A Curriculum for the Anthropocene

HAUS DER KULTUREN DER WELT

DEEP TIME
CHICAGO

DEEP TIME CHICAGO is an art/research/activism initiative formed in the wake of the Anthropocene Curriculum program at HKW in Berlin, Germany. The initiative's goal is to explore one core idea: humanity as a geological agency, capable of disrupting the earth system and inscribing present modes of existence into deep time. By knitting together group readings, guided walks, lectures, panels, screenings, performances, publications and exhibitions, we hope to develop a public research trajectory, offering a variety of formats where Chicago area inhabitants can grapple with the crucial questions of global ecological change.

DEEPTIMECHICAGO.ORG

DEEP TIME
CHICAGO

A Curriculum for the Anthropocene

HAUS DER KULTUREN DER WELT

A Curriculum for the Anthropocene

The Anthropocene is a concept in flux and therefore any approach to it must be adaptive, exploratory, and navigational. Appropriately enough, the term *curriculum*—in its original Latin referring to the course in a race—figures the type of pathway we hope to follow. This course-making is not only about acquiring knowledge. It also cartographically implicates zones to pass through, conceptual beacons with which to guide the movement, and, most importantly, methods and strategies that enable one to make these moves. The curriculum is an attempt to form bridges that allow us to go from contested ideas to the concrete conditions as we confront them in the Anthropocene, giving shape to a "curriculum" in the complete sense of the word: running the circuits of epistemic and aesthetic loops that envelop the techno-cultural existence and operation of this world.

The core premise of the Anthropocene hypothesis is that we already are in a "geological age of humanity," an age of anthropos' making. This has obvious consequences, requiring human beings and their societies to reflect on how they have affected and will continue to affect both the planet and each other. Humans are no longer just cultural actors in front of nature's static scenery but have instead entered into a multifaceted dynamic of entanglement unfolding on highly unstable ground that endangers the co-existence of humanity and nature. The industrialized human—as geological force—elicits the fragility of the planet. And if we, as humans, are the most intensive agents of this age, then a whole slew of ethical and agential questions must be asked

as to our role, namely: How can our cultures, our societies, our politics, our economic structures, or our forms of life manifest and adequately address these shifts across environmental systems, across biogeochemical cycles, and across geohistorical timezones?

Given the gravity of our collective impact on the Earth, the Anthropocene and any curriculum adequate to it must address these pressing demands in their inherent complexity. Given that so many elements are interwoven, our own human knowledge practice will need to explicitly work within the constraints of Earth systems, collapsing distinctions as to what is anthropogenic and what is not, while delicately managing the new ethical questions that emerge along the way. The Anthropocene dictates that human action is Earth action and vice versa, and our approach to the production and practice of knowledge needs to reflect that fact.

Since its initiation in 2013 by Berlin's Haus der Kulturen der Welt (HKW) and the Max Planck Institute for the History of Science (MPIWG), the idea behind the *Anthropocene Curriculum* project was to incubate and test cross-disciplinary explorations of this new terrain. This means composing an experimental space of co-learning and co-producing in line with the new entanglements and pressing demands of the Anthropocene. In effect, the project sees its direct role as a space for modeling approaches to knowledge and its production that can rise to the challenge of the Anthropocene, addressing planetary complexities in an exploratory manner and constructively responding to their dynamics.

The Anthropocene predicament offers the opportunity to make previously uncharted, transdisciplinary connections apparent and to experiment with new forms of navigating the spectra of issues defining the age. We must approach knowledge and its production in a novel way that embodies and traverses planetary complexities and helps to create social-epistemic formations that can carefully act on it. Conceptually, this introduces a remarkable context shift in how we understand humans and their relation to the Earth system. Practically, it has important implications not only for the (Earth) sciences but also for the humanities, design, and the arts.

The general aim of the *Anthropocene Curriculum* is to transform interdisciplinary exchange into an operative tool and catalyze active collaboration between research and education. Beyond the obvious benefits of sharing

and collaborating, the mandate of the curricula is to create new forms of education that involve various social, scientific, epistemic, and political reconfigurations. It suggests that these are absolutely necessary for knowledge production in the face of catastrophic changes that affect the Earth—with its many spheres and inhabitants—asymmetrically yet ubiquitously, across species, materials, and agencies. This search for novel forms of problem-driven research and education is particularly linked to current debates around the shifting roles, means, and institutions of higher education (such as curriculum reform, higher education infrastructures beyond the university, etc.), but its aims are more widespread. While we encourage the integration of cross-disciplinary thinking, mutual learning, and civic commitment in the curricula of universities and research institutions, we also envision an entirely new epistemological horizon. The *Anthropocene Curriculum* project thus addresses a qualitative shift in conceptualizing and framing knowledge, its devices, methods, and institutions, by productively imbricating the plurality of knowledge within an experimental educational setup: a plurality that explicitly bridges different models of knowledge (institutional or otherwise, spatially distributed, and situated), inserting them into novel *milieus* of collaboration rather than into a mere relativism of perspective.

With the *Anthropocene Campus,* of which two editions were held in 2014 and 2016, we established a particular format in order to field test a diverse set of topical research projects, methodological approaches, and knowledge practices within the shared space of HKW. We hosted different sets of seminars that could serve as exemplars for future curricula and we explored, discussed and further developed their general feasibility within a larger group of committed researchers and artists. The hope was that this could offer an unrivaled opportunity to work out a design for knowledge building and knowledge transfer that would be appropriate to the epistemic and educational challenges of the Anthropocene.

The public nature of this undertaking is certainly one of the main assets of the experiment. The peculiarity of its home institution, the Haus der Kulturen der Welt (HKW)—neither an academy nor a generic art institution but rather somewhere parallel to those worlds—opens a middle space, leaning on other discourses and their communities while being outside of their institutional, epistemic, or curricular constraints. We therefore see HKW as something of a laboratory in which these practices can unfold in experimental forms, working with and from the knowledge sets that feed their momentum. Yet the

goal of the project is to move past this site-specificity and explore how similar models could be transposed into other contexts and operate at multiple scales, possibly in firmer or more lasting configurations. Whereas HKW continues to provide an important hub for the project, the aim is now to unfold its potential in other institutions and other locations around the world.

Through the years, the *Anthropocene Curriculum* project has expanded to an international network of people and institutions, working through these ideas and models on their own terrain while enriching the project's scope and applicability. These bridges have been invaluable in fostering such an undertaking and will provide a scaffolding into the future as we collectively pursue these experiments.

Mapping Concepts

> *"It has become increasingly difficult for, say, a historian to speak with an ecologist, or a sculptor to speak with a physicist. If we are to make a common curriculum work for something as cross-disciplinary as the Anthropocene, then we have to address this problem. One way to do it is to provide a glossary of vital terms from all disciplines for the Anthropocene."*
>
> —Jan Zalasiewicz, geologist

In the process of developing an experimental *Anthropocene Curriculum,* a selection of foundational concepts is important in order to build a common ground and to embark on a collective pathway. We have therefore laid out a series of key terms to be negotiated for the curriculum, concepts that remain contested but can still be used as navigational beacons along the way. They offer a chance to orient the general conversation so that we can productively grapple—in a heterogeneous yet unified direction—with the questions and terrains that lie ahead while leaving space to articulate novel reconfigurations that could change the overall course itself and, and, by that very virtue, capture the dynamics implicit in such a project.

Presented here is a collection of these key concepts set as anchors placed alongside quotations from participants of the Campuses. This starting point may allow us to bridge our concrete experiences of pathfinding within the general trajectory mapped out in the concepts. Coming from scholars of various disciplinary backgrounds, these quotations provide direct insights into the actual experiences of the collaborative process during both *Anthropocene Campus* in 2014 and 2016 and the exploratory and experimental process of the larger *Anthropocene Curriculum* project.

Scale

One of the central challenges posed by the Anthropocene is to apprehend, understand, and bridge the multiple spatiotemporal scales involved when speaking about the Earth system. From macro- to meso- and micro-, scale is a notion that goes beyond measurement alone, but also addresses the sensitivities involved in perceiving, communicating, and capturing size, scope, and duration. Space and time seem to curve dynamically, creating a contradiction between what we generally understand as “near” and “far,” “slow” and “fast.”

Human activities and their impacts are no longer scaled to the measure of the human. The growth and shrinking of economies, cities, and populations has intense environmental, indeed geological, ramifications. Scaling the scales appears, then, as a hotly contested political arena for the composition of adequate knowledge-forms. With what mindset, or indeed, with which combinatory devices, can we address, interpret, and act within multiscalar dimensions?

“How can we combine the temporalities of the human, or national, local, individual life forms and practices—and politics –with the one(s?) of the Anthropocene?”

—Sverker Sörlin, environmental historian

“When we talk about the Anthropocene or climate change and we talk about human beings using fossil fuels, there is a collision. Analytically, in our thinking, these different histories come together; histories that happened on different scales, at different places, suddenly come together, like e.g. the production of fossil oil as a geological process and the exploitation of oil by humans in a very short time. And the collision is happening in the outside world, where small human actions (…) are causing huge changes at a planetary level. Thus the collision is happening at two levels: one is in our thinking and the other is outside in the world.”

—Dipesh Chakrabarty, historian

Model

The Anthropocene would be practically inconceivable without models. Though possessing a wide range of practical meanings—from physical scale models and replicas, to quantitative or descriptive models of collective behavior, to numerical models of climate—models are the heuristic backbone of our knowledge about systems and change, cause and effect, physical interdependencies, and the processes that interconnect entities. Hence, models (together with data) play a central role in the natural and social sciences, technical crafts and engineering, urbanism and architecture. It is therefore only logical that they have also taken on a role in virtually every seminar of the Curriculum.

A model usually has a practical purpose and is tailored for type-dependent problem solving. Generally speaking, models are characterized by simplification, abstraction, and mimesis. Their aim is to be robust and general. Models provide an approximate understanding and are a solid basis for planning, informed decision-making, and making otherwise complex structures graspable.

"Representations are guiding our actions. And some of the agencies of the world can be captured by models. It is important to teach natural science students that real systems are more complex than the models, but it is also important that social science students know about modeling."

—Pablo Jensen, physicist

"Models are not just representations of the world, but platforms for an adaptive engagement with changing environments and understood as tools of self-instruction and collective learning about complex systems and their possible future trajectories. They structure language, coordinate people, and help to make robust decisions that help ecosystems to retain resilience."

—Isabell Schrickel, media theorist

Agency

The "Age of The Human" raises central questions for philosophy and jurisprudence concerning who or what has or holds agency in the Anthropocene. When non-human entities—such as carbon dioxide, stock exchanges, or planetary technologies—are powerful enough to restructure societies and affect human legal representation and responsibility, an appropriate modification of how accountability is conceived becomes critical. With such grave consequences posed by actions and agents within the state of transition the Earth system is undergoing, the distinction between intentionality or unintentionality is often blurred beyond clear definition.

Appeals for a "natural contract" as a necessary update to the social contract of the Moderns, or calls for a convocation of a "parliament of things" are commonplace within the humanities. Yet despite these conceptual propositions, urgent questions remain. Who or what counts as a subject? Who and what constitutes a political body? Who speaks for whom? How can an epistemology of agency re-imagine not only the register of the subject, but the ethical entanglements of activity? How can jurisprudence adapt its codes, forms, and procedures to reflect the multi-agential realities of the Anthropocene? How can representation beyond-the-human be comprehended?

"The concept of the Anthropocene is premised on the fact that humans have been causal agents on a planetary scale. The question is, given that we've had that effect, what kind of new causes can we be, what kind of agency can we bring to it? This question of understanding, of shaping the metaphor but also like shaping land, shaping the air, shaping our representations to ourselves and to each other about what all of those things are..."

—Andrew Yang, artist

"Who is this anthropos? Who is the 'we' in the Anthropocene? An emphasis on humans as a species can hide differences in power, class, and gender. We need a re-politicization of the Anthropocene, a re-politicization of nature!"

—Marco Armiero, environmental historian

Complexity

Complexity is, without a doubt, a more than appropriate term for the Anthropocene. The interconnection of entities, places, agencies, and times is a strong conviction across the disciplinary board when it comes to the world today. Thus, it has become difficult to imagine a system that is, indeed, non-complex. Problems tend to become ever more wicked, solutions ever more tentative and short-lived. There seems to be a general limit not only to understanding but also to the forms of representation itself.

Physical non-linear systems, societal complexity, co-evolution of socio-epistemic formations, intricate feedback loops between the material and the mental, econophysics, city planning, post-modern Babel—indeed, much of our contemporary knowledge forms bear a resonant affinity to this term. Could there be an anti-complexity backlash? Might the complexity of complexity eventually nourish a longing for easier solutions and reductive or clear-cut worldviews? Can knowledge remain content with non-optimal solutions?

"I'm all for reductionism. It's the basis of science and there is one big confusion about complexity, that it is not reductionist. Complexity theory is currently the most reductionist theory that we have, that's maybe why it's the most promising theory. It's a reduction of a different kind. It's not a reduction to its component parts and a smaller scale, it's a reduction towards the discovery of fundamental principles of those complex systems, but it's reductionist nevertheless [...]."

—Jürgen Renn, historian of science

"We must seek remedies because just stating that problems have no solution is not a solution. However, in the Anthropocene we are facing 'wicked problems' without a single answer. What counts as a solution depends on how the problem is framed and vice versa—and who is speaking."

—Miriam Diamond, chemist

Socio-ecological Design

When the Earth itself emerges as an object of design within the Anthropocene, the mandate to (re)construct socio-ecological systems may be seen as the aesthetic project par excellence. The hard and soft infrastructures we build, the political negotiations we undertake, the anthropogenic natucultures we observe spreading all around us, confronting our notions of environmental stewardship: these are all figurations and compositions that have an innovative, indeed, generative dimension. Under the auspices of the Anthropocene, the Renaissance notion of *disegno*—the drafting of nature—reinvents itself, but as what? As a question of form? As an application of genesis?

Doesn't human enacted "design" contradict the basic premise of evolution—that resilience emerges out of slow mutation and adaptation, rather than through manual-conceptual intervention? How does design deal with complexity, that is, how does its practice readily adapt to non-optimal, yet resilient, solutions? If the Anthropocene proposes a mutual set of autogenerative agencies, is there an "outside" to its designer drive? And finally, in relation to our immediate concern of education, what do these questions imply for the design of learning environments and curricula?

"Design is [...] an integral part of our being. We use design not only in our own everyday lives but also in our individual and collective approaches to progress in technology and in navigating in our physical and psychological worlds. The question is: How can our processes in designing and managing our world be constructively destabilized? How can the linear processes of planning in accordance with a perceived status quo be disrupted?"

—Bryndis Snaebjörnsdóttir, artist

"Material flow analyses and ecological footprint accounts constitute nature as another form of value: a resource; a consumer good; a risk. What are the consequences of such tools? Is planetary control the most promising goal to pursue, or do we need to think about other forms of social-natural interaction?"

—Sabine Höhler, science and technology historian

Participatory Governance

Many seem to share the opinion that for a soft landing into the Anthropocene, any response taken to the crises at hand must be legitimized through democratic procedures of power. This is, no doubt, a huge challenge, even if only because of the complications of democracy itself. How can a concept, originally developed within the operational context of a localized city-state, be translated to scales that contain multiple geographies and subjectivities, that is, to the scale of the planetary? The concept of "power of, by, and for the people" not only challenges and is challenged by an extended notion of agency, it also stands in the midst of often radically differing epistemologies, political determinations, cultures, species, and ideals. With so many agencies convening in collective governance, how is it that our collective ideals and responsibilities can be maintained peacefully and democratically?

A society resting on broad participation, commitment, interest, and active involvement is rare. Who participates and who delegates participation? What is the role of leadership? Who takes responsibility for decisions? How can we re-address notions near and dear to the ideals set forth by democratic values—participation, engagement, consensus—to take into account multi-layered processes and variably distributed stakeholders? Do we need different—or even multiple—models of governance? Must we tap into other non-political orders of alliance, affinity, and relationality?

"Who counts as an expert? What constitutes scientific authority? I'd like to strengthen the project's commitment to democratizing the dialogue to include other knowledge producers, placing the scientists along with many different kinds of citizens."

—Amita Baviskar, sociologist

"What does a modern university do? It adds a new geological layer to planet Earth. By collaborating with corporations, governments and the military, university scientists help create the technology that drives the era of anthropogenic climate change. And by devising organizational forms, managerial schemes, logistical processes and financial innovations, academics help speed up global industrial production, intensifying the Great Acceleration that began after WWII. But that's not all the Cities of Knowledge can do. As humanity wakes up to its new role as a geological agent, universities may shift large parts of their formidable invention power toward the limitation and mitigation of climate chaos."

—Brian Holmes, art and cultural critic

Earthly Ethics

At its core, the Anthropocene commits the practice and understanding of human ethics to the unprecedented proportions and dynamics of the epoch. The entire physical scale of the planet—from the individual to the global—is compressed down to questions of conscience, responsibility, and empathy. This ethical reorientation extends not only for and towards one's immediate neighbor, including the next proximity along the scale (for example, from family to community), but also to the very remote human, or non-human, entity. Modernity seems to have interrupted long-held principles of spatio-temporal ethics, defined by an integral continuity between past and future generations, as well as a clear positioning within an immediate environment.

It appears that intergenerational sustainability efforts and future stewardship as well as interdisciplinary and intercultural interconnection all become key issues once more, driven by a renewed need for the care and concern temporarily halted by Modernity's claim to master both time and space. What kind of ethical values does the Anthropocene demand? How can local virtues and universal laws co-inhabit within an ethical paradigm? How do the diversity of cultural predispositions and scientific authority—with its universalizing purview—come to occupy shared spatiotemporal coordinates?

"Ethics are at the core of the Anthropocenic issue insofar as they formulate a frame for human action which is considered as an action of free will. We need to find new forms of ethics in order to come to a new step of civilization."

—Philipp Oswalt, architect

"[...] we are coming to realize that there can be no fair human society without the long discarded and discredited term 'ethics.'

"However, introducing ethics is not only about human societies, it has to be about the idea of the non-human as well. 'Human interest' has to include the 'non-human' not only for human futures, but as an idea of equity itself. We need to make 'nature' political, but not only in the way it has been so far, i.e. as a politics of resource use, but in a new way—as a politics of a planetary future."

—Ravi Agarwal, artist

Experimentation

To what degree does experimentation play a role in the shifting of perspectives and the creation of solutions necessary for the Anthropocene? Experimental methods—whether scientific, artistic, or otherwise—are not a virtue in themselves, yet they can aid in the way we deal with the dynamics of the age; they combine different scales of effect, and they multiply sources of resilience. The Anthropocene confronts us with an array of known-unknowns as well as unknown-unknowns. Our learning is a process of entering while simultaneously acting and generating the new epoch. In order to support the adaptation of societies to such a future-now, one certainly needs to designate clear and defined spaces for free interaction and wild modeling. This enabling of experimentation creates room for maneuvers that respond appropriately to dynamic situations, showing alternative pathways and possible futures.

If experimentation is on its way as a standard for generating knowledge forms, then what will future experimentation look like? How to resist stasis, how to keep knowledge fresh and responsive, how to control the systemic tendency towards an eventual "orthodoxy?" In our time of rapid transformation, we cannot afford to rest upon our laurels. How, then, can we nourish creativity, play, and spontaneity when faced with such a test of endurance?

"What we're doing in the campus might be called [...] experiment ludifera, the experiment of play, as a site of radical novelty where we try to be effective in the world but without trying to reduce the world to a set of laws and fundamental components. But can it become more than that [...] by being embedded in wider new patterns of knowledge production [...] where natural scientists, artists, and philosophers work together over a much longer term?"

—Bronislaw Szerszynski, sociologist

"[...] amid the many ways of expulsion that have accompanied the rise of technosphere, capital and governance, what questions can experiments pose that can enable us to make connections differently? There are so few spaces in a university where connections can be made; universities specialize in reductionist knowledges [...]."

—Lesley Green, anthropologist

(Un)control

In the Anthropocene, control becomes a question of who, or what, is the mover of things and how control itself is even understood. The processes which stabilize, form and direct control (as well as uncontrol) begin to look more like an infrastructure of interactions in such a sea of complexity; instaurations that form and shape interactions more than any explicit agenda being implemented. These interwoven systems can be a manipulated or have a life of their own, making the whole idea of control more complex than a single agent cause-and-effect model and more a question of infrastructure and its implementation. The modern illusion of mastery, of governing a system established between actor and bearer, seems long gone. Everything is constituted through intra-actions, which are, by principle, contingent and uncontrollable. Nevertheless, control is sewn into the entire fabric of the technosphere at a fundamental level; mandating where its armatures function, and how its information flows. In every piece of infrastructure, in every line of code, the necessity of control is more alive than ever. No engine, no device, no bureaucracy, no software works without control systems. How can we resolve this paradoxical divide between the micro and the macro architecture of the technosphere?

This cuts into the heart of ethical and political issues concerning how optimization of a system is ascertained. Not to mention those many questions that ask if control should be implemented at all and, if so, when, by whom, and for whom it is appropriate. As our understandings and facilitation of complex system strategies continues, these questions will only become more critical as we negotiate agency in its complex infrastructural roles.

"Peter Haff suggests that the technosphere is not subject to any type of human control and is thus autonomous.

"I would intervene saying that control and autonomy are not the same thing. If [the concept of the technosphere] is going to be a metaphor that is useful at all, we'll need to find a way in which human will and human action actually make a difference. We cannot just look at this as though we were aliens from the outside, we have to incorporate our subjectivity in the fact that we are inside this thing as part of the way we deal with the technosphere."

—Gabrielle Hecht, historian of science

"Understanding the nature and trajectory of the human response to the Anthropocene is essential to carrying out Earth system science. It is as important as the radiative forcing of carbon dioxide, the circulation of the oceans, or the control of Earth's great element cycles by the biosphere. It is also essential to inform the developing societal narratives around the question: just where on Earth is humanity going?"

—Will Steffen, Earth system scientist

Metabolism

Once a cornerstone of the life sciences, the term metabolism now appears to be applicable for a whole economy of transformations, translations, and distributions of energy and substances throughout many spheres and scales. With the process of individuation lying at the intersection of consuming and being consumed, metabolism could be seen as the process in which an organism, a planet, a body, a cell, a network, an environment, or even a social structure can function and develop itself by taking in, processing, and taking out what it is not. By ingesting, digesting, integrating, parasiting, exchanging, and excreting, metabolism points to that dynamic ability of creation by incorporation. Not only does such dynamic interaction make the distinction between animate or inanimate objects, between bodies and environments, nearly impossible to untangle, it also qualifies the properties that each of those relationships engenders.

Yet the cycle of creation through intake and outtake is highly perturbed through linear consumption strategies of industrial societies, with its life-sustaining properties replaced by pollution, exhaustion, and other maladies of the unsustainable. The dynamic and relational force of the "biogeotechnochemical" swirl of the Anthropocene is of course rife with ethical questions: How much agency is there in human relations within metabolic processes? When does the parasite exhaust the host, or the host exhaust the parasite? Could geo-cannibalistic processes of industrial manipulation metabolize into lithotrophic monstrosities?

"If you're going to take the technology you'll also have to take the waste materials, the consequences, that whole apparatus. You can't just take the human dream and say: that's the technology. Any technology has parts of it that have histories beyond our control."

—Anna Tsing, anthropologist

"The idea of metabolism is that it consumes energy, produces waste, transforms materials but it also creates and uses information. A lot of that today is simply discarded as waste, but increasingly we are seeing reuse of information [...]. [There is] a possibility that that process might contribute to reducing the energy and material requirements of the technosphere."

—Paul N. Edwards, historian of technology

Ecologies

The Anthropocene compels us to formulate the array of complex interactions between biological, technological, and social entanglements—and the circulation of matter and energy through them—as "ecologies." While human and non-human ingress into natural systems denaturalizes their dominion, anthropogenic systems become deculturalized at the same time. Ecological thinking thus requires acclimatization to the idea that parts become participants; subscribers without boundaries to a cyclical complex of constant exchange processes, fleshing out zones of abundance and distributions, being adaptive and striving for resilience. Ecologies are thus a way to describe the formation, profiling, and maintenance of capacity.

Our task will be, thus, to formulate what the multitude of ecologies could be, how their energetic exchanges are transmitted or exhausted and how they are, in effect, co-designed through the incursion of biology and technology, marking niches, heat islands, enclaves, bunkers, microbiomes, and, eventually, an entire planet for organisms, whether these are deemed biotic or abiotic. Certainly, this asks the question as to what exactly should be included in such a catch-all term. What counts as a participant in any ecological sphere? In the end, it is the conditioning quality of these spheres that has an impact on the ability to strive and survive within them.

"With an exploration of historical and prehistorical human ecologies we could lay foundations for a post-natural human nature. Which strategies should we adopt in our engagement with landscapes: stewardship, design, or emergence?"

—Erle Ellis, landscape ecologist

"The question today then isn't how we can conserve 'the' environment. Today, more than ever, 'environment' and 'ecology' need to be radically separated from a modernist idea of 'Nature,' something that is taken to be simply there, for 'Man,' to use or not use and conserve, which is an idea that is not a small part of the problem earthlings face today. The question for each being should instead be how it desires to shape its environment."

—Melanie Sehgal, literary scholar

Sensing

Sensing is the operation that connects us to the world and the world to us. It is also what connects the technosphere to the world and the world to the technosphere. When everything is mediated through information, digital or otherwise, does the distinction between sense organs and sensors, between biological sensation and sensing technology, blur? Data has become not only a *sine qua non* for knowledge acquisition but also, increasingly, a potent means for perception and experience itself. Under these conditions, one might say that the bond between the human and non-human seems to rest on sensory data.

Yet one senses an intangible fear in current society. We are afraid of losing our autonomous means to perceive, of losing our capacity to see and sense "with our mind's eye" and have it "all watched over by machines of loving grace." But is that truly what is happening? Or are we in the process of making possible a new sensorium, one that is better adapted to the dynamics of the world as it? Can bodies and circuitry combine to experience what was formerly imperceptible? Can remote sensing augment our proximate senses to better actualize our experience of living on this planet?

Sensing has its own politics. It will depend on how we construct, train, apply, and critically engage with this new sensorium if we want to change the current structure of power and its obstructions. It is a call to re-forge a sensibility toward the Earth and to embark on a new education of the senses—what we might call a "sensible education."

"The technosphere presents us with many challenges that are inseparable from our capacities to sense: can a more genuine openness to non-human agency and aesthetics usurp human exceptionalism? How would this openness affect what it is possible to sense and what implications would that have for creatures? Who owns and controls sense-data, and is it possible that a more sensitive human is what the technosphere increasingly requires? "

—Sasha Engelmann, creative ethnographer & Jol Thomson, artist

"The diagnosis of the Anthropocene is unthinkable without the data from the technosphere's sensorium, most importantly data from satellite remote sensing collected by the Earth sciences. Thus, the same technological developments that resulted in the enormous impact humans have on the planet are essential for our perception and understanding that we are part of a global force, which can drive the Earth system out of the safe operating space of the Holocene. But how do we relate to the data that mostly goes beyond our everyday experience? How does this influence our decisions, which are based more and more on complex algorithms and sensory data from machines? And ultimately, will the technosphere's sensorium help us to change the way we connect to our planet?"

—Finn Müller-Hansen, Earth system scientist

Techniques

The technosphere is not only an assemblage of technologies, but it is also an assemblage of techniques; that is, it collocates the culturally inflected procedures, practices, and routines, as well as the habits of envisioning, fabricating, processing, arranging, recycling, or tinkering with matter and forms of energy, that are all reified in technology. Techniques are defined by their requirement of certain instruments and standards. In the end, it is these techniques that produce the world we live in.

It is thus necessary to rethink the ways in which we employ and design these techniques, and the ways in which we train people to utilize them, if we want to change the current predicament of the Anthropocene. In the Anthropocene, science and politics work together to perform constant emergency surgery on unsolvable "wicked problems" and unfinished transformation processes. How do our techniques of knowledge function in this critical area of the preliminary, the unconsolidated, and the interminable? Given that knowledge itself is embedded in socio-technical ensembles, what approaches do we take to understand our current training regimes and modes of inquiry, our techniques of mental cultivation and other anthropotechniques? In the end, does knowledge in the Anthropocene rely on a new "wisdom" that engenders rather than encompasses a meaningful world consisting of inventive and open-ended exercises concerned not only with facts but with newly ingrained habits of sensing, feeling, and acting?

"Technique is knowledge incorporated: multiple knowledges obtained with different strategies and projected into the unique experience of the learner whose position and techniques are dependent on the cultural, personal, and political positioning of the learner's affects, the meaning, and the semantics of technique."

—Elena Bougleux, cultural anthropologist

"So technology was always inscribed in nature, and nature controlled this difference. Technology played its role within the metaphysical frame of a teleology of nature, or what we might call occidental teleology. What happened in the 20th century is that there occurred a certain re-evaluation of the difference of techniques and nature, and now the side of technology starts to control the other side of the equation. That's a really interesting historical move; this is the technological destruction of occidental teleology and I think the whole nature/technology difference—the whole struggle with this difference we're experiencing under the title of non-modernity—has to do with the re-evaluation of this difference, and within this difference."

—Erich Hörl, media theorist

Spheres

An envelope of the Earth. An ancient and fertile conception of the cosmos and our own place and situation in it—from Pythagoras to Johannes Kepler to Vladimir Vernadsky. The shift in meaning couldn't be greater: once a reference to an ideal geometric figure of Euclidean space, a harmonic surface spanned by the same distance to a central point; today a functional description of a complex and integrated metabolic system, an endless circulation of energy and matter through shapeless domains, or spheres. Moreover, every one of these messy spheres intermingles with every other. Where does the gaseous atmosphere end? Where is the hydrosphere absent? Where is the planet not influenced by the biosphere? Where is the technosphere not at work?

How do we approach, let alone construct, this paradoxical notion of a shapeless sphere, not to mention the idea of many spheres blending together? Is it Gaia? Or is it an ecosystem spread over the entire globe? Is it a pure material or energy budget variation over time, calculable in terms of metric tons and exajoules? Is it a matter of socio-ecological design, where the sphere is actually created through intervention? Is it a topological space, a network of relations without any fixed point anchored in the center? Is it the opposite of a sphere? The Anthropocene seems to demand thinking, calculating, and constructing in a myriad of ways. We have in all likelihood lost forever the ability to define a horizon of epistemic certainty, a center from which to span the globe. But we might gain an understanding of the merits of transdisciplinary engagement with uncertainty. A sphere of mutual trust in researching and teaching.

"I was thinking about this as a scientific problem, really motivated by geological nature as the ultimate sense of what we are talking about. That is why we come to spheres—like hydrosphere, lithosphere, atmosphere—these are all sub-disciplines but they are really part of the geological earth in some way, and I think the technosphere is another such example."

—Peter K. Haff, geologist

"[…] what work [creates] the technosphere […] today? What futures does it shape? No longer dialectical, this sphere of detritus and junk, of clouds and algorithms, of sensors and satellites, dominates our imaginations and makes our lives possible, probable, and even inhabitable, even as it is annihilating the planet. In turn we now fantasize of escaping the sphere, of burrowing, extrapolating, extracting, subtracting, demoing, and speculating, even to the stars, out of this seemingly closed space of the sphere. The question remains then as to how might these logics and languages—of derivation and optimization—be used, hacked, subverted, subtracted, repurposed, or perhaps actually disposed of… in ways that might yet still make possible alternative forms of life."

—Orit Halpern, media scholar

Editors: Nick Houde (Research Associate), Katrin Klingan (Head of Project), Christoph Rosol (Research Associate), Carlina Rossée (Project Coordinator)

The Anthropocene Curriculum is being developed by HKW and the Max Planck Institute for the History of Knowledge, Berlin. In cooperation with: Aarhus University Research on the Anthropocene (AURA); the Cluster of Excellence "Image Knowledge Gestaltung. An Interdisciplinary Laboratory," Humboldt-Universität zu Berlin; Center for Global Sustainability and Cultural Transformation (CGST) of Leuphana University, Lüneburg, and Arizona State University; Center for Interdisciplinary Studies in Science and Cultural Theory (CISST), Duke University, Durham; Deutsches Museum, Munich; Environmental Humanities Laboratory of the KTH Royal Institute of Technology, Stockholm; Institute for Advanced Sustainability Studies (IASS), Potsdam; Rachel Carson Center for Environment and Society, Munich; Research Institute for Humanity and Nature (RIHN), Kyoto.

Please find further information and documentation on the project's website at anthropocene-curriculum.org.

HKW
Haus der Kulturen der Welt

DEEP TIME
CHICAGO

GOETHE INSTITUT

This work has been published as part of the Deep Time Chicago pamphlet series, with generous support from the Goethe-Institut.

Designed and typeset by Dan Mohr / yesIsaid.com

Typeset in Open Sans, a Google Font: https://fonts.google.com/specimen/Open+Sans; and BPTypewrite, by backpacker: http://backpacker.gr/fonts/10

"The Anthropocene dictates that human action is Earth action and vice versa. Our approach to the production and practice of knowledge needs to reflect that fact."

DEEP TIME
CHICAGO