted that we tend to record them with a special bias towards attractive or otherwise ostentatious species, while overlooking the conditions of innumerable others.

Tigers, for instance, used to be so numerous in the Singapore of Wallace's era that they are said to have killed on average one person per day; in 1857, tigers caused a total of 390 human fatalities. Back then, Bukit Timah, the woodlands where Wallace initially went to search for insects and birds, was located a little outside of Singapore's city limits; today, this nature reserve is one of the last fragmented forest relics. Long ago, the big cats were so common there that the natives used to call the area "Tiger Resort." Forty years later, in 1896, one of the last tigers was killed here. With 1930 marking the "official" date of the species's extermination in Singapore, it is solely the name "Singa-pura" that continues to evoke a big cat—although the name actually doesn't even refer to a tiger, but to a lion, a species which never existed there.

Elsewhere the *Panthera tigris*—which originally spread from the Asian continent via Sumatra to Java and Bali—did not fare much better. The smallest and darkest subspecies of the tiger living on the easternmost of those three islands, Bali, became extinct the soonest. The last *balica* was shot near Sumbar Kima in the west of the island on 27 September 1937. In the 1940s and early 1950s rumors of alleged sightings emerged, but such proclamations tend to be voiced regarding almost every other large species just after humans have exterminated them. They evoke the phantom sensations of amputated limbs—it is not until things are finally gone that we notice them. Not more than a few skulls, bones, and skins have survived in the collections of some European museums, and these objects are the only remaining evidence that the Bali tiger ever existed.

Around 1900, an estimated 100,000 tigers were alive in Asia, whereas today hardly more than 3,000 of these animals remain. Originally diurnal, these *Felidae* have long been

displaced—both into the night, as well as the national parks. Still, these creatures are hardly guaranteed to survive for much longer in the wild. Four of the eight tiger subspecies have been exterminated in the wild through hunting and poaching; the extermination of the few remaining and dispersed individuals of a fifth species is imminent. Among these species are the Caspian tiger and the Bali tiger, as well as the tiger that used to live in Java and Sumatra (already today more individuals of this subspecies live in zoos than in the wild). In the 1950s, around 4,000 tigers of the southern Chinese *Panthera tigris amoyensis* lived in China; by 1982, at best 200 of these animals were left. In the early 1990s their last traces were found, and since 2000 this subspecies has been considered extinct. The dozen tigers remaining in Chinese zoos are no longer thoroughbreds, but are considered cross-breeds with the *Panthera tigris corbetti*, the Indochinese tiger.

But for Wallace the world was still different. In Singapore, he found traces of tigers that had been hunted with traps; in Bali, he witnessed the locals reporting the presence of a dangerous big cat. He could still see with his own eyes the peculiar distribution patterns of entire faunas. Since then, many of these species have ceased to exist. If you visit Singapore today on a layover and go to one of the park-like resorts on the smaller offshore island of Sentosa, you will encounter only displaced species that originally didn't exist there; the Myna bird from India, for example, or peacocks displaying their plumage next to the yellow-crested cockatoo from Australia. The Wallace Line running between Bali and Lombok has also faded, with innumerable animals having been displaced on both sides of the *Wallacea*—if they have not been entirely exterminated.<sup>2</sup>

While one might respond that the disappearance of the Wallace Line will only bother a few zoologists concerned with historical biogeography, deforestation, and the loss of endemic species, the displacement, mixing, and infiltration of foreign faunal elements are phenomena whose consequences are not by any means exclusively relevant to scientists. Thus, nature's expulsion from Singapore is suggestive of the larger trajectory—Southeast Asia expects to lose two-thirds of its old-growth rainforests by 2100, as well as nearly half of its originally rich diversity of plant and animal species. Not only will the Wallace Line be obscured, but all those species that demarcate its boundary through their habitat will also be lost—many if not all of the butterflies, birds, and mammals he once dedicated eight years of his life to studying.

### Looting the Borneo Rainforests

Species extinction is happening faster and with a wider scope today than in any period of history. Sumatra, Sulawesi, Borneo, and New Guinea seem to be locked in a competition for the most expeditious deforestation. What took nearly 180 years to happen in Singapore has been brought about on these other islands by a single generation since the 1980s. In this process humans are the perpetrators; in a globalized world, each of us is indelibly implicated in the cause, just as our children will be implicated in the consequences.

Wallace's world disappeared nowhere else as dramatically and rapidly as in the interior of the Malay archipelago. When Wallace reached the Sadong River in Sarawak, Northern Borneo (Malaysia), in 1855, he found the richest hunting

grounds in freshly logged mining areas at the edges of otherwise still untouched tropical rainforests. In places where predominantly Chinese miners had "prepared the table" for him with rotting bark for beetles and other insects, the collecting naturalist already benefitted from the colonial looting of natural resources in order to study processes of natural production that were, to him, as foreign as they were magnificent. Today, this kind of nature no longer exists.

On Borneo, large-scale environmental looting began in the 1980s when the loggers working for international lumber corporations arrived. They were the first to attack the lowland rainforests along the coasts of this gigantic island. While between 1880 and 1980 the annual forest loss was estimated at only 0.3 percent, in the past three decades this number rose to 1.4 percent per year. At first sight, this may not seem like a very dramatic statistic; in reality, such losses are both massive and irreversible.

Following Greenland and New Guinea, Borneo is the third largest island in the world. It is two and a half times as big as Germany. The approximately 5,000-kilometer coastline was once enclosed by mangrove forests. During Wallace's expedition, very few of the island's bays could be accessed for settlement construction because the majority of the land was covered with tropical rainforests all the way to the mountain tops. Until thirty years ago, this was true for eighty percent of the island; until twenty-five years ago, for seventy-five percent. Until the 1980s, the rainforests of Borneo were counted among the regions with the highest biodiversity on Earth, including 15,000 species of flowers (as many as in all of Africa); more than 3,000 species of trees (finding more than 1,000 of these species on a single hectare plot was a world record); up to 750

of the 2,000 known species of orchids; 221 mammals; 622 birds; as well as more than 400 different species of reptiles and amphibians (including around 80 lizards, 140 snakes, and 160 frogs). And through further incursions, new species are continuously discovered; in the last few years, a total of 360 new species were discovered in Borneo.

The natural biodiversity of Borneo is disappearing as the island's rainforests are logged faster than anywhere else in the world. According to one study, more trees were logged in Borneo over the last two decades than in Africa and South America combined. Another study has shown that in Kalimantan, the Indonesian part of Borneo, more than half of the tropical rainforest was lost between 1985 and 2001, with devastation occurring on average at 1.3 million hectares of forest per year. In 2008, Indonesia made it into the *Guinness Book of Records* for being home to the world's highest deforestation rate. Recently, more than two million hectares per year were logged in the country. Read in terms of its speed, every one minute Indonesia destroys an area of forest equivalent to the size of five football fields—about 150 hectares per day. In less than a decade, the lowland forests of Borneo will have disappeared entirely.

No other country has destroyed its natural inheritance as fast or as thoroughly as Indonesia. The next generation of Indonesians will inherit no rainforest. Not on Borneo, and most likely not on any other island of the archipelago. Since the 1950s, the forests of Indonesia have been reduced from an estimated 162 million hectares to approximately 88 million hectares—a reduction of at least 74 million hectares. This loss of forty-five percent equals an area about the size of Germany. Yet, taking current trends as an indication, there is no end in sight.

## War Against the Jungle

Screaming chainsaws are heard everywhere in the forest as loggers topple sylvan giants through clear-cutting and slash-and-burn plantation development; these ecosystems are being changed irreversibly. The images of tropical deforestation have become well-known in recent years as the European media relay the advocacy efforts of local environmental organizations fighting to combat the trend. However, the circulation of images does not mean that effective action is being taken to prevent the imminent anthropogenic climate change that is the inevitable consequence of deforestation.

Instead, the war against tropical nature continues in the planet's most fertile forests, with revenue-dependent government agencies, corrupt officials, international "forest products" corporations, and local timber dealers all implicated and entangled. The players continue to send loggers—the poorest of Indonesia's poor—into the woods. The sales of illegally logged and illegally exported timber fill both public accounts and private pockets. Conservationists estimate that three quarters of the wood imported to Germany still originates from illegal sources. Permissive authorities, an absence of enforcement, and pure financial incentives for unrestricted profits have driven the system entirely out of control. In 2003, during a meeting of the most powerful creditors, the Indonesian government declared its own moral bankruptcy when announcing that it was unable to control rainforest deforestation within its own borders, and instead urged the international community to stop importing illegal timber. At the same time, Indonesian authorities facilitated the movement of huge quantities of tropical wood into neighboring

countries to await the required papers for its sale on the international lumber market. But it is not simply the corruption of government and the forest products industry that is to blame; in a global market, every consumer destroys his or her own little piece of the rainforest.

In the meantime, logging has become increasingly lucrative for two reasons. First, the most valuable tropical tree species—Meranti and Ramin—were pulled out of the forests individually through selective logging for many years; selling this wood was highly profitable. But because further profits were sought after, the remaining forests were secondarily made into pulp—literally. Massive concessions enabled large-scale land-clearing in order to supply the pulp mills of international paper companies, who in turn supplied the offices of affluent European businesses with seemingly endless reams of printer and Xerox paper. Finally, in a more recent turn, the extensive cultivation of the oil palm *Elaeis guineensis* became the new super-business upon which Indonesia's GDP continues to grow. Everywhere in Indonesia, oil palm plantation ventures have enriched the plantation owners, corrupt community leaders, and government authorities. Many people in this emerging economy are excited by the promise of wealth and prosperity guaranteed by these plantations; but it is both the poor and the rich who collude, with varying degrees of consent, to annihilate the natural bounty of Nusantara.<sup>3</sup>

Over the past two decades, the extent of the oil palm plantations has expanded tenfold. At present, for every individual tree in the rainforest there are hundreds of thousands of oil palms. The oil, which is pressed from the palms' fruits, is hidden in a huge palette of products—ranging from margarine and other processed foods such as frozen pizza and cheesecake

to cosmetics, including lipstick. The demand for palm oil continues to increase—over the past years by an average of fifteen percent each year. And such demand has increased even more ever since we've started mixing biofuels into gasoline and diesel. For this reason, forecasts that predict a doubling of the demand for palm oil by 2030, and a tripling by 2050, could well be accurate. In many places, this would mean the final death-blow for the remaining rainforests and their flora and fauna.

But it is not only Kalimantan that is subject to the logic of the timber mafia, the oil palm industry, and the violent dependencies these colluding corporations have generated. In 1982, eighty percent of the province of Riau (which is the size of the Czech Republic), on the island of Sumatra, was still covered by tropical rainforest. Subsequently, it took a mere three decades to annihilate around sixty-five percent of the region's primary forest. Everywhere government officials permitted this predatory accumulation of nature's treasures to thrive, accelerating the destruction more recently with the introduction of ever more oil palm plantations. Everywhere we can witness—especially by actually visiting a plantation site, but also simply by way of Google Earth—how logging, fire-clearing, and the development of oil palm plantations continue to advance toward the last remaining areas of tropical rainforests.

## A Veritable Massacre

When considering the loss of rainforest regions and the subsequent cultivation of oil palm plantations, an aspect of the process frequently overlooked is the resulting hundreds of

thousands of species that perish. Not all of their fates are as visible as that of the orangutan, a species Wallace had been especially infatuated with, but one which he nevertheless had few hesitations about shooting for museum collections. Of all the animals suffering as a result of deforestation, the orangutan—literally the “man [*orang*] of the forest [*butan*]”—is the animal species most closely related to humans. Vast regions of the orangutans’ habitat in Borneo and Sumatra have been destroyed. While until 1990, 150,000 orangutans still existed in Borneo, by 2000 their numbers had already shrunk to 55,000; this means it took only two decades to obliterate two thirds of their population. On Sumatra as few as 7,000 of the formerly 200,000 *anthropoids* survive. According to estimates of the environmental program of the United Nations, over the next ten years these red-haired great apes might have disappeared from the wild entirely. Clearly, the orangutans won’t be able to survive in their natural habitat where Wallace had once observed them because, by 2020, this habitat will have almost entirely ceased to exist. In Sabah, Malaysia (northeast Borneo), orangutans already survive only in reservations such as the rescue station of Sepilok, where the animals are kept as a spectacle for tourists without any hope for future re-wilding possibilities. Where could they be returned to given the current devastation?

While the orangutan is a charismatic and well-known species, we perceive the loss of other animals less easily; studies and exact numbers are often lacking. Yet one thing is certain: if the clear-cutting of the forests wasn’t already bad enough, the loggers who cut wide corridors into the woods are typically followed by unscrupulous poachers and animal traders. The Sumatran rhino has been reduced to fewer than 300

individuals in the wild. Likewise, the Javanese rhino, its own subspecies on the island of Java, is on the edge of extinction. The same is true concerning the Asian elephant and the Sumatran tiger, of which there are currently very few individuals left—if at all. Proboscis monkeys, clouded leopards, sun bears, gibbons, Bali starlings, hornbills, and thousands of other endemic species aren’t doing any better. For invertebrates, butterflies, beetles, and other types of insects—some of which will have disappeared forever before they were ever even known to science—the entire ecosystem is under siege.

### Extinction in Amazonia

Other regions of the world are facing a similar situation. In Africa, the tropical rainforest is disappearing by 0.4 percent annually, while in South America this is happening by 0.5 percent. These numbers are surpassed in the Caribbean and Central America, where annual logging rates reach up to 1.2 percent a year. In the Indo-Malayan region, a mere one percent of such forests are left intact, which are home to an original fauna of large mammals. In Africa, one tenth of the original large forests still remain. In the American tropics, especially in the Amazon region, the loss is up to one third.

Biological diversity isn’t distributed evenly across the Earth. Instead, three quarters of all animal and plant species live in the tropical rainforests along the equator, an area which only covers seven percent of the world’s landmass. Half of all mammal species in the world roam the jungles of only three countries—Brazil, Madagascar, and Indonesia. Scientists believe that the forests in the Amazon (predominantly located



within Brazilian territory and amounting to no less than forty percent of the world's tropical rainforest) are home to sixty percent of all of the organisms on the planet. A single hectare of Amazonian forest contains up to 400 different types of trees—ten times more than what exists in all of Central Europe.

Satellite images also show the massive destruction of the Brazilian rainforest. Here, soy plantations and cattle feed lots inexorably maraud their way into the forests—with the resulting landscape taking on a patchwork appearance. Since 2001, the agrarian zones of Brazil have grown by twenty-one percent—while the time it takes to deforest an area has today accelerated by thirty percent compared to only eight years ago. Illegal logging has also increased again; since 2010, illegal practices have risen to more than double the previous numbers in the Amazon.

In the northeastern part of the Amazon basin—where the rainforest is subject to Ecuadorian law—there still exists one of the largest uninterrupted jungle areas on Earth. Here, in the Yasuni National Park, a single hectare of forest boasts biodiversity as rich as all of Mexico, the U.S., and Canada combined. This forest is nevertheless threatened by plans to extract its immense underground petroleum fields. It appears that Ecuador will succumb to the lure of petro-dollar profits, especially after the proposal of the Ecuadorian president to have other nations pay for the conservation of the forest hardly resonated among the international community.

## Forest Clearing and Climate Change

Since forests act as storage for local carbon emissions, deforestation has far-reaching global consequences for every creature on Earth. Logging in the Amazon and fire-clearing in Borneo both accelerate the rise of global temperatures because of the mass of carbon these activities set free. So, in addition to the destruction of biodiversity, massive forest loss is a disastrous process, causing a quarter of all total global carbon emissions. If the statistics of the irredeemable destruction of the tropical rainforests already sounded dire, adding this accelerated carbon release all but guarantees a future without forests.

After the U.S. and China, Indonesia is the third-largest producer of greenhouse gases. The two world powers emit a lot of carbon dioxide because they consume such great volumes of fossil-fuel energy. With much less industry, Indonesia emits such high numbers because the country continues to permit reckless deforestation and burning in order to profit from logging and palm oil. Indonesia and Brazil have both made repeated demands over how other, more affluent nations should compensate them for the economic loss associated with a reduction of deforestation. During recent climate summits, representatives from both countries declared their expectation for financial transfers in the billions to compensate for forest conservation. For years, corrupt officials in the Indonesian government have lined their pockets with the profits made from deforestation and monocrop plantations; it appears they have now identified another chance for profiting from forest conservation and emissions trading. Disaffected, they look on as the depletion of the rainforest destroys both biodiversity and

the livelihoods of subsistence communities, while massively endangering the planet's climate. But what is at stake is also more than the rainforests—looking beyond immediate profits, endless consumption, and excessive greed, humanity threatens itself with extinction on an irreversibly damaged planet.

The wondrous biodiversity that allowed Wallace to perceive the evolutionary dynamics of nature has been rendered the victim of a planetary anthropogenic conflagration. In an article from 1863 about the geography of the Indo-Malayan archipelago, Wallace wrote that the urbanization and destruction of ever more territory by the human species would lead to the disappearance of many forms of life. Yet, in this process, we also destroy the valuable evidence of life's history on the planet as surely as we turn the life of so many species into a lost history.

The Wallace Line will come to exist solely as a line on the map, as a faint memory of the famous but forgotten naturalist after whom it is named. Amazonia and Nusantara, once known to Wallace through such careful, painstaking study, will come to resemble the lost continent of Atlantis and its mythical beings from a long gone era—beings such as the tiger and orangutan, the birdwing butterfly, and the flying frog. The mythical birds of paradise will have come full circle, becoming once again creatures of legend, as they had been before Wallace travelled to the farthest corners of the Archipelago to encounter their strange and singular beauty—only this time, they will be gone forever.

This essay is the revised and translated last chapter of the first German biography of Alfred Russel Wallace, written by Dr. Glaubrecht, entitled *Am Ende des Archipels: Alfred Russel Wallace* (Berlin: Verlag Galiani, 2103), 397–410. It was translated from the German by Anna-Sophie Springer.

Written for a popular audience, the text contains no notes; see Editors' Notes below and "Further Reading" on the next page for relevant source material.

- 1 In 1858, while on an island in the western archipelago (historians are uncertain whether it happened on Ternate or Halmahera), Wallace had a sudden epiphany regarding the evolution of species by natural selection. He posted a detailed letter about it to Charles Lyell in order for him to pass it on to Darwin. At the time, Darwin had not yet published anything significant about his own theories on the subject and was horrified that someone else could now become known for it sooner. With the support Joseph Hooker, another of Darwin's close friends, Lyell thus arranged a public reading of Wallace's paper alongside excerpts of Darwin's writing in a meeting at the Linnean Society of London on 1 July 1858 (see Fig. 05. page xx). Rather hastily, Darwin then published his book *On the Origin of Species* in November 1859 while Wallace continued to explore the Malay Archipelago until his return to England in 1862. Today many biologists are troubled by the fact that in popular history of biology Wallace did not receive equal credit as co-discoverer of the theory of evolution. To access Wallace's digitized letters, see <http://wallaceletters.info>.
- 2 Before Alfred Wegener developed the theory of continental drift in 1912, Wallace deduced that the islands east of Bali and Borneo within the Malay archipelago must have once been separated from the mainland Asian continent through a sea level rise caused by melting ice-age glaciers. Wherever the ocean was narrow but very deep—for example between Bali and Lombok, and between Borneo and Sulawesi—animal species were radically different. The discovery is remembered by the so-called "Wallace Line" running between these islands, marking the division between Asian fauna ("fauna orientalis") and Australian fauna ("fauna australis"). Furthermore, Wallace himself is considered the "father of biogeography" and the term *Wallacea* refers to the biogeographical area east of the Wallace Line, but west of New Guinea and Australia; see <https://en.wikipedia.org/wiki/Wallacea>.
- 3 Based on Old Javanese, "Nusantara" is the contemporary Indonesian term for the Indonesian archipelago.

## Further Reading

- Peter Aldhous, "Borneo Is Burning," *Nature* 432 (2004): 144–46.
- Barry W. Brook, "Catastrophic Extinctions Follow Deforestation in Singapore," *Nature* 424 (2003): 420–23.
- Jonah Busch et al., "Reductions in Emissions from Deforestation from Indonesia's Moratorium on New Oil Palm, Timber, and Logging Concessions," *PNAS* 112 (2015): 1328–33.
- Thomas W. Crowther et al., "Mapping Tree Density at a Global Scale," *Nature* 525 (2015): 201–5.
- Lisa Curran et al., "Low-land Forest Loss in Protected Areas of Indonesian Borneo," *Science* 303 (2004): 1000–3.
- Barbara Fraser, "Carving up the Amazon," *Nature* 509 (2014): 418–19.
- Matthew Hansen, "High-resolution Global Maps of 21st-century Forest Cover Change," *Science* 342 (2013): 850–53.
- William Laurance et al., "The Future of the Brazilian Amazon," *Science* 291 (2001): 438–39.
- William Laurance et al., "Averting Biodiversity Collapse in Tropical Forest Protected Areas," *Nature* 489 (2004): 290–94.
- William Laurance et al., "Agricultural Expansion and Its Impacts on Tropical Nature," *Trends in Ecology and Evolution* 29, no. 2 (2014): 107–16.
- Russel A. Mittermeier et al., "Wilderness and Biodiversity Conservation," *PNAS* 100 (2003): 10309–13.
- Daniel Nepstad et al., "The End of Deforestation in the Brazilian Amazon," *Science* 326 (2009): 1350–51.
- Navjot S. Sodhi et al., "Southeast Asian Biodiversity: An Impending Disaster," *Trends in Ecology and Evolution* 19, no. 12 (2004): 654–60.
- Joe Walston et al., "Bringing the Tiger Back from the Brink: The Six-percent Solution," *PLoS Biology* 8, no. 9 (2010): e1000485.



Deforested plot of land after logging, burning, and construction of drainage canals, Sumatra, circa 1900. Image from the exhibition *125,660 Specimens of Natural History*, Komunitas Salihara Gallery, 2015. Courtesy of the Indonesian Institute of Science.



15



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Three types of coffee beans arranged in comparison, Buitenzorg Botanical Garden, Bogor, Java, circa 1900. Image from the exhibition *125,660 Specimens of Natural History*, Komunitas Salihara Gallery, 2015. Courtesy of the Indonesian Institute of Science.

## Contributors

GEORGE BECCALONI is a zoologist, evolutionary biologist, and historian of science who worked at London's Natural History Museum (NHM) as an entomologist for more than twenty years. He is currently the Director of the Wallace Correspondence Project, which he founded in 2010. He has studied Wallace's life and work for over sixteen years and is a co-executor of Wallace's Literary Estate, which owns the copyright of his unpublished writings. In 1999, Dr. Beccaloni set up the Wallace Memorial Fund, which restored Wallace's grave in Dorset and funded several memorials to him, including a large bronze statue now in the NHM. In 2002, he played a key role in helping the NHM acquire the world's largest and most important collection of Wallace's manuscripts, books, and other items from Wallace's descendants. He has published a number of articles about Wallace and co-edited the book *Natural Selection and Beyond: The Intellectual Legacy of Alfred Russel Wallace* (Oxford University Press, 2008). He was also a scientific consultant for the video *The Making of a Theory: Darwin, Wallace, and Natural Selection*, one of two narrators of *The Animated Life of A.R. Wallace*, and the historical consultant for the multi-award-winning two-part BBC series *Bill Bailey's Jungle Hero*.

LUCY DAVIS is an artist, writer, and Associate Professor. She lived for twenty-eight years in Singapore, teaching at the School of Art Design & Media, Nanyang Technological University from 2005–16 where she founded the Migrant Ecologies Project. Her practice encircles animal and plant studies, natural histories, materiality, and memory in Southeast Asia.

Exhibition venues include the Taiwan International Video Art Exhibition, M1 Singapore Fringe, National University of Singapore Museum, Singapore Art Museum, National Museum of Singapore, Royal Botanic Gardens Edinburgh Art/Science Festival UK, the International Symposium on Electronic Arts (ISEA), and the National Gallery of Singapore. Her animated short *Jalan Jati (Teak Road)* toured widely and was awarded a Promotion Award at Oberhausen ISFF (2012), two Singapore Short Film Awards (2013), and Jury Mention for Technical Achievement, ISFF, Iran (2015). *Migrant Ecologies* were nominated for the Signature Asia Pacific Art Prize, Singapore Art Museum (2011) and were finalists for the Prix COAL France (2011). Davis is Southeast Asia Contributor for *ANTENNAE, The Journal of Nature in Visual Culture* (UK). She has written for: *Why Look at Plants?*, *Considering Animals*, *The DOCUMENTA #12 READER*, *BROADSHEET Art & Culture*, *Art AsiaPacific*, *Inter-Asia Cultural Studies*, and *NU The Nordic Art Review*. Davis was founding editor of the publication series *FOCAS Forum on Contemporary Art & Society* from 2000–07.

FRED LANGFORD EDWARDS is a visual artist living in North Wales, UK, with over twenty years experience in interdisciplinary work and collaboration with museums, scientific, pharmaceutical and educational institutions, creating contemporary works of art that draw on broad cultural histories and disciplines. With these works, Edwards is interested in exploring and making reference to academic, reserve, and private collections, which are rarely seen by the general public, as hidden archives of the history of science and ideas. More recently, he has worked in the field investigating medicinal plants

and related flora in the equatorial rain and cloud forests of Napo Province, Ecuador, and on the contributions of the British naturalist Alfred Russel Wallace to contemporary scientific thought. In 2015, his large-format photographic prints of Wallace's specimens were a major highlight of the exhibition *125,660 Specimens of Natural History*, Komunitas Salihara, Jakarta.

CHRISTINA LEIGH GEROS is an architect, landscape architect, and urban designer currently conducting and designing research about the intricate relationships between urbanism, ecology, and politics. Based in Jakarta, she is the Design Director of an exact office and the Design Research Strategist with the MIT Urban Risk Lab's PetaBencana.id field team in Indonesia. She is also a co-founder and co-investigator in the multidisciplinary collaborative SHO—a design practice working across a variety of scales, materials, technologies, processes, and mediums. Focusing on urban and ecological issues in Indonesia, Geros's work as a Fulbright National Geographic Digital Storytelling Fellow has used written, photographic, and videographic methodologies to communicate complex urban issues to a global public audience. Having been awarded several other research fellowships and design competitions—including the Penny White Prize at Harvard University's Graduate School of Design, the Rajawali Research Grant from Harvard University's Kennedy School Indonesia Program, and Harvard University's Radcliffe Institute Public Art Competition—Geros aims to merge design and research practices through multi-media publications, exhibitions, and spatial installations.

MATTHIAS GLAUBRECHT is the founding Scientific Director of the Centrum für Naturkunde, Universität Hamburg, where he also holds a full professorship in Faunal Biodiversity. Between 1997 and 2014 he worked as an evolutionary biologist and historian of science at the Museum für Naturkunde Berlin, where he was also a curator of mollusks. From 2006–09, he directed the museum's new department of museological research and was a member of the board of directors. In 2009 he was one of the main curators of the exhibition *Darwins Reise zur Erkenntnis*. Since 2008 he has been an elected member in the Zoology department of the German Research Foundation (DFG). Until fall 2014, Prof. Dr. Glaubrecht taught Evolutionary Theory, Biogeography, and History of Science at Humboldt-Universität zu Berlin. In addition to numerous articles in scientific publications, he regularly writes for newspapers and magazines, and occasionally advises filmmakers in their work about naturalists. His popular books include biographies of Charles Darwin and Alfred Russel Wallace. Additionally, he is the Editor of a revised German translation of Wallace's writings about his South American expedition, *Abenteuer am Amazonas und Rio Negro* (Galiani Verlag, 2014).

RADJAWALI IRENDRA is a political ecologist and environmental activist focusing on illegal land grabs and deforestation in Indonesia. Radjawali is in the final stages of his Ph.D. in Geography from Universität Bremen. After eight years in Germany—which also included working on a research project at Rheinische Friedrich-Wilhelms-Universität Bonn—he recently returned to his home country, Indonesia, where he founded the Akademi Drone Indonesia, an organization that works with Indigenous

communities to gather and analyze data using DIY drones. He collaborates closely with WALHI (The Indonesian Forum for the Environment) and AMAN (Alliances of Indigenous Communities in Indonesia), and his self-constructed drones are used collectively by local and Indigenous communities as well as other NGOs across Indonesia and beyond. Among other places, his mapping work was presented at the Indigenous Pavilion of the UN Climate Summit COP21 in Paris.

GERALDINE JUÁREZ is a Mexican artist living in Gothenburg, Sweden. Her work across media technologies as subject and material focuses on understanding their role in the construction of dominant knowledge infrastructures and their related economic narratives. Recent exhibitions include *Strictly Professional*, Galleri 54, Gothenburg; *Totally Sick!*, Medicine History Museum, Gothenburg; *LOOP*, Cirkulation Centralen, Malmö; and the online auction/exhibition *#exstrange*, as well as *Dreamlands: Immersive Cinema & Art, 1905–2016* (with Lorna Mills) at the Whitney Museum of American Art, New York. Recent commissions include “Works for Radio” for *The Lake*. In 2015, Juárez developed an initial installation of *Intercolonial Technogalactic* for the exhibition *125,660 Specimens of Natural History*, Komunitas Salihara, Jakarta. Her writing has been published in *Continent*, *The Radiated Book* (Constant, 2016), and *Scapegoat – Journal for Landscape, Architecture, Political Economy*. Currently she is studying in the MFA program at Valand Academy, Gothenburg.

ALIFA RACHMADIA PUTRI is a researcher with a focus on urban infrastructure, city management, public space provision, and sustainable transportation. Her undergraduate thesis,

completed in the Faculty of Social & Political Sciences, Universitas Indonesia, addressed the challenges of financing large-scale, complex infrastructure in Indonesia. Following graduation, she worked as Office Coordinator at PetaJakarta.org and as City Planning and Operations Division staff at DKI Jakarta Governor's Office. Rachmadia Putri also was Curatorial Assistant for the exhibition *125,660 Specimens of Natural History*, Komunitas Salihara, Jakarta, 2015. She is currently studying urban planning at Harvard University.

WIDYA AULIA RAMADHANI is currently in her final year of graduate school in architecture at the University of Illinois at Urbana-Champaign. She has a special interest in the intersection between architecture and human health, as she believes it is highly dependent on environmental conditions. Participatory design methodology has been her obsession since her undergraduate study, so she really enjoys design processes that involve discussion and charrette with users. Ramadhani is currently exploring her interest in the intersection between gerontology and architecture. She has been doing research in architecture, as well as other related fields like art, urban studies, and community health. Previously, she worked as a Teaching Assistant at Universitas Indonesia, Research Assistant at PetaJakarta.org, and Multimedia Assistant at disability resources and educational services at UIUC. In winter 2017, she was an intern architect at Studio Christian Wassman in New York City. After her graduation, she hopes to work at a research-based architecture firm and become a professor back in Indonesia.

JAMES M. RUSSELL is an Associate Professor in Brown University's Department of Earth, Environmental, and Planetary Sciences, and a fellow of the Institute at Brown for Environment and Society. His primary research interests are the reconstruction of long-term climate change in the tropics and its impacts on terrestrial environments. His graduate work at the University of Minnesota investigated the climate of the Holocene (the last 10,000 years) using lake sediment records from central Africa, earning a Ph.D. in Ecology and Evolutionary Biology in 2004. He began working in Indonesia in 2006 to develop high-resolution environmental records from Eastern Java. Dr. Russell has led numerous lake coring expeditions in Africa and Southeast Asia, most recently leading a team of over thirty scientists in the Towuti Drilling Project in 2015, which drilled 160-meter-long sediment cores from large tectonic lakes in central Sulawesi, Indonesia. He has authored or co-authored over seventy papers on tropical environmental change in the past fifteen years.

MARK VON SCHLEGELL's experimental writing practice crosses boundaries of literature, taste, art, theory, pulp, and science fiction. Published by Semiotext(e), the "System Series" novels *Venusia* (2005), *Mercury Station* (2009), and *Sundogz* (2015) consider the imaginary survival of post-human and AI culture in space after the fall of Earth. Shorter art and architecture related science fictions have been published in the volumes *New Dystopia* (2012) and *Ickles, Etc.* (2014) by Sternberg Press, Berlin. Two books of literary theory, *Realometer* (Merve, 2009) and *Dreaming the Mainstream* (Merve, 2013), explicitly trace the relation of literature to the fabrication of the contemporary real. A literary

activist since the 1990s, von Schlegell continues to extend the imaginary reach of science fiction and literary theory into art, books, periodicals, performances, films, and new forms the world over. *Roussel Returns*, a critical reassessment of the writings and influence of Raymond Roussel, has just been published as a special pamphlet edition by Semiotext(e).

SLAVE PIANOS (founded in Melbourne in 1998) is a collaboration between artists Danius Kesminas and Michael Stevenson, and composers/musicians Rohan Drape and Neil Kelly, recently joined by inventor Dave Nelson and architect Antanas Kesminas. They make historically grounded, research-based installations and performances utilising humor, immediacy, and the conflation of "high" and "low" idioms to suggest connections and interrelations between the largely discrete fields of music, art, and architecture. SLAVE PIANOS has performed and collaborated with Punksila, Fluxus luminaries (Jonas Mekas, Larry Miller, Alison Knowles, Geoffrey Hendricks, Eric Andersen and Tamás St. Auby), Vytautas Landsbergis (the first post-Soviet president of Lithuania), June Mills (Larrakia Elder), Merce Cunningham, Flux Quartet, Arditti String Quartet, Michael Kieren Harvey, DJ Olive, Barney McAll, Krasnyi String Quartet, Chamber Made Opera, John McCaughey and ASTRA, Richard Piper, the Royal Australian Navy Band, Mark von Schlegell, Chris McAuliffe, and many others.

ANNA-SOPHIE SPRINGER is an independent curator, writer, and the Co-Director of K. Verlag in Berlin. Her research-based practice merges curatorial, editorial, and artistic commitments by stimulating fluid relations among images, artifacts, and

texts in order to produce new geographical, physical, and cognitive proximities, often in relation to historical archives and the book-as-exhibition. Her previous curatorial projects include the series *EX LIBRIS* (2013) on how to make exhibitions out of books and libraries at Hochschule für Grafik und Buchkunst Leipzig (HGB); Galerie Wien Lukatsch, Berlin, and Arg.org. With Etienne Turpin, Springer is a Co-Principal Investigator of *Reassembling the Natural*, an exhibition-led inquiry into the meaning of natural history collections in the Anthropocene. In 2015, they co-curated *125,660 Specimens of Natural History* at Komunitas Salihara in Jakarta, Indonesia, in partnership with the Indonesian Institute of Science; the new exhibition cycle for 2017–18, *Disappearing Legacies: The World as Forest*, is funded by the German Federal Cultural Foundation and the Schering Stiftung. In addition to co-editing the *intercalations: paginated exhibition* series, she is also the co-editor of *Fantasies of the Library* (MIT Press, 2016), as well as the editor of numerous K. publications (many in collaboration with Charles Stankievech), and the translator of books by Mark von Schlegell and Nina Power (Merve, 2009/11). She received her M.A. in Contemporary Art Theory from Goldsmiths College, University of London, and her M.A. in Curatorial Studies from HGB, Leipzig. In 2014, she was the Craig-Kade Visiting Scholar-in-Residence at Rutgers University. She is currently a Visiting Lecturer at Institut Kunst, Basel, and a Ph.D. student at the Centre for Research Architecture, Goldsmiths, where her research examines the financialization of nature and the role of natural history collections in a time of ecological collapse and mass extinction.

ZENZI SUHADI is currently the Head of the Department of Research, Advocacy, and Environmental Law at the national executive office of the WALHI (The Indonesian Forum for the Environment) in Jakarta. With a background in biology from the University of Bengkulu, his home province on the island of Sumatra, Suhadi has been an active member of WALHI since 2005, originally joining the NGO in Bengkulu province. From 2008 to 2012 he was the Executive Director of the local office there, working hard to support the region's communities in their struggle against corruption, illegally granted mining and plantation concessions, land grabbing, environmental pollution, deforestation, and the frequent application of physical violence against protesters and affected individuals in local villages. Since 2012, Suhadi has worked in WALHI's national office, where until 2016 he held a Campaigner position, focusing on forests and large-scale plantations. In both this and his current position he has been advising the Indonesian government and foreign diplomats in their stance and policies about plantations, palm oil, ecosystem restoration, forest fires, and the haze problem, as well as the Peatland Moratoria from 2014 and 2016.

ERWAN HERSI SUSANTO, also known as Iwank Celenk, was born in 1977 in Kediri, East Java, Indonesia. He graduated from the Design Faculty at Institut Seni Indonesia, Yogyakarta, where he resides. He currently works as an illustrator in a production house and freelances as a comic artist under the name Yellow Teeth Comics. He plays guitar in several bands, including Kornchonk Chaos and Iwank Fals. Besides illustrating the *Darwin Proboscis*, Iwank is also the bassist in Punksila.

KATHARINA TAUER is a graphic designer currently living and working in Berlin. After completing her M.A. in Art Direction with a focus on type design at ECAL (École cantonale d'art de Lausanne), in 2012, she moved to London and built up a solid, work experience at Zak Group. Tauer now works on self-initiated projects, as well as commissions and freelance jobs, maintaining a focus on book design and the cultural sphere.

PAULO TAVARES is an architect based in Brasília, where he currently holds an Adjunct Professor position at the Faculdade de Arquitetura e Urbanismo, Universidade de Brasília. He is a long-term collaborator with the Forensic Architecture Project and has published and lectured widely in different contexts and locations, including ETH Zurich, Haus der Kulturen der Welt, Ireland Biennale, Mercosul Biennale, Perez Art Museum Miami, and São Paulo Biennale. In 2015, he was a Visiting Scholar at the School of Architecture at both Princeton and Cornell Universities. Prior to that, Dr. Tavares taught Design Studio and Spatial Theory at the School of Architecture, Design, and Arts of the Pontificia Universidad Católica del Ecuador in Quito, and at the Centre for Research Architecture, Goldsmiths, where he also completed his Ph.D. His work has been exhibited in various venues worldwide, including BAK, Utrecht; Fundación PROA, Buenos Aires; Haus der Kulturen der Welt, Berlin; the Taipei Biennale; and ZKM, Karlsruhe.

RACHEL THOMPSON is a musician, filmmaker, and Ph.D. candidate in Anthropology and Critical Media Practice at Harvard University. Thompson holds an MFA in Visual Arts from UCSD, and an M.A. and B.A. in

Music from Wesleyan University. As an arts educator and media producer, she has worked at the Walker Art Center and the J. Paul Getty Museum. With collaborator Jonathan Zorn she co-founded the imprint SET Projects, devoted to experiments in electro-acoustic and improvised music. She has guest-lectured throughout the United States and has taught courses in film history/criticism, new media theory/practice, and experimental music. Her prior work has examined the cultural and political legacies of colonialism, the dynamics of cultural exchange and assimilation, and artistic practice in the wake of political violence. Her current research and film projects explore the long-term entanglements between Indonesia and the Netherlands through the lens of political ecology. Thompson's contribution to this volume derives from a fragment of her essayistic film *Extinction Number Six* (2011), which tracks an eccentric narrator's quixotic search for the material traces of Java's colonial, mystical, and paleontological past—a journey haunted in equal measure by the 1815 eruption of Mount Tambora and the still-murky events of the 1965 Indonesian coup d'état and subsequent anti-communist massacre.

ETIENNE TURPIN is a philosopher, Research Scientist at the Massachusetts Institute of Technology, and Founding Director of an exact office in Jakarta. With Anna-Sophie Springer, Dr. Turpin is a Co-Principal Investigator of *Re-assembling the Natural*, an exhibition-led inquiry into the meaning of natural history collections in the Anthropocene. In addition to being the co-editor of the *intercalations: paginated exhibition* series, he is also the co-editor of *Fantasies of the Library* (MIT Press, 2016), *Art in the Anthropocene* (Open Humanities Press, 2015), and *Jakarta:*

*Architecture + Adaptation* (Universitas Indonesia Press, 2013), and editor of *Architecture in the Anthropocene* (Open Humanities Press, 2013).

SATRIO A. WICAKSONO is the Forest and Landscape Restoration Manager at the Indonesian branch of the World Resource Institute (WRI). Working closely with the Global Restoration Initiative team based in Washington D.C., he leads WRI restoration efforts in Indonesia and conducts research on Indonesian restoration, forestry, land use, and other natural resource issues. Together with key stakeholders in restoration, Wicaksono works to address obstacles and galvanize support and commitment to landscape restoration in Indonesia, both at the national and local levels. Before joining WRI, as part of his graduate research, he was Project Coordinator for the Towuti Scientific Drilling Project, the first international continental drilling project in Southeast Asia. In May to July 2015, the Project worked to recover

one of the longest continuous terrestrial sedimentary sections from Indonesia, which will be used to reconstruct regional climatic and environmental history during the past 650,000 years. He also served as the North American Liaison Officer for the International Indonesian Scholars' Association. Wicaksono is currently completing a Ph.D. at Brown University on the variability of Indonesian precipitation and vegetation across geological and historical timescales. He holds a M.A. in Geological Sciences from Brown University and a B.A. from Wesleyan University, where he double majored in geology and environmental studies, and completed a certificate in international relations.

↳ Javanese men studying a set of teaching charts about rice cultivation (on the floor in the center: two bushels of harvested and dried rice plants), Buitenzorg Botanical Garden, Bogor, Java, circa 1900. Image from the exhibition *125,660 Specimens of Natural History*, Komunitas Salihara Gallery, 2015. Courtesy of the Indonesian Institute of Science.





## intercalations 3: Reverse Hallucinations in the Archipelago

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