Reinhold Leinfelder • Alexandra Hamann • Jens Kirstein • Marc Schleunitz (Eds.)

Science meets Comics

Proceedings of the Symposium on Communicating and Designing the Future of Food in the Anthropocene

Jaqueline Berndt • Anne-Kathrin Kuhlemann • Toni Meier • Veronika Mischitz
Stephan Packard • Lukas Plank • Nick Sousanis • Katerina Teaiwa • Arnold van Huis

CH. A. BACHMANN VERLAG

Editors

Reinhold Leinfelder
Freie Universität Berlin
Institute of Geological Sciences
Berlin, Germany

Alexandra Hamann
Cluster of Excellence *Image Knowledge Gestaltung*
Humboldt-Universität zu Berlin
Berlin, Germany

Jens Kirstein
Freie Universität Berlin
Institute of Geological Sciences
Berlin, Germany

Marc Schleuniz
Freie Universität Berlin
Institute of Geological Sciences
Berlin, Germany

This publication was made possible by the Cluster of Excellence *Image Knowledge Gestaltung. An Interdisciplinary Laboratory* of Humboldt-Universität zu Berlin and by the Freie Universität Berlin. Financial support came from the German Research Foundation (DFG) within the framework of the Excellence Initiative.

Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at http://dnb.dnb.de.

Layout and typesetting: Alexandra Hamann & Jens Kirstein
Proofreading: Andrea Schlosser
Cover illustration: © 2017 by Ruohan Wang
Printed in Germany by docupoint GmbH, Barleben

Print ISBN 978-3-941030-92-3
E-Book ISBN 978-3-941030-93-0

Bild
Wissen
Gestaltung
Ein Interdisziplinäres Labor

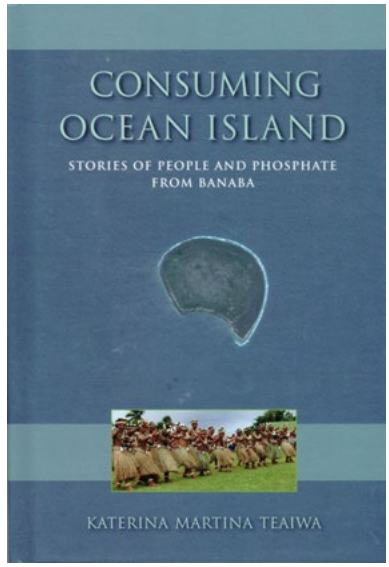
Gefördert durch die DFG

Freie Universität Berlin

Dr. Katerina Teaiwa was born and raised in Fiji and is of Banaban, I-Kiribati, and African American descent. She is Associate Professor in the School of Culture, History and Language, College of Asia and the Pacific at the Australian National University in Canberra. She is also President of the Australian Association for Pacific Studies. From 2011 Katerina has been a Research Fellow in *the Framing the Global Research and Publication Project* at the Center for the Study of Global Change at Indiana University. She is the author of *Consuming Ocean Island: Stories of People and Phosphate from Banaba* (Indiana University Press 2015).

Dr. Teresia Teaiwa is an award winning scholar and mentor, and the founder of Pacific Studies at Victoria University of Wellington. She is currently Director of Va'aomanu Pasifika which includes Pacific Studies and Samoan Studies. A practising poet, Dr. Teaiwa is also researcher and author of numerous articles and book chapters on history, art, politics, gender and militarism in Oceania. She interviews a variety of Pacific women activists, authors and artists on her *microwoman blog* (microwoman.wordpress.com).

Interview with Katerina Teaiwa by Teresia K. Teaiwa for Microwomen



Katerina Teaiwa (2015): *Consuming Ocean Island: Stories of People and Phosphate from Banaba*, Indiana University Press. Cover

Microwoman: Congratulations on the publication of your book, Kat! How long did it take you to pull it all together?

Katerina Teaiwa: Oh, hello, big sister, thank you!

I began historical research on Banaba in 1997 as part of my Master's at the University of Hawai'i (UH) and continued from 1999 at the Australian National University (ANU) as a Ph.D. scholar in anthropology. I was very inspired by your work and early writing about contemporary Banaban identities and, as you know, Dad became a key interlocutor and provided much support for my work. This was always a family project, even when I was in a more academic or analytical mode.

I finished my Ph.D. in 2003 after lots of archival research and fieldwork (I called it 'homework'), and then took a break while I taught at UH for 3.5 years. I then dived back into archival work at the Macmillan Brown Centre for Pacific Studies at the University of Canterbury in Christchurch in 2006. John Macmillan Brown had shares in the phosphate company in the early 1900s.

I had to take another break after I began a new job at ANU in 2007 with a few trips to the archives every year and visits to Rabi in Fiji. I had also collected many hours of film footage and archival photographs, and

Dr. Katerina Teaiwa, Dr. Teresia Teaiwa and younger sister, Dr. Maria Teaiwa, 1977

transformed some of these into short visual studies and collaborated with artists and curators to share this history in visual and multimedia forms. Finally, in 2010 I began to reimagine this as a book proposal and finalized that in 2011 while on a fellowship at the University of Rochester in New York. Thus began the task of taking apart my Master's and Ph.D. research, reconstructing parts I could use in a book and writing five new chapters. This took almost two years and it went through a long process of feedback from three reviewers, and three editors at Indiana University Press in the same period. The challenge was to write this story for a wider audience and particularly American readers who are unfamiliar with Oceania and Pacific studies.

Banaban dancers, Ocean Island, 1901. Courtesy of the National Archives of Australia

I think reimagining the book in this way made it better but it was a long, challenging process. For a 4-month period I was in my office 'till midnight on many days and lost at least 7 kilos, but was so happy when everything finally came together at the beginning of 2014, and I had a real book ready to finalize for publication. I really appreciated the detail and attention that came to the book because of the rigour of the Indiana University Press team, as well as the additional readings and edits provided by great colleagues such as Margaret Jolly, Carolyn Brewer and Rachel Harvey, and my husband, Nick Mortimer. So, the short answer is 15 years of research and preliminary writing, and two years of book writing!

MW: That's a pretty epic process! But wait – so Americans were the main or intended audience of your book?

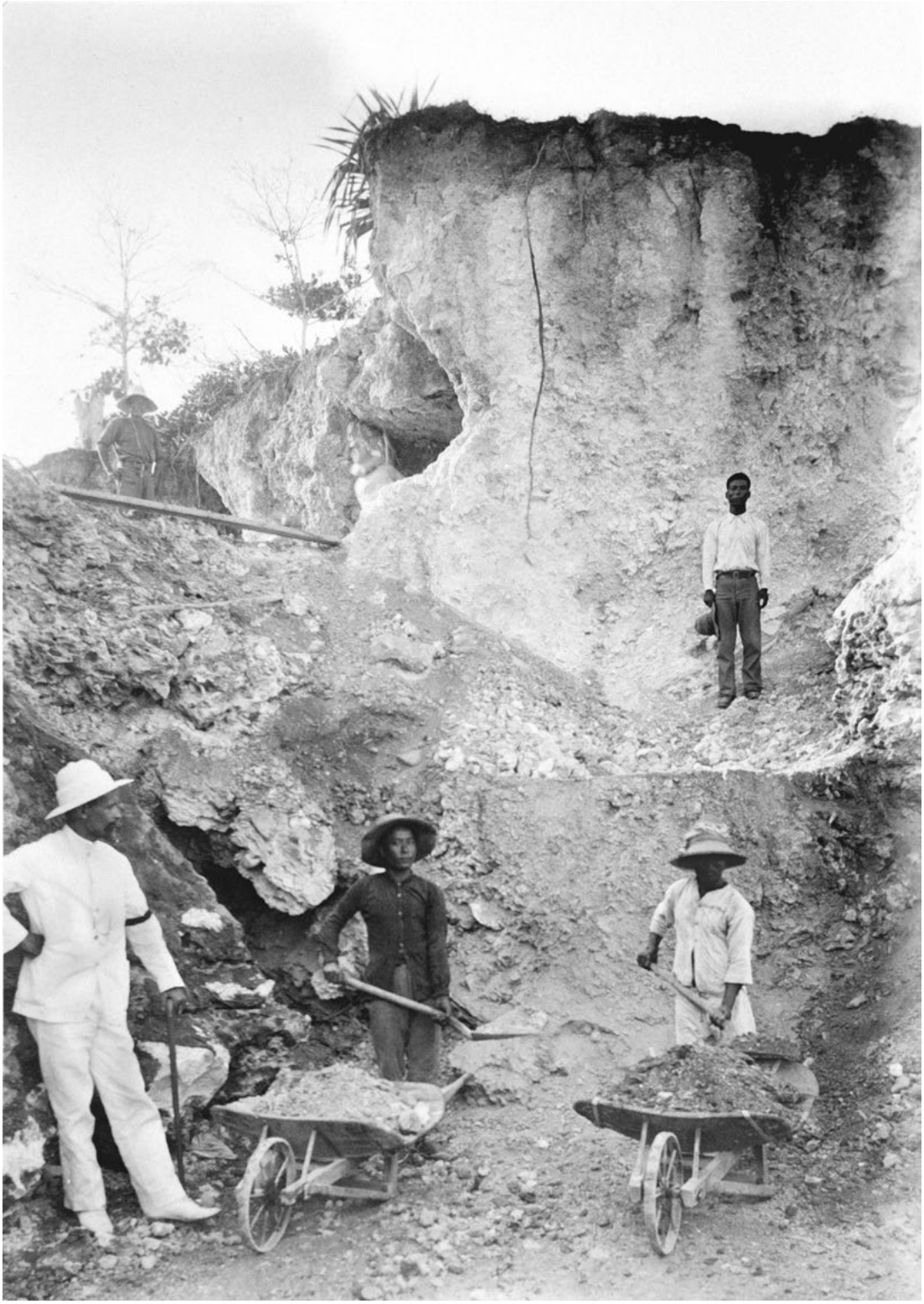
KT: I tried to write the book for anyone (or everyone) but had Banaban, I-Kiribati, Pacific Islander, Australian, New Zealand, American, and global audiences in mind, in roughly that order. I hoped people involved in environmental studies, activism, mining, resource extraction, and agricultural research or activities might also pick it up and contemplate the impact of fertilizer manufacturing and mass agriculture on indigenous peoples.

MW: What plans do you have for making sure Banabans have access to your book?

KT: I have been in conversation with Banabans who have access to the internet through a Facebook group – *Banaba: Untold Tales* – run by Kata Tawaka. It has about 300 members and I've posted all news or media and information to that page. I've also got a copy of the book for the community library on Rabi, and have given a copy of the book to the President of the Banaban group in Brisbane to share with the growing community there. I plan on sending copies to the Presidents of Kiribati and Nauru as well.

MW: Your book sits in a bibliographic genealogy that has Harry Maude's *Book of Banaba* (1994), King and Sigrah's *Te Rii ni Banaba* (2001), and Shennan and Tekenimatang's *One and a half Pacific islands: stories the Banaban people tell of themselves* (2005) as some of its predecessors. How is your book different from these? What do you think Banaban readers will make of it?

KT: Indeed , Banabans are familiar with certain versions of their history (from Maude, Grimble, Williams and Macdonald) and Jennifer Shennan, Makin Tekenimatang, Ken Sigrah, and Stacey King have produced recent books telling many Banaban and European versions of this history and contemporary Rabi life. I wrote to Ken and mentioned that I do not cover the te aka version of Banaban history as this is not something I know enough about. Wolfgang Kempf and Elfriede Hermann have also written many articles and book chapters about life and identity on Rabi. But I think what my book does that these works do not, is explicitly link Banaban history to that of a deep history of land, global agriculture, phosphate mining, and the significance of the phosphorus element. I thought as much about what happened to the land as to the people and previous authors have focused more on people. So I hope Banaban readers will say: "oh, that's why they wanted our phosphate so much and this is the role it played in global agriculture." And they



"Ocean Island – Very good phosphate country – No coral pinnacles in picture except the mass at back of Mr. A. F. Ellis and the corner one at right of the picture, half way up – Lower levels untouched – Ooma - September 1910." Courtesy of the National Archives of Australia

might ask: "so what is 'te aba' really, and why should we know more about the science and technical aspects of phosphate mining and environmental destruction?" I argue that what happened to the land is like what happened to the people and both are still waiting to be rehabilitated in a just fashion.

MW: Your book is part of a series called *Tracking Globalization*. Why was it important for you to tell the stories of Banaban people and phosphate in the context of globalization?

KT: Well, as a Banaban, I became very, very, very interested in what phosphate and phosphorus were and why these were such valuable elements and commodities. If we lose an island, what does everyone else gain and was it worth the sacrifice? Turns out that the globe has these planetary boundaries and phosphorus has a key role to play in the maintenance of our ecological systems. This is something I think Banabans need to know; the mining destroyed not just our island but phosphorus is a limiting factor for life on earth because it's normally locked away in inaccessible forms like rock and takes a long time to naturally cycle back through the system. So messing with natural cycles in order to mass produce food might provide short term solutions for food security but results in all kinds of other problems in terms of siphoning off key minerals strictly for human needs while destroying landscapes, oceanscapes, plant and animal life, and cultures in the process.

Banaba/Ocean Island, size of area 6.0 km^2
© 2012 DigitalGlobe Google images

I used to wonder if I'd ever use my Bachelor of science degree from Santa Clara University but it sure came in handy for this research. I could generally follow the geology, biology, and chemistry I had to read to write new chapters of the book but

I was still unsure – so went to the Commonwealth Scientific and Industrial Research organization (CSIRO) in Canberra and spent a bit of time with an agricultural scientist checking things. I hope Banabans will rethink te aba, or abara (our land), in these material and global terms and realize what role our small ancestral island played not just in terms of developing Australian and New Zealand agriculture but as part of a global environmental and agricultural system. Tracking Banaban lands and peoples is a global tracking in many ways because of the chain of phosphate and superphosphate commodities, and the agricultural commodities and processes that are linked to fertilizer production and application.

Banaba pinnacles left over from heavy minig, April 2000. Photo by Katerina Teaiwa

MW: There was also another American guy who was doing a global history of phosphate, right? What was his name? Are you and he saying similar things about phosphate's role in processes of globalization?

KT: Greg Cushman wrote *Guano and the opening of the Pacific world*. I discovered it just as my book was finished and wrote to him to say: "great, I'm interested in

your work." He never received my email and I've only seen small bits of his book, but it does tell some of the Banaban story based on archives and Sigrah and King's book. I'm not sure if he travelled to Rabi and Banaba. His is very much a global history linking South America and the Pacific [update: Cushman invited me to be part of a Munich based project exploring the role of phosphorus in agricultural, environmental, historical, and cultural contexts].

But guano and phosphate are a bit different in terms of geological life, access, mining technology required for extraction, and proportions of phosphoric acid available for agricultural use, or in terms of what industries need to do, to the raw material in order to unlock the phosphoric acid (that's what you need to help improve the capacity of plant roots to take in nutrients and thrive).

Guano mining played out a bit differently in South America and Oceania but the same companies (like the Pacific Islands Company) were involved in both types of extraction and exploitation of labour and indigenous land. Guano really is piled up bird and bat poo, while phosphate is locked away in rock formation.

MW: That's interesting. You did a lot of archival research for the Ph.D. and this book, but your doctorate was awarded in anthropology. How important was anthropology for the way you've ended up writing the book?

KT: My writing is ethnographic. I tell stories, many in rich detail, so I'd say ethnography rather than anthropology *per se* was very important. However, anthropologists' previous work was very important, as was that of historians and a few scientists. So it could be described as historical ethnography but it was not written to engage or debate some particular theme, theory, or issue in the discipline.

MW: Have other disciplines influenced your analysis and writing in this book? How?

KT: History and anthropology have been the major disciplinary influences (I adore archives, they are so exciting) but interdisciplinary Pacific Studies is where my work sits, I think. And that includes the indigenous studies and cultural studies elements of Pacific Studies. Cultural Studies and Women's Studies on their own have also influenced my thinking and work, especially in terms of the politics of knowledge and cultural production.

It's not a discipline *per se* but analytically, methodologically, and politically, feminist ethnography had a major impact on my Ph.D. years, especially the writing of Kamala

Visweswaran (*Fictions of Feminist Ethnography*), Dorinne Kondo, Ruth Behar, Deborah Gordon, all the *Women Writing Culture* folks, especially Kirin Narayan. She is such a master storyteller.

Dance Studies also had a massive impact on my work, especially the work of Susan Leigh Foster, Deidre Sklar, and Sally Ann Ness. I think I write as a dancer, even when I'm not writing about dance.

MW: This is a microwoman interview, so can you tell us a bit about how women feature in your book? You've been influenced by feminist ethnography, so do you consider yourself a feminist? Can you say more about how feminism informs your work?

KT: My two academic goddesses are Kirin Narayan and Kamala Visweswaran. Yes, I'm a feminist but I find any superficial and simplistic varieties of western feminism irritating. I'm a feminist in a Catholic, indigenous, eco-critical, multi or inter-spiritual kind of way. I tell my daughter God is not gendered and definitely not a man sitting in the clouds. I believe in gender equity and equality.

Gender was not the focus of my research but I noticed it everywhere, including in the archives, and Carolyn Brewer, who worked with me on the index, found much more content than I remembered thematically on women, children, and gender issues in my book. This was especially the case with respect to land, land rights, colonialism, Christianity, spirituality, oral traditions, and resistance amongst the Banabans.

MW: Just changing tack a bit, we've been talking about academic influences a lot so far, but I wondered whether there were other less academic influences you might like to discuss. For example, have you felt our ancestors' spirits intervene or assist in the process of researching and/or writing this book at any point?

KT: Ok, I have. And it's never popular or a good move to discuss this in an academic (or public) context, unless you're talking to certain indigenous and Pacific Studies folks in Hawai'i, New Zealand, and the U.S. I have a couple of colleagues who I can talk to about such things at ANU but it's usually a no-go zone, as is revealing you have any kind of membership in organized (or disorganized) religion. Academics aren't expected to be spiritual, and definitely not religious as, scientifically, your objectivity will be seen to be compromized.

Usually I'm not sure if I'm living up to our ancestors' expectations. Right from the beginning of the research process, if not before, I had many dreams of people trying to instruct me on Banaban or Kiribati or indigenous knowledge and ways of doing or seeing things. After I went to Banaba in 1997 and 2000, I had several dreams which just consisted of skulls or heads without bodies accompanying me on the research journey and prompting me or pushing me to keep going. On Tabiteuea – our other ancestral island – I was visited by more than a few spirits and on Banaba I definitely had waking encounters with vivid things I couldn't explain but believed were messages, greetings, or acknowledgements. After Kaka (our Banaban grandfather) passed away on Rabi, I dreamt he visited our house in Tabona and spoke with our aunty as I watched from the room. And in 2011, my husband said that a tall man visited him in a dream and said to tell me I could do this book and it would be good. He said it was our American grandfather.

MW: Do you have any funny stories from doing your research or writing the book?

KT: Yes. (laughs) Many of them involve bodily functions which comes with the territory in anthropological research. One of them involves an entire section of

Ocean Island 1900, 'Native Missionary and Followers'. Courtesy of the National Archives of Australia

Betio Town in South Tarawa accompanying me to the shop to buy toilet paper and then sitting outside the school toilet, waiting, while I went. Others involve showering under the stars with some awesome nuns on Tabiteuea only to find out that a toddy cutter was up a coconut tree somewhere in the dark and decided to reveal himself by singing one of those toddy-cutting songs.

A not so funny one was when a drunk young man climbed under my mosquito net in Tekabwibwi, North Tabiteuea, while my two uncles slept not too far away, claiming he just wanted to touch my hair. I woke up while his hand was inches from my face.

Another one was when I thought I could play netball for our village, Tabiang, on Rabi but didn't quite know the rules of the game, and some clever woman put me into a match against the toughest village on the island. I think she wanted to show everyone how no amount of education will help you on the sports field. So I married a former athlete. He played volleyball for Tabiang years later and his team decimated all the reigning champions – first time Tabiang every won a trophy, I hear!

MW: Do you feel you have exhausted the archives on Banaba? Is there more work that could be done?

KT: No, no, no. The archives of the British Phosphate Commissioners and others relevant to Banaba, phosphate and mining are MASSIVE. They're in Canberra, Melbourne, Adelaide, London, Auckland, Wellington, Suva, and would connect to other records such as cargo manifests from many more countries. And this doesn't include the content in private collections of former company employees and that of Stacey King and Ken Sigrah on the Gold Coast of Australia. There is a lifetime of work to be done and I'd love to keep going. I think it would also be great for younger Banabans to study the humanities and social sciences and write more of our histories and contemporary stories.

MW: Well, that will certainly keep you busy! Thanks for taking time to share with us on the microwoman blog. Is there anything else you'd like to say to our readers before you go?

KT: *Tekeraoi* and go microwomen!

Banaba in the year 2000. Photo by Katerina Teaiwa

Reinhold Leinfelder is a geologist and a member of the Anthropocene Working Group of the International Commission on Stratigraphy. He has held professorships at various German universities and directorships at several museums and natural history collections. He is currently professor at Freie Universität Berlin and Principal Investigator at the Cluster of Excellence *Image Knowledge Gestaltung*.

Alexandra Hamann is a media designer who has directed an agency specialising in educational media and science communication since 2001. She is an editor and author of non-fiction comic books. As a freelancer working with the Cluster of Excellence, she was responsible for the storyboard, coordination and editing of *Eating Anthropocene*. She is the mind behind the idea and concept for the comic.

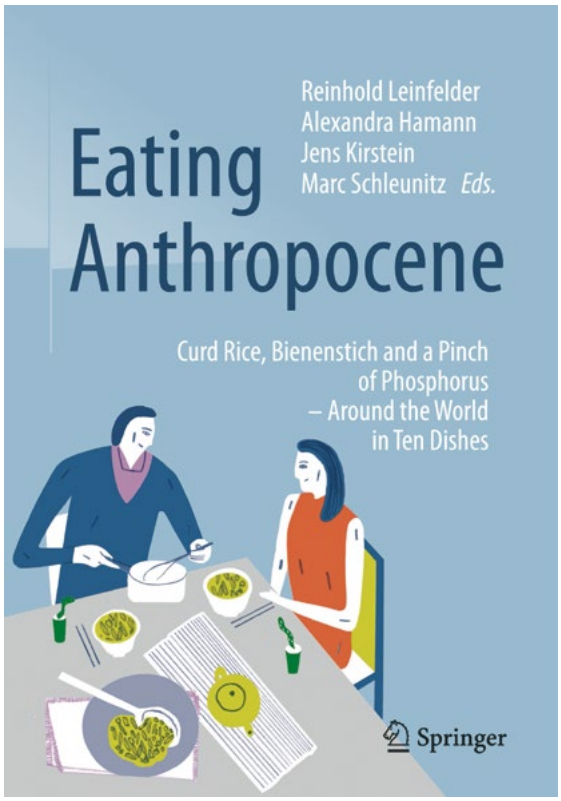
Jens Kirstein is a geologist and research associate at Freie Universität Berlin. He investigates relevant historical, current and future biogeological resource, energy and material flows in and around the kitchen. In addition to his work at the Cluster of Excellence *Image Knowledge Gestaltung,* he is a Ph.D. candidate of the International Max Planck Research School for Global Biogeochemical Cycles (IMPRS-gBGC).

Marc Schleunitz is a biologist and political scientist. His interests lie in the correlations between humans' use and manifold transformation of the environment, their ecological consequences and their underlying economic processes. He works as a research associate for the base project with a focus on researching global nutrition and the material flows and resource usage associated with it.

R. Leinfelder, A. Hamann, J. Kirstein, M. Schleunitz

Epilogue: *Eating Anthropocene* – Merging Science and Comics

The present volume documents the twofold character of the conference *Science meets Comics* with the first part focusing on comics as a format for communicating complex topics and the second part addressing food in the age of the Anthropocene as one such example for complex topics. The overall objective of the symposium was to deal with the results and suggestions of the presentations and discussions, to find possible pathways on how to feed the world in the future and to co-produce the final chapter of the scientific comic *Eating Anthropocene* together with all artists participating in the project. In order to sum up the framing, contents and design process of the comic as well as to highlight its Anthropocene context we below provide a slightly abridged version of the preface of our comic book:[1]



Eating Anthropocene
Curd Rice, Bienenstich and a Pinch of Phosphorus – Around the World in Ten Dishes
ISBN 978-3-662-50402-4, Springer-Verlag, 2016

Editors: Reinhold Leinfelder, Alexandra Hamann, Jens Kirstein, Marc Schleunitz
Illustrators: José Aguiar, Sarnath Banerjee, Zineb Benjelloun, Joëlle Ebongue, Martin Ernstsen, Sophie Goldstein, Samuel Jaramillo, Sylvain Mazas, Ulrich Scheel, Maki Shimizu, Ruohan Wang, Martyna Žalalytė
Website: www.anthropocene-kitchen.com

1 Courtesy of Springer publisher, as part of Springer Nature

Food – life-relation

Food is something that permeates all spheres of our lives. It allows us to grow from infants into adults and supplies our entire system – from our brains and muscles to all other organs and body parts – with energy and essential building blocks. The ritual of coming together to enjoy food is often the central element of our family lives and other forms of social exchange. Indeed, it's rare to have a gathering without some form of appetizer, a birthday party without a cake or something sweet, a celebration without some festive food, or a meeting with a good friend without getting a bite to eat. We integrate nutrition into our working lives, for example by meeting for business meals or networking with colleagues in the cafeteria. The way we eat is closely linked to our health and well-being. And there's good reason we say "You are what you eat". Many of us attach great importance to the layout and equipment of our kitchens, others have only a microwave. Either way, a home without a kitchen remains unthinkable.

The food production process

No matter how we consume our food, it has to come from somewhere and someone has to produce it. This has tremendous global impact, usually without any of us being aware of it. It makes a difference whether we buy our food in a supermarket or in a local store around the corner; it also makes a difference whether the goods are produced in the region or by a global corporation. Manufacturing and processing require a lot of space, massive amounts of technology, immense infrastructure and, in particular, energy. Our food also requires nutrients in order to come into being in the first place. For example, cows eat grass or increasingly soy, which in turn requires surface area, water and, once again, nutrients. These nutrients are acquired by technical means – such as the Haber-Bosch process, which generates nitrogen fertiliser, or from mined mineral resources, such as phosphate and potassium – and used on fields to increase crop yields.

Governing globalisation from the kitchen

Eating has always been and will continue to be a very local, personal and often emotional act. At the same time, when we eat, we get globalisation served pretty much directly onto our plate; we eat fruit, chocolate, spices, meat, fish, grains and vegetables, many of which have come from the other side of the world. In other words, the way we eat and prepare our food can have a significant influence on the course of globalisation. The shape and structure of the world's food supply are determined by our diet (vegan, vegetarian, etc.), nutritional style (seasonal, local, global), social housing structure (a single person has different shopping habits than a family or flat-share participants) and, last but not least, by our actual

kitchens (indeed, pots and pans need to be manufactured and transported, and gas is a different source of energy than electricity or charcoal). The food industry is an important economic factor.

Access to healthy food for a rapidly growing global population continues to be one of the biggest challenges facing the world today. It is also closely connected to topics of health, poverty, justice and peace just as much as to issues such as climate change, the protection of biodiversity and the finiteness of resources.

Nutrition as key driver to the Anthropocene

These issues land us smack dab in the middle of the Anthropocene, the epoch shaped by human beings. In order to understand what is meant by this term, we need to take a quick look back. Our species, *Homo sapiens*, has been around for roughly 200,000 years. During most of that time, we were hunters and gatherers, that is, until a little more than 10,000 years ago when we increasingly started to settle down and farm the land. We've been interfering very deeply in nature ever since. Early farmers created farmland and pastures by chopping down forests, thus plundering a natural source of carbon storage and releasing the greenhouse gas CO2. They flooded fields to plant rice and produced yet another greenhouse gas, methane, in foul-smelling mud. By means of selective breeding and the elimination of all major enemies, human beings were able to pare down the world's natural flora and fauna. In addition to that, ever since they started exploring the entire globe in the early modern era, human beings also began taking species that appeared useful to them and transporting them this way and that, which led to a large-scale reshaping of local ecosystems.

The emancipation of human beings from the limits of their own physical strength progressed even further with the advent of industrialisation. Our ancestors had made do using only their own muscle strength. Animals, too, use muscles in their jaws, tongues and lips to pull down plants and chew, or to catch and shred prey. They dig holes, build nests and even chop down trees. The strength necessary to achieve these feats was gained quite literally from eating. This is entirely different from modern humans, who began delegating their own physical chores to animals, starting with the ox, donkey and horse, followed by water and windmills and later via steam and other types of engines. In turn, these new machines had to be fed with energy, first with wood and then with coal, gas and oil. Over the course of industrialisation, a true chain reaction of mutually reinforcing developments was inaugurated. The conversion of fossil fuels made it possible to mine even more mineral resources with which we could build more machines, which in turn required

even more energy. The result was that the machinery of production and the means of transport, including trains, cars, ships and airplanes, conquered the world.

Today, we don't have to eat more in order to move or produce things. Thanks to the energy derived from fossil fuels, all we have to do is sit at our desks and press buttons. In fact, fossil fuels represent nothing less than the preserved energy of living things, such as trees, shrubs and sea plankton, which are not eaten by other beings, but instead accumulate over the course of hundreds of millions of years as geological processes convert them to coal, oil and gas. Even resources like the majority of iron ore deposits, or the phosphate so essential to our diet, can be traced back to the natural processes of organisms.

Human beings are having such an enormous influence on the entire Earth system that geologists now describe them as representing an essential geological force in and of themselves – one that is comparable to earthquakes, volcanic eruptions and continental shifts. These are strong words, but the facts speak for themselves: today, barely one quarter of the Earth's surface that is not covered by ice remains in a state undisturbed by human beings. We have taken down mountains, created valleys, given rivers a new course, carved out lakes and let other ones dry up. We can even raise the sea level and change the climate. Each year we produce an amount of plastic equivalent to the total mass of all people alive on the planet today. Our crops and farm animals dominate the biosphere. We bundle off sediment in ways that nature could never achieve via its own erosion and transport processes. We've even created new fossils! Geologists call them technofossils: plastic particles found today at the bottom of high-mountain lakes as well as in deep-sea sediments. In fact, elementary aluminium, concrete fragments and ash particles from industrial combustion processes are detectable in deposits all over the world. Radioactive fallout from post-war atomic bomb tests, as well as from Chernobyl and Fukushima, also defines our "man-made new", which is the literal translation of the word Anthropocene. The post-glacial age of the last 12,000 years, the environmentally stable Holocene, is visibly at an end – and is being replaced by the Anthropocene.

Shaping the future

How will things continue in this Anthropocene era? Doesn't the terrifying realisation that human beings are capable of redesigning the Earth to such an extent also give us some idea as to possible solutions to the problem? In an era in which not only the destruction of the environment has increased exponentially, but also our knowledge about the underlying processes that are causing it, shouldn't we humans be capable of shaping the Anthropocene in a knowledge-based manner – like

careful gardeners – so that the planetary boundaries of the Earth system are not endangered? Perhaps we could see ourselves as part of an overall system we need to preserve? There's a reason why the metaphor of the gardener is so appropriate in this case; indeed, gardeners who want to continue to harvest crops know they must maintain their soil without overusing it. In a similar vein, those who want to live on this Earth over the long term cannot continue to exploit it. We must instead shape it in such a way that human behaviour does not destroy our own home.

But how should we behave? Or, with regard to our topic, how should we eat? How can we consume food without losing our joy of eating while also keeping ourselves and the Earth healthy? From a global perspective, we continue to have a highly varied culture of food and eating. Perhaps the solution lies in this diversity. In order to find good ideas, we have to look very closely at the world around us. Indeed, *Eating Anthropocene* is an attempt to create a cartography of eating habits on a global scale – based on examples taken from different countries and in a manner that is as open as possible. Most importantly, this approach is based on real human beings. Knowledge-based gardening needs to take into account more than just scientific evidence. Science is an important factor, but it's not enough. We need to collect experiences, regardless of whether they come from centuries-old traditions, new food fashions or the need to combat famine.

Dialogue and diversity

So we asked ten individuals from ten countries on five continents to tell us what and how they eat, but also where they shop, whether they know where their food comes from and what role the kitchen plays in the whole thing. They told us their favourite recipes, which served as anchor points for the discussions and are now contained in the comic book for you to try out on your own. The results of this process served as the starting point for our scientific research. Over the course of our constant exchange, charming stories began to crystallise little by little, and we invite you to experience these adventures , in which each chapter features one of our discussion partners in the lead role.

One element – and in this case it really is an element – that connects one chapter to the next is phosphorus. Phosphorus compounds are not only essential for all life on the planet, they also constitute – in the form of phosphate – one of the three main ingredients in all fertilisers. Phosphate increases global agricultural yields many times over and has enabled the feeding of a rapidly growing world population. Its meaning as a finite and non-renewable resource is something many people are unaware of. We would like to change that state of affairs, which is why

phosphorus and its many facets represent the thread running through all of the journeys undertaken in *Eating Anthropocene*.

Upon reading, you will also encounter yet another entirely different type of diversity. Indeed, your eyes will be the first to notice that the visual representation of the stories is marked by tremendous variety. Who better to depict the lifestyles, environments, eating habits and everyday lives of our protagonists than illustrators from the regions in which the stories take place? Twelve artists took on the challenge of this exciting project and faced the task of translating scientific facts and individual experiences into image-based stories. Each one of the completely different styles and perspectives enriches the book and reflects the cultural diversity of our protagonists. In turn, we would argue that it also reflects the diversity of the entire world.

Greetings from the future

After the artists completed their individual chapters, we brought them all together in a workshop for the purpose of creating the last chapter on the future of food. After discussing the future of the world's food supply with international experts from the symposium documented in this volume, the artists came up with a unique way to reflect the prognoses of their deliberations: they decided to take the protagonists of each chapter on a journey into the future, and to a different country. From that vantage point, each protagonist sends a postcard in which they report about life and nutrition in the year 2050. Perhaps those postcards – and the comic in general – will provide you with some ideas as to how you yourself would like to shape the future. In addition to the delicious recipes found in *Eating Anthropocene* we hope we also give you, together with this present volume, some food for thought, and for fruitful discussion.

The knowledge comic *Eating Anthropocene* is the result of a global experiment involving many participants and conducted in a manner that uses the world as a laboratory. One could also say that the mother of all laboratories is the kitchen, and our eating habits in the Anthropocene is the outcome of the experiments performed there. Perhaps the best way to show our love for our planet is through our stomachs.