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An Evolutionary Eclipse

(Catalog text for KölnSkulptur#10 **ÜberNatur – Natural Takeover**, curated by Tobias Berger, forthcoming 2021)

> More images of Asian tigers than Asian tigers left in the wild.
> —Katja Novitskova[1]
>
> The mass of the planet does not change.
> —Dane Mitchell[2]

I.

There is a sculpture in *Skulpturenpark Köln* you were never meant to see. A sculpture ruined by the fact that it shows up in the exhibition info and that I am writing about it now.

This is Ayse Erkmen's *Lonesome George* (2020), a life-sized, and hence miniscule, bronze of George, the last member of the Hawaiian tree snail species *Achatinella apexfulva*, who died on January 1, 2020, thereby sealing its extinction. Born in a breeding facility at the University of Hawaii into an already endangered population, by the time George reached sexual maturity in 2012, his stewards could not find him a mate and, alone, he remained the last known exemplar of his kind. Erkmen's act of replicating

George in bronze and placing the work so it cannot be found is not so much the memorialization of a species but a reenactment of its absence. It points to the circumstance that, unlike George, the majority of 'last members' will never be found and identified, for most species currently on the brink of extinction have never been registered in the first place (an estimated 85% of all species today remain undocumented[3]). Their passing constitutes an imperceptible loss.

Another detail is worth noticing. The artist inscribes into the placement of her work the reason *Achatinella apexfulva* is gone: by putting a *Hawaiian* snail into a park in *Cologne*, Erkmen performs an act of posthumous species invasion. The Hawaiian tree snail had fallen prey to an invasive species: the rosy wolfsnail (*Euglandina rosea*) that was purposely introduced to Hawaii in the 1950s to check an overpopulation of Giant African snails, but preferred hunting down George's kin.[4] Perhaps you will say the posthumous presence of George simply comes down to the happenstance of Erkmen being invited to make a work for *KölnSkulptur #10*. But think again. The widespread blending and mixing of biomes on a global-scale, which is a crucial factor in today's elevated rates of biological species extinction, is by and large brought forth by the same vectors of globalization that cause you to witness an exhibition

of artists from all round the Earth in a single park in Cologne, Germany, or allow you to find an assemblage of plants from every continent in the greenhouses of the Flora and Botanic Garden across the street.

There's a connection. Erkmen's *Lonesome George* already embodies a whole discourse on extinction.

Another invasive species has made its way into the Skulpturenpark, and this one you cannot possibly overlook. Dane Mitchell's *Post hoc* (2019) is comprised of two cell phone towers purchased in Guangzhou, China, whose disguise as pine trees is so rudimentary it makes them almost painfully stand out.[5] Once you connect to these towers with your mobile phone, you are again drawn into a sphere of loss and absence as you listen to an endless array of *extinct reptiles*, *extinct fish*, *extinct mammals*, and so forth.[6] *Post hoc* contextualizes George's story within the panorama of the looming sixth biological mass extinction.[7] But things have not just vanished from the natural world. Mitchell also gives us long lists of *extinct languages*, *obsolete tools*, *software* and *media formats*, *superseded scientific theories*, *defunct search engines*, and the like.[8] At the brink of a biological extinction event, we are very much inside a cultural one too. With 50–90% of all human languages predicted to be gone by 2100,[9] cultural

content from a pre-modern and pre-globalized Earth is disappearing at a record pace.

Where Erkmen's work invokes the imperceptibility of extinction, Mitchell's exposes its unfathomability. You will never be able to consume the work in its entirety or catch more than a small glimpse of the 3.2 million items—broadcast at 120,000 items per day—on his lists, imbuing what is gone with an air of dark sublimity. So immeasurable is the loss, it transcends our cognitive grasp.

Is it even us who are doing this?

Post hoc, which translates as 'in the aftermath' or 'after the fact', suggests that these losses are registered only after they have occurred, i.e. losing these things was not intentional. All this stuff was never discarded; it just went missing.

II.

Is there a link between Dane Mitchell's list of *extinct mammals* and, say, his list of *obsolete farming techniques*? How does biological loss relate to cultural loss? Are these just items pasted together, or is there an underlying structure and driver?

Leelee Chan's *Blindfold Receptor (Gulf Frit. Orange)* (2020) is a colony of wheels inhabiting a frame of readymade metal columns, taking on the form of a stela. The work has an element

of rigidity through its upright posture and industrial fabric, while the curvature of its vertical array of wheels and graduated bottom wheels retains a trace of something organic. Notice two types of wheels: the cyan-grey stock omni-wheels and the upside-down trolley wheels at the base of the sculpture, where these colours reappear in a mottled fashion. This gesture of camouflage is key for the artist, who frames *Blindfold Receptor* as a reference to industrial melanism, a phenomenon that is a classic showcase of Darwinian evolution. In industrialized England, peppered moths in Manchester and elsewhere started taking on a darker ('melanic') complexion because the original brighter specimens—easily detected on sooty backgrounds—were now more heavily preyed upon.[10] That peppered moth caterpillars also have the capacity to change colour dependent on background was discovered much later.[11] In *Blindfold Receptor* you find trolley wheels that have 'adapted' to the complexion of omni-wheels, which retain the visual impression of a myriad of larvae or caterpillars. But the omni-wheel is itself an 'adaption' of the 5,500-year-old principle of the wheel to its current information-technological habitat, where it finds itself in soccer robotics as much as in aviation logistics. *Blindfold Receptor* thus crucially interlinks two types of contemporary evolution: biological evolution and the cultural evolution of artifacts.

This overlay makes me want to tell the story of *ÜberNatur* as an evolutionary tale—as a tale of evolution and its contemporary eclipse—and place the other works in that context, too. As issues of nature-culture relations, deep time, and the Anthropocene have become prevalent in contemporary culture, evolution has also re-entered public imagination, as if through the back door. The virulence of evolution today is showcased in exhibitions like *Jaguars and Electric Eels* (2017)—in search 'for our evolutionary roots'[12]—at Julia Stoschek Collection, Berlin, and forms the background of events like the 2014 *Extinction Marathon*[13] at Serpentine Galleries, London. Artists such as Katja Noviskova (in this exhibition) and Timur Si-Qin theorize their work in explicitly evolutionary terms: 'If you think about culture as variation—variation, mutation, replication—then ecology and evolution come into play.'[14] Evolution is not at all a thing of the deep past; it is a contemporary phenomenon and a political one. Let's find out what *ÜberNatur* tells us about it.

III.

Blindfold Receptor arose from Leelee Chan's practice of exploring and collecting artifact biodiversity encountered as industrial waste: 'My studio in Hong Kong is located in an industrial

neighbourhood with lots of warehouses, motor repair, hardware, and small, family-owned craftsman shops. This means that I come across an interesting mixture of all kinds of remnants and objects on the side streets and dumpsters on the way to my studio. I simply cannot help but save the most interesting ones.'[15] Many of her works are comprised of such found artifact specimens that she treats with a Haeckelian will to aestheticization and in her hands take on an animist quality. In doing so, Chan can draw from a 'Cambrian Explosion' of artifacts in the Anthropocene,[16] which has today caused the diversity of technical artifacts and their component parts to match the diversity of life in the biosphere: 'Altogether, in early 2019 there were some 9,500 different mobile [phone] "species"—and that total is considerably larger than the known diversity of mammals (fewer than 5,500 species).'[17]

But the contemporary evolution of artifacts, of the industries that produce them, and of the complex societies that host these industries, is also a driver of contemporary biological evolution (see fig. 1). Industrial melanism is emblematic of the current transformation and creation of biological species via escalating human activities, of which there are countless examples: the evolving of fish through selective industrial fishing, bacteria through exposure to antibiotics, and new animal

(and future human, remember COVID-19?[18]) pathogens by way of habitat intrusion—not to mention the recent crop and livestock evolution by way of human selective breeding processes.

The flipside of this 'new burst of evolution',[19] however, is extinction. And this makes sense: where some species manage to adapt to the new anthropogenic habitats, for others, the current speed of change is too rapid. Outpaced by what has been termed the 'Great Acceleration'[20] of human cultural evolution post-1950, the biological evolution of many plant and animal species ends today.

What is perhaps less intuitive is that accelerated cultural evolution also accounts for the extreme degrees of extinction and obsolescence in the cultural sphere itself—as documented by Mitchell's *Post hoc*. Here lies the answer to my original question about how biological loss relates to cultural loss. Presenting us with the unfathomable scale of all that no longer exists, *Post hoc* uncovers what appears as a paradox: obsolescence is the mirror image, the logical implication, of novelty itself. Increasing novelty production does not get rid of obsolescence, but produces more of it. *Unfathomable novelty accounts for unfathomable loss*, biological and cultural. Katja Novitskova: 'For every extinct butterfly with a unique wing pattern a silicon wafer

is printed, for every dying mosquito a digital image is uploaded.'[21]

We can even think of this in art terms.

When Mary Bauermeister, whose work *Rübezahl* (2020) is included in *ÜberNatur*, started her career in the 1960s, she was a participant and enabler of Fluxus; but think how many artistic paradigms and styles have come and gone just within Bauermeister's professional life as an artist.

Post hoc contains lists of *closed art galleries* and *destroyed artworks* but could just as well feature day-long lists of obsolete art movements.

IV.

Trying to blend into a natural environment that no longer exists, Dane Mitchell's cell phone towers do not just recite lists of *obsolete software* or *discontinued operating systems* but in themselves foreground the digital communication infrastructures, and more broadly the vectors of digitalization, that are as much at the heart of the contemporary globalization of information and logistics as they are at the centre of knowledge production, technological development and, ultimately, culture.

Enter the artistic practices of Katja Novitskova and Guan Xiao. Both are set in the recent Cambrian Explosion of visual

culture, in the unfathomable growth of 'image populations' (David Joselit[22]) as a consequence of digital image-making and image infrastructures. Both of their works for *ÜberNatur* enact the ways in which the digital is part of, and shapes, the real by rematerializing digital imagery and signs into the 3D space of Skulpturenpark—a hashtag in Guan's *Old Eggs and the Catcher* (2020) and a digital image of hatching snakes in Novitskova's *Approximation (corn snakes hatching)* (2017).

At the same time, the artists are concerned with understanding how evolutionary processes are operative today. Not accidentally, Guan was part of the aforementioned *Jaguars and Electric Eels* exhibition. Novitskova describes working on her early project *Post-Internet Survival Guide* (2010) like this: 'I looked at it in relation to the narrative in human evolution—like from when we were half-monkeys till now—basically, how this evolution is driven by what is trending and what is cool.'[23] The artist re-inscribes evolutionary processes into the ways contemporary visual culture functions. Evolutionary psychology is the ground of her Approximations series (2012–), comprised of standees made from predominantly animal-themed images. The series rests on the observation that a substantial part of Internet traffic is generated through images of animals, often baby animals. Novitskova finds the reason for this in an

evolutionarily generated cognitive hardwiring: 'If you think about success and trends in forms, it automatically brings you to these timespans of evolution where certain shapes get developed, like why humans have a preference for symmetry and how symmetry is used in imagery.'[24] The brain reacts in specific ways to the animal patterns that grab our attention. Guan: 'They just jump out [of the screen].'[25] Through the use of these images in advertisements and on social media platforms, our evolutionary makeup is monetized. With her Approximations series, Novitskova wagered she could base an artistic career on the 'almost dumb' functioning of hard-wired 'patterns of activation': 'It worked—and I became a visual artist with a career!'[26]

While I personally would not overestimate the explanatory value of evolutionary psychology in contemporary visual culture —isn't *the medium* the message, after all?—there is no doubt that some of our psychological and cognitive aprioris have been produced by evolution in the deep time of the species.[27] And taking notice of the ways in which cultural evolution has shaped the present is indeed helpful. Cultural evolution, for the majority of human history, is a process linked to the biological fitness effects of cultural traits and the specific selectivities of intergroup competition,[28] which operates on trans-generational

timescales: it is slow vis-à-vis the length of an individual life. Many lives are needed to accumulate complexity. The presence of eggs and larvae in *ÜberNatur* as seen in the works by Chan, Novitskova, Guan, and John Bock points to this generational underpinning. Over time, cultural evolution has created a myriad of diverse pre-global cultures and societies on Earth—a vast plane of cultural difference that later became the precarious playing field of (colonial) globalization and (capitalist) modernity—and thus shaped the world we inhabit.

V.

But cultural evolution does not feel very evolutionary these days.[29] New fields of technology can now emerge within a single lifetime—some creators of early computer chips in the 1950s are still around to witness the rapid development of processor technology, which today is about to hit the physical limits of circuit miniaturization (quantum effects). I think of this as cultural evolution in warp drive mode; a warped evolution no longer driven by selection acting upon 'random' variability, or practitioners tinkering with their cultural heritage to stumble over some innovation, but by the guided innovations of an 'army' of hundreds of thousands of people around the globe who, from morning to night, do nothing but research and

development, drawing and mining cognitive structure from everything they can find on this planet. The products of warped evolution are increasingly decoupled from biological fitness effects[30] and instantly distributed around the world: a real-time global delivery of new cognitive structure and its applications by way of telecommunication networks and global state-enterprise conglomerates (see fig. 1). In effect, the global middle classes and elites use virtually the same technologies everywhere to compute, communicate, cure illnesses, conduct operations, drill for oil, or produce chemicals—not much variability in these core technologies.

	Regular	Warped
Biological	[today:] New selection pressures through anthropogenic habitat alteration and breeding	[today:] Biological change through biotechnology and synthetic biology
Cultural	[past and future:] Accumulative innovation Transgenerational timescales Fitness effects Group selection	[today:] Guided innovation Intragenerational timescales Decoupled from fitness effects Instant global distribution

Fig. 1 Our Quadruple Evolutions

Did I not believe the opposite, I would say it is the wrong time to speak about evolution, for warped evolution is now so prevalent on Earth that it has virtually eclipsed the way evolution has, for the most part, functioned.[31]

We are inside an evolutionary eclipse (fig. 2).

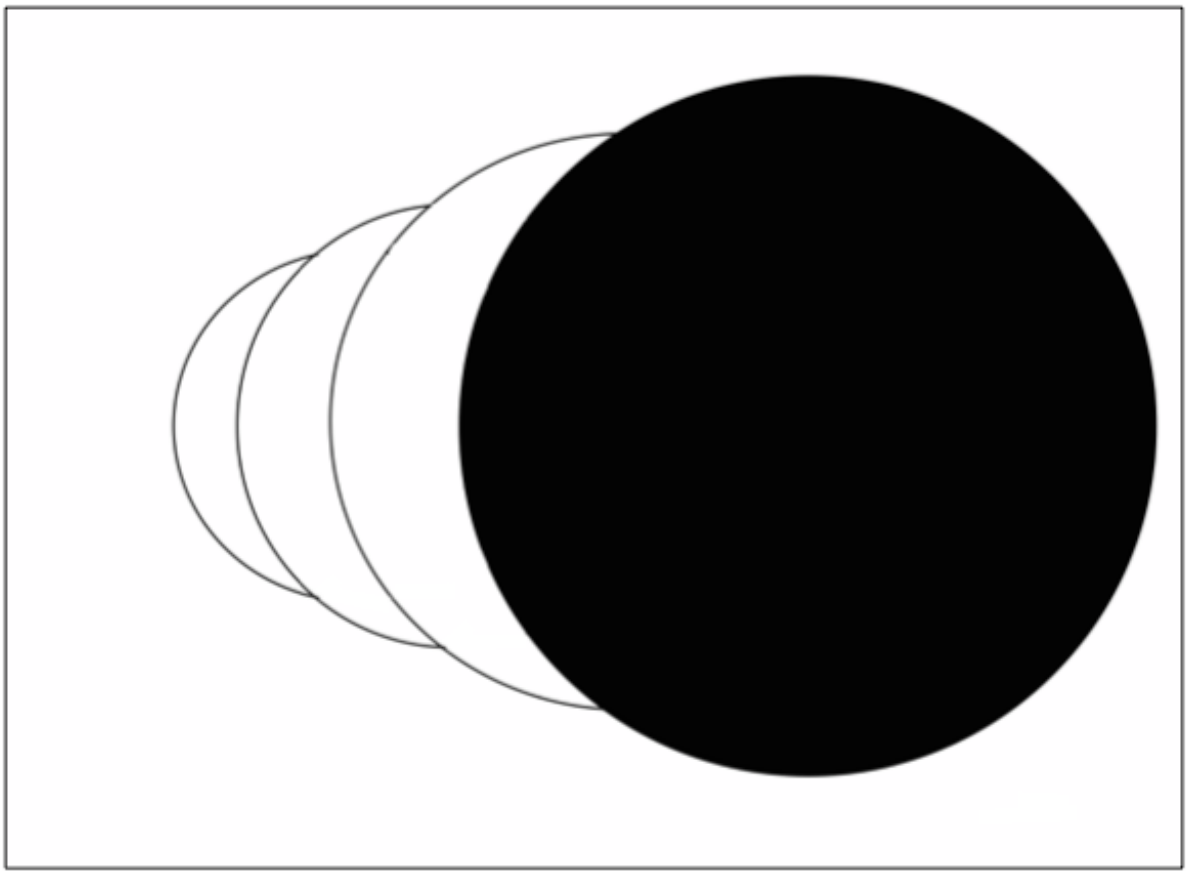

Fig. 2 Our Evolutionary Eclipse

Another example of this would be biotechnology, which in less than fifty years warped from the discovery of the DNA structure (1953) to the computational mapping of the complete human genome (Human Genome Project/Celera, 1998). While

biotechnology's advances may not seem quite as rapid as those of digital technology (the mapping of gene *function* in the human genome is still at early stages), the widespread use of genetic engineering in the agricultural and pharmaceutical industries manifests a circumvention of any known mechanisms of biological evolution and respective timeframes.[32] Biotechnology introduces warped evolution into the biological world (fig. 1): instead of slow trans-generational change, the genetic interventions of consorting human bioengineers. Organisms will look very different once the eclipse has passed.

VI.

Bioengineering is a recurrent feature in Novitskova's practice[33] and contributes to the 'alien' appeal of many of her works. The hashtag in Guan's *Old Eggs and the Catcher* tags what looks to me like a clutch of alien eggs. But these artists' alienology points to Homo sapiens rather than to some distant other. We are the aliens. For our evolution—no matter whether biological or cultural, regular or warped (fig. 2)—is alienation: a process so strange and inhuman the contemporaries of Darwin and Wallace could not believe their ears when they heard about it, and today a process so fast it puts all formed forms of self-understanding and self-identification though a test of constant revolution.

Framing evolution as alienology makes sense in that it is unclear if this process is at all happening *for* us.

Does it serve us?

Novitskova's position is that of an agnostic in the age of extinction: 'We've had tons of really, really big extinctions. The curve is always going up and down, up and down, and there is this moment of mass extinction followed by a moment of massive expansion of new forms. . . . The extinction is always followed by something new, and therefore, somehow, it's never an apocalypse; it's always just a mini-apocalypse for specific species—for us.'[34] But while warped evolution clearly comes with great benefits for many people,[35] the extinctions both biological and cultural it triggers also involve huge costs for many humans and nonhumans alike. Erkmen's and Mitchell's works attest to this. Evolution is a force that is not benevolent *per se* to the living beings it engenders.

The issue of evolution today thus poses itself as the question of desirable change: How do we find desirable modes of change and design warped evolution such that it does not hurt humans and other critters?

VII.

We can take the works by Trevor Yeung and Mary Bauermeister in *ÜberNatur* as two data points inside this colossal question.

Yeung's *Two Reliers* (2020) performs a gesture of care by using a decorative lamppost to physically support a Ginko tree. Shifting utility from human usage to plant care, the street light is equipped with an LED grow light bulb to stimulate the tree's development at all times. These bulbs are usually employed for horticulture in indoor settings like greenhouses; Yeung's use of such a light under the open sky takes the greenhouse paradigm outside. The biosphere as greenhouse is the biosphere after the end of nature, OK. But the biosphere as greenhouse is more than a descriptive metaphor of our status quo—it has an aspirational quality as well. For typically, you know what's going on in the greenhouse. You have an inventory of all its items down to the skin of a dragonfly larva, see John Bock's *Schlupf* (2020). The greenhouse, in other words, is a space of epistemic permeation, where you have an idea of all relevant factors in play and are aware of all changes taking place inside, not least because it is you who brings them about. Conversely, as Mitchell's *Post hoc* suggests, most of the vast changes in the biosphere today come about as non-intentional side effects of other pursuits, occurring on the periphery of people's attention or even entirely unbeknownst to them.

So this is our first data point: Desirable change in the biosphere is change *that can be desired in the first place*, i.e. change that can become an object of evaluation because it happens in an epistemically transparent way. Only then can people start making conscious decisions regarding, for example, the tradeoffs between increases in human welfare and related degrees of climate change or biodiversity loss. Warped evolution in fields like ecology and ecosystem science has brought us tools that increasingly put us in a position where we can make that evaluation.

Another advantage of warped evolution is that it takes place at the scale of a lifetime, where so much now happens inside our increasingly long lives. Because it is not, as under conditions of regular cultural evolution, spread out over huge trans-generational timescales—accumulating differences that people are then simply born into—change is much more in our hands. You no longer need to assemble the dead and the unborn to have all parties at the negotiating table.

All you need is the living.

Here Bauermeister's *Rübezahl* (2020) comes in. *Rübezahl* is the most voluminous work in *ÜberNatur* and its gravitational centre. The installation, comprised of an array of seats made from tree trunks of different sizes and ages, some severely

weathered, some newly cut, invites different people and beings to assemble under the spirit of the mountain ghost Rübezahl. This folkloric character is just one of the manifold spirits that show up where humans drill into the Earth (in the fifteenth century, he was carried by miners from his origin in the Harz into the Krkonoše mountains, where he became notorious); hence, Rübezahl is more of a mining than a mountain ghost and, thus, quite literally a ghost of the Anthropocene.[36] A good spirit to navigate our geological epoch. *Rübezahl*, in its beautifully anachronistic materiality, gestures towards a planetary 'parliament of things', to use Bruno Latour's term,[37] a parliament representing humans and nonhumans as a procedural machine for producing feedback.

And this is our second data point: Desirable change is change whose consequences, for people and beings around the world, is fed back into the process that brings it about. Only planetary-scale feedback generates change that is non-violent (not brought to you as war and cultural or economic annihilation), non-exclusive (for everyone, not just some), non-externalizing (not dumping its cost on people and creatures that have no say in the process), and paced to the humanly possible. Warped evolution must be turned into political procedure.

Was I to boil down *ÜberNatur*'s proposition on desirable change in times of warped evolution into a single sentence, my pick would be this: 'A global parliament of things inside a greenhouse in Cologne!' And that's what the exhibition, on the level of sculpture, of course already is.

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[1] Katja Novitskova, 'Neverending Story: Patterns of Survival and Expansion Curves', filmed October 2014 in London, as part of *Extinction Marathon: Visions of the Future*, Serpentine Galleries. Online: www.youtube.com/watch?v=7Qblup9qx5U.

[2] Dane Mitchell in 'Post Hoc', 2019, *Nowness*. Online: www.youtube.com/watch?v=zf-6neMqcr4.

[3] Camilo Mora et al., 'How Many Species Are There on Earth and in the Ocean?', ed. Georgina M. Mace, *PLoS Biology* 9, no. 8 (August 23, 2011): e1001127. Online: https://doi.org/10.1371/journal.pbio.1001127.

[4] See Christie Wilcox, 'World's Loneliest Snail Dies, and a Species Goes Extinct', *National Geographic*, Animals, January 8, 2019. Online: www.nationalgeographic.com/animals/2019/01/george-the-lonely-snail-dies-in-hawaii-extinction/.

[5] Pine trees are in fact an invasive species in Mitchell's native Aotearoa New Zealand, see 'Wilding Conifers', Department of Conservation. Online: www.doc.govt.nz/nature/pests-and-threats/weeds/common-weeds/wilding-conifers/ (accessed July 23, 2020).

[6] Lists in italics from Dane Mitchell's *Post hoc*, New Zealand Pavilion at Venice Biennial 2019, exhibition booklet.

[7] Elizabeth Kolbert, *The Sixth Extinction: An Unnatural History* (New York: Henry Holt and Company, 2014).

[8] Ibid.

[9] David Crystal, *Language Death*, Canto Classics edition (Cambridge: Cambridge University Press, 2014), 18f.

[10] 'Peppered Moth Evolution', *Wikipedia*, June 21, 2020. Online: https://en.wikipedia.org/w/index.php?title=Peppered_moth_evolution&oldid=963780587.

[11] Amy Eacock et al., 'Adaptive Colour Change and Background Choice Behaviour in Peppered Moth Caterpillars Is Mediated by Extraocular Photoreception', *Communications Biology* 2, no. 1 (December 2019): 286. Online: https://doi.org/10.1038/s42003-019-0502-7.
[12] *Jaguars and Electric Eels*, exhibition at Julia Stoschek Collection, Berlin, 2017, quoted from the exhibition publication, 5.
[13] *Extinction Marathon: Visions of the Future*, Serpentine Galleries. Online: www.serpentinegalleries.org/whats-on/extinction-marathon/ (accessed July 23, 2020).
[14] 'Katja Novitskova and Timur Si-Qin in conversation', *Living Content*, issue 8, 2018, 4.
[15] 'Assume Form: Leelee Chan', *Mousse Magazine* (blog), February 27, 2019. Online: http://moussemagazine.it/assume-form-leelee-chan-chiara-moioli-capsule-shanghai-2019/.
[16] Inspired by Katja Novitskova's work *The Cambrian Explosion 001* (2012), which showcases artifact diversity with the example of surveillance cameras.
[17] Vaclav Smil, 'Animals vs. Artifacts: Which Are More Diverse? [Opinion]', *IEEE Spectrum* 56, no. 8 (August 2019): 21. Online: https://doi.org/10.1109/MSPEC.2019.8784118.
[18] John Vidal, 'Destroyed Habitat Creates the Perfect Conditions for Coronavirus to Emerge', *Scientific American*. Online: https://www.scientificamerican.com/article/destroyed-habitat-creates-the-perfect-conditions-for-coronavirus-to-emerge/ (accessed May 26, 2020).
[19] Darren Curnoe, 'Humans are driving a new burst of evolution including possibly our own', phys.org, February 8, 2017. Online: https://phys.org/news/2017-02-humans-evolution-possibly.html (accessed July 22, 2020).
[20] Will Steffen et al., 'The Trajectory of the Anthropocene: The Great Acceleration', *The Anthropocene Review* 2, no. 1 (April 1, 2015): 81–98. Online: https://doi.org/10.1177/2053019614564785.
[21] See Katja Novitskova's website. Online: https://www.katjanovi.net/macroexpansion.html.
[22] David Joselit, *After Art*, POINT: Essays on Architecture (Princeton: Princeton University Press, 2013), 24ff.
[23] Susanna Davies-Crook, 'The topic is the birth and evolution of worm', *Exberliner*, November 13, 2012. Online: https://www.exberliner.com/whats-on/art/for-each-new-project-i-go-back-to-basics/
[24] Ibid.

[25] Guan Xiao in 'Beyond Language - The Thing About . . . Art & Artists - Guan Xiao', *The Thing About*, 2018. Online: https://www.youtube.com/watch?v=-Wq58nmt1aA.
[26] 'FETIVALS // The Influencers 2018. Katja Novitskova (OV En)', 2018, CCCB, Barcelona. Online: https://vimeo.com/304581059. For a similar hypothesis, see Timur Si-Qin, 'Stock Photography as Evolutionary Attractor', *DIS Magazine*. Online: http://dismagazine.com/dystopia/42017/stock-photography-as-evolutionary-attractor/ (accessed July 21, 2020).
[27] For me, evolutionary psychology is problematic not least because it is *not* a theory of cultural evolution and is thus not able to explain the overwhelming majority of today's cultural phenomena. I also share Stephen Gould's reservations, see Stephen Jay Gould, 'Sociobiology: the art of storytelling', in *Scientific American*, 16 (November 1978): 530–33.
[28] The technical term here is 'group selection'. See, for example, Peter Turchin, *Ultrasociety: How 10,000 Years of War Made Humans the Greatest Cooperators on Earth* (Chaplin, Connecticut: Beresta Books, 2016).
[29] For some essentials of cultural evolution theory and a path into the literature, see Daniel Falb, *Geospekulationen. Metaphysik für die Erde im Anthropozän* (Berlin: Merve Verlag, 2019), 142–70.
[30] As witnessed by stage 4 of the demographic transition, see Max Roser, Hannah Ritchie, and Esteban Ortiz-Ospina, 'World Population Growth', *Our World in Data*, May 9, 2013. Online: https://ourworldindata.org/world-population-growth. Some cultural evolution theorists still have a hard time wrapping their heads around this, see, for example, Peter J. Richerson and Robert Boyd, *Not By Genes Alone: How Culture Transformed Human Evolution* (Chicago: University of Chicago Press, 2008), 148ff.
[31] For that very reason, however, I think it is important to call warped evolution 'evolution': (a) to mark *that difference*, i.e. to keep evolution present as the relevant horizon of reference for understanding what's happening today, and (b) to mark the fact that classical evolution *does not stop*, but in multiple ways stays present, even in elevated fashion (first quadrant of fig. 1), but also that classical evolution is the level that warped evolution will ultimately fall back to.
[32] Massimo Pigliucci and Gerd Müller, eds., *Evolution, the Extended Synthesis* (Cambridge, MA: MIT Press, 2010).
[33] See, for example, the strange encodings of Novitskova's Untitled (2018) series at her 2019 *Preis der Neuen Nationalgalerie* exhibition at the Hamburger Bahnhof, Berlin.
[34] Katja Novitskova, 'Neverending Story: Patterns of Survival and Expansion Curves', *Extinction Marathon*, 2014. Statements like these have provoked occasional

critique of Novitskova's evolutionary stance. Kirsty Bell argues, 'This embrace of a broad-brush biological determinism equates corporate image conventions with the principles of natural selection, and seems to suggest that economic rebound and growth belong to the natural order of things.' Kirsty Bell, 'In Focus: Katja Novitskova', *Frieze*, no. 166, September 24, 2014. Online: https://frieze.com/article/focus-katja-novitskova (accessed July 21, 2020). See also Sealan Twerdy, 'Attention Ecology: Biological Metaphors in Post-Internet Art', conference talk at Concordia AHGSA Conference: Constellations, Clusters, Networks, March 7, 2015. Online: https://www.academia.edu/11437863/Attention_Ecology_Biological_Metaphors_in_Post-Internet_Art_2015 (accessed July 21, 2020).

[35] Hans Rosling, Ola Rosling, and Anna Rosling Rönnlund, *Factfulness: Ten Reasons We're Wrong about the World--and Why Things Are Better than You Think* (New York: Flatiron Books, 2018).

[36] 'The winds of the Anthropocene carry ghosts', in Anna Lowenhaupt Tsing et al., eds., *Arts of Living on a Damaged Planet* (Minneapolis: University of Minnesota Press, 2017), 1.

[37] Bruno Latour, *We Have Never Been Modern* (Cambridge, MA: Harvard University Press, 1993), 142ff.