Blind Date with the Future

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The Mobilisation of Matter in the Anthropocene

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In his book *Modernity at Large: Cultural Dimensions in Globalization*, anthropologist Arjun Appadurai noted that goods in modern society are increasingly traded across borders: 'technology, both high and low, both mechanical and informational, now moves at high speed across various kinds of previously impervious boundaries: a huge steel complex in Libya may involve interests from India, China, Russia and Japan, providing different components of new technological configurations.'*

Other authors also emphasise that in modern society the importance of ever-faster, cross-border exchange has grown strongly and continues to grow: 'Mass production and mass consumption [have] enormously condensed the network of exchange acts',* writes the social philosopher Panayotis Kondylis.

Hartmut Rosa has pointed out that in modern society technical and cultural acceleration are linked. As causes, he identifies not only economic acceleration pressures of capitalist production, but also socio-structural accelerators, which owe their existence to the functional differentiation of society, as well as cultural accelerators, which Rosa attributes in particular to the problem of the discrepancy between world time and life time in a secular culture. Possibilities are endless; human life is limited. However, acceleration might mitigate this problem: '[W]hoever lives twice as fast can realise twice as many world possibilities and thus, as it were, lead two lives in one; whoever becomes infinitely fast brings his lifetime closer again to the potentially unlimited horizon of world time or world possibilities insofar as he is able to realise a multitude of life possibilities in a single earthly lifespan and therefore no longer needs to fear death as an option destroyer.'*

But what effects do these accelerated throughputs have on the ecological, on the material level? At this point, Hartmut Rosa relies in particular on the concept of mobilisation,* which he traces back to Peter Sloterdijk, who in turn borrows it from Ernst Jünger and uses it prominently in his 'Critique of Political Kinetics'.*

Mobilisation of People and Matter

In the modern age, we can observe not only a mobilisation of people, but also a mobilisation of substances. More and more substances are being functionalised, put into service for human purposes—right down to the molecular and atomic level. This very phenomenon was first named by Ernst Jünger, who, in 1930, spoke in an almost futuristic essay of the 'total mobilisation' of matter as well. In many parts of the German academic world, Ernst Jünger is a persona non grata. The historian Hans-Ulrich Wehler, for example, refers to him as 'one of the figures of mischief in modern German history'.* For Wehler he was an activist of the 'total mobilisation'. The German scholar Helmuth Kiesel, who has written a comprehensive and critical biography of Ernst Jünger, has argued, however, that Jünger was neither 'the inaugurator nor an unreflective propagator of "total mobilisation", but its diagnostician'. He recognised in it 'an inevitable feature of the times'*, and its dynamics fascinated him.

Jünger's diagnosis of a totally mobilised world, and especially his important diagnosis of the mobilisation of matter, is too important to be pushed aside. This has also been pointed out by Sloterdijk, who

calls Jünger a 'bad man', 'whom one will never quote from a great distance without respect for his talent to observe and describe'.*

Jünger starts with the observation, that in First World War a mobilisation of the masses took place that was unknown until then.* But then he shows that the total mobilisation is also a characteristic of the 'working age' in peace, and not only with people, i.e., it does not only mean that troops are made ready for combat.

Jünger wants us to '[L]ook at this life of ours itself in its full unleashing and in its merciless discipline, with its smoking and glowing precincts, with the physics and metaphysics of its traffic, its engines, aeroplanes and cities of millions, in order to suspect with a feeling of horror mixed with pleasure that there is not an atom here that is not in work, and that we ourselves are deeply committed to the frenzied process.'*

In his book *Der Arbeiter* (The Worker), written a little later, he outlines in addition: 'We live in a time of great consumption, the only effect of which is to accelerate the wheels.'* This 'total mobilisation', which in Jünger's vision involves every atom, and which 'destroys everything that resists this mobilisation'* can be related to the world of substances. Jünger speaks explicitly of the 'mobilisation of matter', which corresponds to the 'parallel mobilisation of man'.* And this mobilisation has, as he says, a 'planetary dimension',* referring to the entire globe.

Jünger's essayistic diagnosis was studied in detail by Martin Heidegger.* Much later, it was also taken up by Peter Sloterdijk in his book *Eurotaoism*. Sloterdijk is concerned with a 'theory of the present'* and conducts his analysis in such a way that he 'openly uses the term mobilisation as a central descriptive and explanatory expression for the basic process of modernity'.* Despite his considerable and also understandable problems* with using a term coined by Ernst Jünger in 1930, this term seems to him to be without alternative when it comes to making the 'dynamic pattern of modernisation nameable'.* Therefore, for him, this very term becomes the centre of what he sees as a new, 'third'* form of critical theory.*

In the following, I am concerned with how the diagnosis of a mobilised world can be concretised on the level of substances and things.

Sand as an Example

An excellent example of such mobilised matter is sand:* sand, along with petroleum and coal and iron ore and bauxite, is one of those materials that are mobilised to the greatest extent. Concrete is mixed from four shovels of sand (and/or gravel) and one shovel of cement—plus water, of course. So, where there is a lot of building going on, as is the case almost everywhere on this planet, because humanity is growing and at the same time moving into cities—in just a few years, two thirds of us will be living in cities—sand is also needed. And more and more of it, because where cities grow, buildings are raised, and for that sand is needed. In terms of sheer mass, sand and gravel are the most important raw materials of modern industrial societies; also in Germany, where around six tonnes of sand and gravel are needed per capita and year.

Elsewhere it is even more, for example the city-state of Singapore is the world leader in terms of per capita consumption and is literally built on sand, increasing every year through sand dumped into the sea. In terms of the total amount, China is of course ahead, since new factories, roads, and homes are constantly being built. More than half of the world's consumption of sand and gravel is used in China. Construction accounts for the lion's share, but sand is also needed for glass production and for the production of silicon, which is indispensable in high-tech devices and in the entire semiconductor industry. After water, sand and gravel are the second most exploited natural resources, the use of which has tripled during the last decades. Humankind consumes more than forty to fifty billion tons of sand and gravel per year, more than twice the amount that rivers carry to the sea.*

But why should sand be a problem? Are the deserts not full of it? Their sand is not suitable for buildings, however, because it is almost always too fine. Only river sand and some sea sand are suitable. So, these sands are being mined. And what happens when this sand is taken away? It becomes being missed as an ecosystem and buffer which absorbs a part of the kinetic energy of water waves. In an age of global warming and rising sea levels, it makes more sense to leave the sand on coasts. Sand bodies contribute to the biodiversity of our living environment. Where sand beaches have disappeared due to exploitation, not only is a habitat extinguished, but often technical structures, such as concrete tetrapods, have to replace the protective effect of the material. But tetrapods, which are prominent in Stefanie Zoche's great artistic work on sand, are more or less dead structures compared to natural occurring sand bodies.

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'Psychozoic' and 'Anthropocene'

The mobilisation of matter is also taking hold of other substances; indeed, it is now mobilising even the most fundamental dimensions of the material world. All material things, including all goods, are made up of a limited number of naturally occurring chemical elements and their compounds or mixtures. There are around ninety such elements on Earth, plus a couple of unstable ones and some synthetic elements.

If one takes the diagnosis of a total mobilisation of matter seriously, then not only will the mass of traded and moved goods and substances increase—as has been shown by the Canadian geographer and environmental scientist Vaclav Smil who has analysed the 'material flows' of certain countries*—but so will the quantity. We process more and more types of materials, and gradually all elements of the periodic table. This deep mobilisation of matter is one of the most problematic aspects of the Anthropocene.

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The first to point out this mobilisation of the elements of the periodic table was the Russian geochemist Vladimir Vernadsky, who not only developed the concept of the biosphere, but was also the first to develop the concept of systematic and interdisciplinary research into that new geological epoch which, according to his diagnosis, is characterised in particular by the geochemical effectiveness of human activities on a global scale* and which today is referred to as the Anthropocene.* The Anthropocene is the natural-scientific-ecological complement of the social-scientific-philosophical diagnoses of modernity. The term was popularised by the chemist Paul Crutzen, who for his part already explicitly pointed to Vernadsky as a precursor.

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In the extended 1930 German translation of his work *Geochemistry*, Vernadsky identifies a new geological factor that is changing the face of the Earth. Whereas before only a few chemical elements were moved by organisms, this has been different since industrialisation. He writes: 'In the present geological epoch—the psychozoic, the era of the spirit—a new factor of the greatest geochemical importance is added. The geochemical activity of mankind has developed to an extraordinary degree and in a manifold way in the last millennia by means of agriculture, which grasps the green living substance. And this geochemical activity continues to grow before our eyes with incredible speed. The influence of the spirit and the collective mind of

man is becoming more and more evident in the geochemical processes. … In earlier times, organisms influenced only the history of those chemical elements necessary for their growth, nutrition, respiration as well as reproduction. Man has extended this limit by including in his circle also those elements which are necessary for technology and for the maintenance and development of civilised living conditions.'* According to Vernadsky, all the elements of the periodic table will soon be in the service of man.* Geochemical cycles that have played themselves out over very long geological periods are increasingly being disrupted. These two features, along with the release of carbon dioxide, which he also has already discussed in detail, are in his view the most important characteristics of the new age he postulates. 27

From his point of view, the Psychozoic was altogether a hope, a promise, although as a scientist he was far too reticent to paint it with such happy colours as his contemporary, the palaeontologist and theologian Teilhard de Chardin did. In modern Anthropocene research, the term has darkened completely and denotes a plethora of ecological, social and political problems. Moreover, in addition to purely material effects, ecological aspects are also being researched, such as the destruction of biotopes and ecosystems, and in particular species.* However, this aspect of the Anthropocene is closely and often indissolubly linked to the material movements in the Anthropocene, which Vernadsky was the first to clearly point out, and which still make up a large part of research on the Anthropocene today. 28 29

The Human Being as 'Master of the Atoms'

The Russian mineralogist Alexander Fersman, a student of Vernadsky's, illustrated how the setting in motion of *all* elements should be imagined in more concrete terms in a popular scientific work dedicated to geochemistry, using the example of the 'Soviet automobile SIS 110'. This Soviet limousine, which was already planned in prototypes in the early 1940s but was not mass-produced until 1946, is described by Fersman in the following words: 'Here exists … a combination of atoms which have been united for the sole purpose of delivering a tireless, strong, noiseless and fast car. 3,000 individual parts made of 65 types of atoms and more than 100 types of metals: that is the "SIS 110"'.* Sixty-five types of atoms—that's sixty-five chemical elements used for this car. That is two thirds of all known elements! One may doubt the high number, as it fits all too well with Fersman's intention to highlight the efficiency of the Soviet economy. But even if a detailed material analysis of the SIS 110 revealed only forty elements were used, this would already be a tremendously high number. From the research of his teacher Vernadsky, Fersman knows that the biosphere, i.e. the world of living beings, manages with much less effort, because all organisms known so far, from bacteria to humans, only need roughly twenty-two types of atoms according to current knowledge. These make up the entire living world with all its wealth of forms. 30

Fersman himself points out this contrast and explains that this is by no means a natural or even near-natural use, for he says: 'The light elements are most prevalent in the earth: five of them—oxygen, silicon, aluminium, iron and calcium—make up 91 per cent of the earth's crust. If you add seven more—sodium, potassium, magnesium, hydrogen, titanium, chlorine and phosphorus—then these twelve elements together make up 99.51 per cent. The remaining 80 elements therefore account for less than 0.5 per cent by weight.'* The human assembly of the sixty-five types of atoms in the Soviet sedan has no parallel in nature. Fersman therefore brushes aside the natural distribution of atoms: 'This distribution, however, does not quite please man; he persistently searches for the elements that are rarely found, snatches them from the earth with sometimes improbably great difficulty, explores in every way their properties and exploits them where it seems to him necessary and expedient. … There are atoms everywhere, and man is their master! With a mighty hand he seizes them, mixes them, throws away those he does not need, combines those he does, though without his intervention these elements would never be found together!'* 31 32

The Mobilisation of Matter and the Landfills: Toxic Sands and Other Remains

But what do the atoms that Fersman's heroic 'man' simply threw away do when they get into the atmosphere, groundwater, rivers and the sea? It is true that people are much more cautious today than in the first half of the twentieth century and are aware of the problem of unforeseen side effects.* Nevertheless, modern industrial society not only has to meet its raw material needs, it also has to dispose of its waste.

In other words: the problem is not only a lack of sand, but also toxic, possibly even radioactive sand and sludge, which is disposed of in conceivable and inconceivable ways. Rare earths, which are ingredients of many high technologies, occur in certain sands, monazites, from which they can be extracted in complicated chemical processes. However, these sands frequently also contain radioactive elements, especially thorium, so the 'waste' produced during their processing is often not 'just' toxic, but radioactive. Where to put it?

And radioactive sands are just one example of all kinds of wastewater, waste, sludge, dust and sands that have to be disposed of safely. Very generally, the environmental historian Rolf Peter Sieferle already outlined the problem: 'Industrialisation', he writes, 'is based on two material preconditions that cannot in principle be sustainable. On the one hand, it draws on exhaustible stocks of resources (fossil fuels, ore deposits), which is not possible on this scale in the long term. Secondly, it fills landfills with waste materials, which leads to considerable environmental problems in the long run.'*

The landfill problem usually becomes virulent earlier than the resource problem, as can be seen in climate change, for example, which also unfolds because the air must serve as a global dumping ground for the carbon dioxide produced by burning fossil fuels, but also by making steel and producing cement.

Mobilisation in this context means that small amounts of material have to be extracted from huge amounts of rock or sand using sometimes very complicated processes. In the case of gold ores, for example, deposits containing 2.5 grammes of gold per tonne(!) of rock, gravel or sand are currently considered worthy of extraction. If one considers that around 190,000 tonnes of gold have been extracted worldwide so far,* then one can appreciate that this amount of gold leaves behind enormous piles of rubble and destroyed landscapes. There are also real toxic deposits,* because toxic substances, for example mercury or potassium cyanide, are very often used in the extraction of gold, as in the extraction of many other metals.

In his history of gold, the environmental historian Bernd-Stefan Grewe therefore writes: 'Thus the environmental history of gold is above all a history of the destruction of nature by mining.'* And gold is only one of about fifty metals and semimetals that are mined and isolated worldwide on an industrial scale. All these mobilisations create huge amounts of dust, create dumps, mud lakes or disposal sites, even sarcophagi, which, however, as we know, by no means ensure that the substances decommissioned and stored there remain locked away for eternity.

The Mobilisation of Matter and the Camps: Mineral Extraction and Human Exploitation

Dealing with substances in the modern age has not only a technical or eco-technical dimension, but also a social and political one. This dimension cannot be systematically addressed within the framework of purely natural science approaches. Such approaches in environmental science are important, but one must always keep in mind that their methodological approach can only capture one aspect of a complex socio-ecological problem. Concepts like that of 'material flows' and 'cycles' entail a naturalisation that hides the power-determined political contexts in which these processes take place.

Generic terms such as 'man', or 'the people' or 'humanity', which are found in both Vernadsky and Fersman and which are also frequently encountered in the context of scientific Anthropocene

research, should also only be used with the greatest caution, because the concrete culturally and politically mediated processes of mobilisation are often obscured by these designations.

Fersman, for example, writes, as I have already quoted: 'Everywhere there are atoms, and man is their master! With a mighty hand he seizes them, mixes them, throws away those he does not need, joins those he does need.' He refers, as can be deduced, to the extraction of raw materials within the framework of Stalin's five-year plans.

Here, we come to a fundamental point: all processes of mobilising and manufacturing happen in concrete historical situations.* If one looks more closely at the contexts and is not satisfied with the fact that it is 'people' everywhere who are active, then it often turns out that those who are involved with spade and wheelbarrow in the mobilisation of the 'atoms' that Fersman celebrates are completely disenfranchised. And this is not just very rarely or exceptionally the case; it is often if not regularly the case.

This is where various approaches to social science and humanities research come in; this is where it becomes apparent why the environmental social sciences and the environmental humanities are indispensable in the Anthropocene discourse. In contrast to naturalising concepts that use very generic terms such as 'material flows', 'material cycles' or 'life cycles', but also generic terms such as 'man' or 'mankind' to suggest that the observed phenomena are natural processes, modern research in material histories focuses precisely on the actions of concretely identifiable political collectives.* And here it is necessary to show *who* exactly sets these materials and things in motion, or has them set in motion, and *who* is left with the landfills and dumps, the poisoned soils, sands and waterbodies. It is about naming and precisely describing the movers. On the one hand, processes of domination and exploitation come into view.

It is not, as Fersman writes, 'man' who directly seizes the atoms. Against this socialist and even Stalinistic pathos, one should rather recall Georg Wilhelm Friedrich Hegel's insight that 'the master refers to the thing indirectly through the servant'.* In other words, labour processes almost always take place in the context of hierarchical social organisations in which some command and others obey. And this is true not only in capitalist systems, but also in socialist systems. On the other hand, mediated by unforeseen side-effects and by the complex self-activity of substances, people become involuntarily involved in the story who do not have any gains from these 'heroic' activities.

So, it is *actions* that are at the centre of the modern material histories, actions in very concrete social contexts, in specific historical situations.*

Sometimes it seems as if not only, as Jünger said, the mobilisation of people corresponds to a parallel mobilisation of matter, but also as if the dumps in which the unusable excrement of production and consumption is stored correspond to the camps, those unworthy dwellings at the edge of the material flows in which those who are directly or indirectly forced to participate in the mobilisation of matter dwell.

To return to the example: in fact, most of those atoms that were needed for the production of the high-tech car in the Stalin era were recovered by the hand of starving and freezing slave labourers who were imprisoned in the various camps of the Gulag, for example in Magadan and on the Kolyma. What it was like in such camps was vividly described by contemporary witnesses, especially the Russian writer Varlam Shalamov, who himself worked in such camps for eighteen years.* Today, the slave labour in the peat and sand on the Kolyma has been reappraised in historical and environmental research.* Similar conditions continue to exist. The contexts in which the high-tech metal cobalt or its ore is mined in the Democratic Republic of Congo are probably only the tip of the iceberg.*

Giorgio Agamben has posited that the camp is the *nomos* of modernity.* At the beginnings and edges of some commodity chains that end up with glittering and, of course, climate-friendly high-tech gadgets, we indeed find not only landfills but also camps or camp-like dwellings in which is realised what Agamben denounces, 'la piú assoluta conditio inhumana che si sia data sulla terra'* (the worst *conditio inhumana* that there is on Earth).

And this fact again points out that while the mobilisation of matter is a process that can be accurately described in scientific terms and

measures, methodological caution must be exercised in order not to fall into naturalisations that hide political issues.

Rather, methods from the humanities and social sciences are indispensable as a complement to quantitative studies, as they dominate modern Anthropocene research, because they bring in the *anthropoi*, the humans, and thus help to avoid a too naturalistic analysis. Artistic approaches, on the other hand, as exemplified by the intriguing works of Stefanie Zoche on sand, are important not only to raise attention, but also to help stimulate the imagination and to represent the ambivalences and ambiguities of a world in transformation.

1
Arjun Appadurai, *Modernity at Large: Cultural Dimensions of Globalization* (Minneapolis: University of Minnesota Press, 1997), p. 34. See also Mimi Sheller and John Urry, 'The New Mobilities Paradigm', *Environment and Planning* 38 (2006): 207–26.
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Panajotis Kondylis, *Das Politische und der Mensch: Grundzüge der Sozialontologie* (Berlin: De Gruyter, 1999), p. 520.
3
Hartmut Rosa, *Beschleunigung: Die Veränderung der Zeitstrukturen in der Moderne* (Frankfurt am Main: Suhrkamp Verlag, 2005), p. 474.
4
Ibid., pp. 315, 321, 458–59, 489.
5
Ibid., pp. 459–60.
6
Thus, in his review, 'Im Gruselkabinett deutscher "Helden"', *Die Zeit*, 24 June 2004, https://www.zeit.de/2004/27/P-Busche (accessed 24 May 2020).
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Helmuth Kiesel, *Ernst Jünger: Die Biographie* (Munich: Siedler Verlag, 2007), pp. 374–75. See: Uwe-K. Ketelsen, 'Die Totale Mobilmachung und Der Arbeiter', in Hans-Harald Müller and Harro Segeberg, *Ernst Jünger im 20. Jahrhundert* (Munich: Fink Verlag, 1995). On Jünger's essay, see Oliver Müller, *Selbst, Welt und Technik: Eine anthropologische, geistesgeschichtliche und ethische Untersuchung* (Berlin: De Gruyter 2014), pp. 129–34.
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Peter Sloterdijk, *Eurotaoismus: Zur Kritik der politischen Kinetik* (Frankfurt am Main: Suhrkamp Verlag, 1989), p. 50.
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Ernst Jünger, 'Die Totale Mobilmachung', in *Ernst Jünger: Werke* 5: Essays I (Stuttgart: Klett-Cotta, 1960), pp. 123–47.
10
Ibid.
11
Ibid., pp. 9–329, here p. 188.
12
Ibid., p. 166.
13
Ibid., p. 186.
14
Ibid., p. 239.
15
Martin Heidegger, 'Das Rektorat 1933/1934: Tatsachen und Gedanken', in Martin Heidegger, *Die Selbstbehauptung der Deutschen Universität / Das Rektorat 1933/1934* (Frankfurt am Main: Vittorio Klostermann, 1983), p. 21ff., here pp. 24–25. Jünger's influence is clearly recognisable in Heidegger's writings on the philosophy of technology and history, especially in his doctrine of the '*Ge-stell*', since this also focuses on a militarily connoted concept, the 'Stellen', and emphasises the planetary dimension.
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Peter Sloterdijk, *Eurotaoism: Zur Kritik der politischen Kinetik* (Frankfurt am Main: Suhrkamp Verlag, 1989), p. 47.
17
Ibid., p. 47.
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Ibid., pp. 48–52.
19
Ibid., p. 48.
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Ibid., p. 53.
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Hartmut Rosa, in turn, took over the keyword from Sloterdijk. See Hartmut Rosa, *Beschleunigung: Die Veränderung der Zeitstrukturen in der Moderne* (Frankfurt am Main: Suhrkamp Verlag, 2005), p. 459.
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See Vince Beiser, *Sand: Wie uns eine wertvolle Ressource durch die Finger rinnt* (Munich: oekom Verlag, 2021).

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See Pascal Peduzzi et al., 'UN Report on Sand' (2022), https://unepgrid.ch/storage/app/media/Publications/2022sandandsustainabilityreport-final.pdf (accessed 31 October 2022).
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Vaclav Smil, *Making the Modern World: Materials and Dematerialization* (Chichester: Wiley, 2014).
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See also Hermann Häusler, 'Did Anthropogeology Anticipate the Idea of the Anthropocene?' *The Anthropocene Review* I (2018): 1–18.
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On the Anthropocene, see Paul Crutzen, 'Geology of Mankind', *Nature* 415 (2002): 23, who refers to Vernadsky.
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Wladimir Vernadskij, *Geochemie in ausgewählten Kapiteln*, trans. Ernst Kordes, (Leipzig: Akademische Verlagsgellschaft, 1930), p. 231.
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Ibid.
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See the remarks of the zoologist Hubert Markl, who spoke of the Anthropocene instead of the Anthropozoic, in Hubert Markl, *Natur als Kulturaufgabe: Über die Beziehung des Menschen zur lebendigen Natur* (Stuttgart: DVA, 1986), p. 322ff.
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Alexander Fersman, *Unterhaltsame Geochemie* (Berlin: Neues Leben, 1953), p. 30; the Russian original must have been written and published before 1945, the year of Fersman's death.
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Ibid., 32.
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Ibid., pp. 32–33.
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See the example of rare earths: Luitgard Marschall and Heike Holdinghausen, *Seltene Erden: Umkämpfte Rohstoffe des Hightech-Zeitalters* (Munich: oekom Verlag, 2018), especially pp. 129–37.
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Rolf Peter Sieferle, 'Sonne und Feuer – Energieregimes in historischer Perspektive', in Jens Soentgen, Armin Reller, *CO2 – Lebenselixier und Klimakiller* (Munich: oekom Verlag 2009), pp. 93–114, here pp. 112–13.
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Bernd-Stefan Grewe: *Gold: Eine Weltgeschichte* (Munich: C. H. Beck, 2019), p. 12.
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For the gold described by Bernd-Stefan Grewe, ibid., pp. 11–12.
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Ibid., p. 12.
38
Heinrich Popitz, 'Technisches Handeln', in Heinrich Popitz, *Phänomene der Macht* (Tübingen: Mohr Siebeck, 1992), pp. 160–85, especially p. 164.
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For a critique of the similar metaphor of traffic flow, see Hugo Caviola and Andrea Sabine Sedlaczek, 'Grenzenlose Mobilität und fließender Verkehr: Eine kritische Sprachreflexion', *Gaia*, no. 3 (2020): 161–69.
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Georg Wilhelm Friedrich Hegel, *Phänomenologie des Geistes* (Frankfurt am Main: Suhrkamp Verlag, 1975), p. 151.
41
There is a rich literature on the concept of action. See, in addition to the work by Janich already cited, the clear exposition by Panayotis Kondylis, *Das Politische und der Mensch: Grundzüge der Sozialontologie* I (Berlin: Akademie Verlag, 1999), especially pp. 437–80.
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See the two stories 'Die Schubkarre I' and 'Die Schubkarre II', in Warlam Schalamow, *Die Auferweckung der Lärche. Erzählungen aus Kolyma* 4 (Berlin: Matthes & Seitz, 2011), pp. 380–82 and 383–403 respectively.
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See Paul Josephson, Nicolai Dronin, Aleh Cherp, Ruben Mnatsakanian, Dmitry Efremenko and Vladislav Larin, *An Environmental History of Russia* (Cambridge, UK: Cambridge University Press, 2013), especially pp. 100–6.
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Siddarth Kara, 'Is Your Phone Tainted by the Misery of the 35,000 Children in Congo's Mines?', *The Guardian*, 12 October 2018, https://www.theguardian.com/global-development/2018/oct/12/phone-misery-children-congo-cobalt-mines-drc.
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Giorgio Agamben, *Homo sacer: Il potere sovrano e la nuda vita* (Turin Einaudi, 2005), p. 185: 'Il campo come nómos del moderno.'
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Ibid.