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Science meets Comics

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

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Ein Interdisziplinäres Labor

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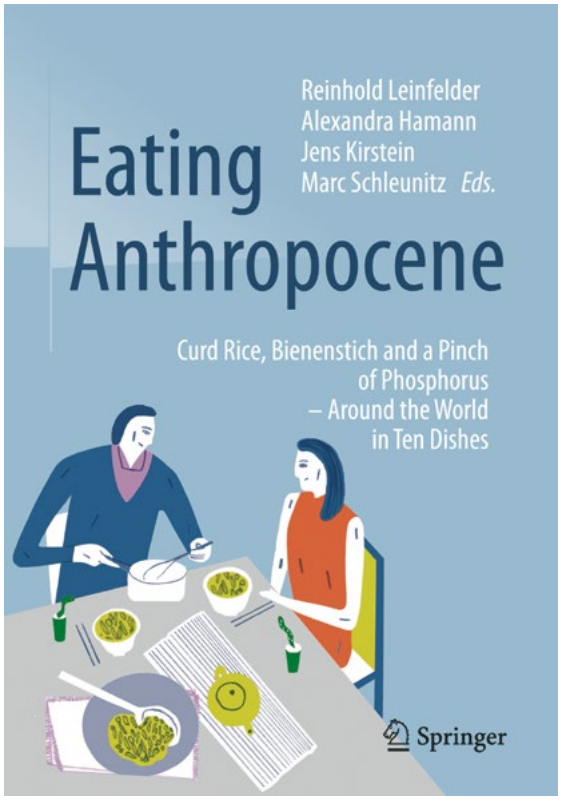
Epilogue: *Eating Anthropocene* – Merging Science and Comics

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.

There are no simple solutions in the Anthropocene epoch. Every single person lives in a highly complex system and is connected to it by his or her actions. By focusing on the example of alimentation, this interconnectedness can be exposed and presented in a form that everyone can understand. Comics as a communication medium not only have the potential to make complex issues accessible in an appealing form; the comic-making process itself can inspire scientific work, and reveal new connections.

This proceedings volume includes contributions on alimentation and comic theory by Jaqueline Berndt, Anne-Kathrin Kuhlemann, Toni Meier, Veronika Mischitz, Stephan Packard, Lukas Plank, Nick Sousanis, Katerina Teaiwa and Arnold van Huis. It is the result of the two-day symposium *Science meets Comics*, held in October 2015 in the Cluster of Excellence *Image Knowledge Gestaltung. An Interdisciplinary Laboratory* at the Humboldt-Universität zu Berlin, which discussed and developed these new means of communication in relation to alimentation.