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Around the Anthropocene in Eighty Names—Considering the Urbanocene Proposition

Franciszek Chwałczyk

Institute of Cultural Studies, Faculty of Anthropology and Cultural Studies, Adam Mickiewicz University in Poznań, 61-712 Poznań, Poland; franciszek.chwalczyk@amu.edu.pl

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Abstract: There are now at least 80–90 proposed alternatives to the term "the Anthropocene", following critique mainly from the social sciences. The most popular seem to be Moore's Capitalocene and Haraway's Chthulucene, but there are others, such as: Hornborg's Technocene, Mann's Homogenocene, Wilson's Eremocene, Stiegler's neganthropocene, Parikka's Anthrobscene . . . Furthermore, similar recognitions and critiques have been made in urban studies (Urban Age, Planetary Urbanization . . .). What should we make of this multiplicity? Those propositions are approached here from the philosophical and cultural studies perspectives, in the spirit of Galison's trading zones and Bal's travelling concepts. They are treated with engaged pluralism (introduced through geography and urban studies) and, because of their eschatological dimension, with (secular) negative theology. The Urbanocene is also outlined using Nowak's ontological imagination. None of the propositions are sufficient on their own. Most contribute to a better understanding of the Anthropocene. Those concerning the role of cities and urbanization (Astycene, Urbanocene, Urbicene, Metropocene) are insufficient. This entails that there is a need for an Urbanocene proposition to be formulated. This proposition draft is briefly outlined here by linking an example of exceeded planetary boundaries (levels of phosphorus and nitrogen) with urbanization, drawing on the works of Mumford and Gandy.

Keywords: anthropocene; urbanocene; urban age

This paper is an expanded version of a presented but unpublished conference presentation/paper [1].

1. Introduction

1.1. The Anthropocene—The Epoch of Man and Its (Urban) Context

What epoch do we live in? On a cosmic, geological or biological-evolutionary scale, time and its epochs are the objective external frame, and "man" is simply thrown into it. Is this really the case? It seems that not necessarily, not anymore—with the scale of "human" perpetration still increasing. Time scales and time units must also take into account this increase in impact—and its spatiality and arrangement. Especially given that this perpetration has just reached critical potential and it is not evenly distributed. Its effects and manifestations are noticed, variously demarcated and given a variety of names in different disciplines: global warming or climate catastrophe in climatology [2], the sixth mass extinction in biology [3], and, finally, the epoch of the Anthropocene in geology [4].

The Anthropocene is a much-discussed phenomenon and concept nowadays. As a phenomenon, it is the superhuman scale of perpetration, visible in and measured by, e.g., Planetary Boundaries [5]. As a concept, it is a postulate dating back to around the year 2000 [4], which designated a new geological era—as a part of the Holocene or as its end. The premise is that anthropogenic changes have occurred on a large scale on Earth. Their effects will probably be recognizable in future geological

strata, composed of matter we today produce and arrange; and social scientists or humanists would add that we produce and arrange this matter due to our cultures—the ways we live.

This proposition is currently being considered by the Anthropocene Working Group (AWG), composed of scientists of various affiliations—not only geological. Recently, the AWG recommended that the Anthropocene should be posited as taking place after the Holocene and beginning in the mid-20th century. As the clearest example of its indicator around the globe, the AWG postulates radioactive traces of nuclear weapons tests from the 1945 and onward [6]. It is now up to the International Union of Geological Sciences and the International Stratigraphy Commission to familiarize themselves with the AWG results and vote on the new name. However, like most issues in science, this proposal to view and name the new age as the Anthropocene is not limited to the field of science. In the meantime, doubts have been raised within and outside this field. Neither is the field itself homogeneous. Although this proposition of a concept describing an important phenomenon is needed, it is not sufficient from the perspective of other sciences. This is the basic point of departure of this article. I focus here on other suggestions for the name for the epoch—the other "-cenes". These are the alternative names (Capitalocene, Chthulucene, Urbanocene . . .) for the geological epoch—all of which have some justification. They are usually proposed as part of the constructive and creative critique of the Anthropocene-concept, but at the same time recognize the Anthropocene-phenomenon. Here I present all of the terms that I found (see Appendix A, Table A1) and I survey them to see what is missing or what is not adequately represented. This allows me to recognize needs and propose how to answer them, but not by just throwing my concept onto the table and cynically riding the wave of popularity of the concept without even considering what alternatives have already been proposed.

These discussions go much further, beyond the AWG, and turn out to be very lively, interesting and copious—as Ewa Bińczyk shows in her article in *The Anthropocene Review* and in her book [7,8]. She points out that this broad debate about the Anthropocene—involving most of modern science, but also media and business—is fundamental and unique for seven reasons, such as: it offers philosophical reinterpretations of the human's relations with nature; the scope of human agency and entanglement; and the triad of freedom, power, responsibility. It gathers and unites various disciplines around one subject and goal. Its central problem is irreversibility and unprecedentedness, shrinking possibilities and—resulting from this knowledge—mourning, anger and frustration. Hence, the debate has an eschatological dimension—especially as it is accompanied by apocalyptic motives. And it can serve as a (last) warning, as well as a catalyst for a new perspective—and, consequently, action and change. It may even wake us up from the "marasmus" of the Anthropocene, according to Bińczyk. Hence, if this is a fundamental phenomenon and a key debate, it should be thoroughly studied, but also extended to include sciences whose subjects the Anthropocene-phenomenon touches, but which the concept of the Anthropocene, geology and neighboring disciplines does not cover.

In the sense of a geological proposal, the Anthropocene (Anthropocene-concept) has already been discussed many times in many places and is not the main subject of this paper, while the Anthropocene-phenomenon and alternative concepts and names are. Such a demarcation of the research field is justified by the fact that geologists and related researchers understand the Anthropocene quite narrowly. However, their perspectives are expanding, as tables of contents and the contents themselves of various specialist publications show [9,10]. However, they mainly focus on what geological unit the Anthropocene is and when it started, where to drive a "golden spike". They do not necessarily take into account the possible political consequences of their findings. Meanwhile, their work on this concept has become very political, as is indicated by alternative propositions.

To put it simply, while geologists and like-minded researchers are interested in the geological side of the phenomenon, the "-cene", here the question is the "anthropo-"—the social side—or literally the humanist, anthropological side. Especially since it seems that this is currently the most fertile and most important subfield. In the case of research on climate change, the natural and technical aspects are already quite well understood and researched. The result is scientific consensus, reports like that of the IPCC (Intergovernmental Panel on Climate Change), and pretty accurate models [2,5,9,10]. Meanwhile,

the social and humanistic side is not so well developed. This is hardly surprising, considering that in the years 1990–2018 natural and technical sciences received 770% more funding for research on climate change than the social sciences. Only 0.12% of the funds were allocated to research on the social dimensions of coping with climate change [11]. In the present situation, the natural sciences can only tell us what is going on and why—with increasing detail—but only taking into account natural causes. Meanwhile, the main causes—as well as the solutions—belong to the social realm and, therefore, fall outside the scope of these disciplines.

As Kathryn Yusoff notes [12], Michel Serres already pointed out the global and "geological" impact of man on the Earth in 1990 [13]. This philosopher wrote about "dense tectonic plates of humanity" [13] (p. 16) affecting the world. In his book he pointed out that we need a new contract—analogous to the social one—but with nature, if only for nature to become a party, a (legal) subject, and for the harm that is being done to it to become somehow visible. As Serres puts it:

> " . . . being-in-the-world transformed into a being as powerful as the world. [. . .] This is the state, the balanced account, of our relations with the world, at the beginning of a time when the old social contract ought to be joined by a natural contract. In a situation of objective violence, there is no way out but to sign it.
>
> At the very least, war ["better" because codified, covered by conventions, noticeable, sometimes also "lighter" violence—ed. F.Ch]; ideally, peace"

[13] (p. 20).

The Anthropocene hypothesis and the discussions surrounding it seem to be an attempt and a possibility of such a new contract, at least for Bińczyk. As she points out, this concept, first of all, creates around itself an integrated, scientific systemic perspective on a planetary scale, without disciplinary divisions (Earth System Science—ESS). Secondly, it forces the recognition that humanity is in danger of losing the future and of triggering a cascade of disasters as a result of its activities. Thirdly, it introduces the idea of a planetary "we", the foundation for political change.

However, for this new contract not to end in the same way as many climate agreements—as a dead declaration or an act favoring the strong under the guise of technocracy—it must take into account a number of details and a great deal of complexity. Not only those concerning one side, the climate, but also the other, the "defendant", *anthropos*. That is because this "we" is strongly heterogeneous when it comes to distribution in space, vulnerability, degree of perpetration and many other features. Furthermore, this "we" that underlies constitutions and social systems usually turns out to be severely disabling for some (deliberately or not).

However, there is another aspect to this issue. In the same place, Serres draws attention to something that other authors did not take into account. As he writes:

> "Visible at night from orbit as the biggest galaxy of light on the globe, more populous overall than the United States, the supergiant megalopolis Europe sets out from Milan, [. . .]. It's a social unit comparable to the Great Lakes or the Greenland icecap in size, in the homogeneity of its texture, and in its hold on the world. This plate of humanity has long disturbed the albedo, the circulation of water, the median temperature, and the formation of clouds or wind-in short, the elements—as well as the number and evolution of living species in, on, and under its territory"

[13] (p. 16).

Hence the intuition that we should take closer look at the spatial perspective and, within this, especially at cities and urbanization. Christophe Bonneuil and Jean-Baptiste Fressoz note that while cities, pastures and fields occupied about 5% of the terrestrial landmass in 1750, today it is almost 30%. Furthermore, 84% of the land not covered with ice is today under the direct influence of *homo sapiens*, while 90% of photosynthesis on Earth takes place in biomes under its control—taking into account

biomes only partially influenced by humans [14] (loc 220). According to many estimates, over 50% of people already live in cities [15]. Eric Swyngedouw cites the following data: 80% of greenhouse gas emissions and most waste are generated by the current urban lifestyle [16] and other research corroborates such intuitions in certain aspects [17]. On the other hand—although also showing the considerable impact of cities—urban and industrial sulfur dioxide emissions have slightly limited the planet's warming in recent years [14] (loc 475). Elsewhere we can find reports that cities use over 66% of global energy and are responsible for 70% of the emissions [18]. Marina Fischer-Kowalski, along with her co-authors, tried to adequately and quantitatively describe how and when humanity acquired this global agency, focusing not on emissions, but on energy demand. As they write:

> "The functional inter-linkage with urban growth is apparent from the beginning: without a source providing heat for a rapidly increasing number of urban households and trades no proto-industrialization would have taken place. But even more so: on the global level, there is a near-perfect fit between urban population numbers and the amounts of fossil fuels used globally, across the next 500 years (see Figure 1)"

[19] (p. 20).

Not all population, but urban population. In their conclusions they state that since 1500 there has been a very close relationship between cities and fossil fuels.

Let us take a deeper look. In the long-term perspective it is cities that will leave a lasting impression on the face of the Earth (and beneath it). They will be this new geological layer, future fossils, as indicated by the head of the AWG, Jan Zalasiewicz [20]. A layer extremely diverse in composition, containing and concentrating matter from other layers, times and places. Perhaps the rapid urbanization that the world is experiencing now is another "sudden mineralization" in the history of life, about which Manuel De Landa wrote [21] (pp. 26–27). In this case, cities are nothing less than a human (exo)skeleton, a life-support system, as Matthew Gandy puts it [22]. If this is the case, then, just like the dinosaurs, man will also leave behind his great skeleton as remnants. It is not surprising that—as Jeremy Davies claims [23] (p. 102)—the post-war exponential growth of megacities was considered to be the "golden spike" for the Anthropocene. Hence, maybe it should be the Urbanocene, rather than the Anthropocene?

1.2. What Age, Which Man? The State of the Discussion and Problems Associated with the Urban Age and the Anthropos

As was already pointed out, according to many estimates, over 50% of people already live in cities [15]. But what does this really mean—if anything? Neil Brenner and Christian Schmid call this statement and its conceptual basis the Urban Age Thesis [24] (UAT, or "thesis" hereinafter). As those authors indicate, it is a long-standing and still dominant view when it comes to urbanization, population distribution and coverage of the surface of planet Earth. They compare it to the concept of modernity or modernization in the 1960s and globalization in the 1980s, just as Jason W. Moore compares the status of the Anthropocene today to globalization in the 1990s [25] (p. 80).

As with the case of the Anthropocene-concept, sufficient attention has already been given to the "thesis" in its various forms. At the heart of it is quite a big and extensive issue of what to understand as urban/city and how it changed, especially as figured in Modernist and Postmodernist discourses. However, I would like to focus on analogies between the Anthropocene-concept and the "thesis"—especially those regarding their problems and the need for rethinking them. As Brenner and Schmid show, sources of "thesis" should be sought in the Cold War attempts to more accurately measure the world urban population. The authors argue that although today, researchers use current data, at the same time the conceptual orientation, geographical imagination and representational strategies ("graphonology") have not changed a great deal since the 1950s.

Authors distinguish between statistical and theoretical problems with the "thesis". As for the former, there is a problem with operationalization of this "urban"—with determining and counting

what is and what is not a city (and, by analogy, a city resident). On the other hand, there are two main theoretical problems inherent in the "thesis". The first is methodological territorialism—the perception of social processes as closed and limited, occurring in strictly defined, non-overlapping spheres. Secondly, urbanization is treated here simply as a concentration of population in a given territory. A city is a homogeneous, coherent, discreet, unchanging, timeless container, detached from global processes. Borders are assumed rather than obtained as a result of research. This has three effects: the fetishization of settlement types, pitting the countryside and city against each other, and a "fluid" model of change—changes in space occur through transfer of population from rural areas to urban ones. Meanwhile, the countryside under this approach remains a black box. Here the problem lies in excessive territorialization, whereas in the case of the Anthropocene-concept it is the lack of such—in the sense of paying attention to space. At the same time, urbanization understood in this way is ahistorical and apolitical.

The effects of such reifying and depoliticized thinking are solutions from which politics is cut out and replaced by technoscience. Just as Bonneuil and Fressoz mention sustainable development as an old and standard response to environmental crises, and today to the Anthropocene [14] (loc 422–443 and 3845–3940), so it has a spatial counterpart (with its own set of violence) described by Swynegouw [26]. This is the majority of cities that are sustainable, smart, green, eco, zero-carbon, intelligent or resilient (or are labeled as such). Usually those enterprises solve problems only locally and for few—and can increase them on the global scale. Behind every intelligent building there can be a bloody coltan from Congo [27], e-waste villages in Asia [28] or CO_2 emissions associated with electronics and cement production (Congocene, Molysmocene, Anthrobscene …). What is more, these solutions are difficult to negotiate. One can either accept them and give most of the power to specialists and infrastructures or reject them. There is not much place here for the visions of a given community, its ideas, views and preferences, nor space for negotiations.

Similar veins of criticism apply to the Anthropocene-concept. This "we", this *anthropos* in the Anthropocene proposal, is one of the main problems that Bonneuil and Fressoz bring to the fore in their book [14]. They thoroughly examine the Anthropocene-concept and also propose and describe a number of alternative conceptualizations. It is due to the latter that their work is being used here as a main source of criticism for the Anthropocene-concept, although there is a lot of critique developing (for example, [29]). Additionally, because it is an excellent example of a critical approach to contemporary knowledge structures [30], I would say that it is an exploration of this "we" with respect to the natural sciences, but from the perspective and initiative of social sciences and humanities.

I will refer here only to selected threads of the critique of the Anthropocene-concept made by Bonneuil and Fressoz. As the authors point out, similarly as with UAT, the basic problem is operationalization. Because who is this *anthropos*? And what does his global responsibility look like? The authors point out that the average American from the US uses 32 times more raw materials and energy than the average Kenyan. A child born in a rich family will have a carbon footprint 1000 times larger than a child born in a poor one [14] (loc 1182–1244). And, after Alf Hornborg and Andreas Malm, they repeat the joke that an explanation indicating generally *homo sapiens* may be sufficient only for orangutans or polar bears asking who violates their habitats [29] (p. 6). Even if the numbers cited above are not accurate (which is difficult to confirm, for many reasons), they adequately represent ratios and relations. These inequalities are well summarized in the Oxfam report [31] and there are abundant data that legitimize similar conclusions [32].

Similarly problematic in the Anthropocene proposal is the explanation of where this situation came from. The approach to history is geological here, as if events were evenly distributed over sufficiently long periods of time, like accumulating rock layers. Hence, "exaggerating a little, we could say that history for anthropocenologists comes down in the end to a set of exponential charts" [14] (loc 1235) starting in 1945. This leads to formulating the Anthropocene in a similar way as UAT: ahistorically and apolitically. Meanwhile, the Anthropocene is a diverse socio-political-historical problem, not a geological, quantitative and demographic monolith.

This averaging, reducing and monolithic approach is an extrapolation and reversal of the slogan "We only have one Earth", which guided the UN ecological conference in Stockholm in 1972 [14] (loc 1062–1071). The effect of this reversal is a message that can be conveyed as follows: "there is only one cause and it is all of us". Of course, there is no doubt about the anthropogenic source of the climate catastrophe and most of the changes occurring. The problem, however, lies in the details and meaning of the term "anthropogenic".

This problematic symmetry between diagnosis and phenomenon goes deeper. The Anthropocene-concept seems to derive from the same source from which the Anthropocene-phenomenon came. This means the nature–culture divide, the "man vs. world" vision, and seeing nature as something separate and under man's influence [14] (loc 486–574), [25] (p. 80). It is a similar construction to that of UAT: urban vs. rural. Moore notes that this concept cannot answer the question "how did it happen?", because it is being hostage to the same cognitive structures that are responsible for today's situation [25] (p. 84). This also affects the proposed solutions that are subject to the same symmetry.

Just as the AWG identifies the Great Acceleration as the beginning of the Anthropocene, so Bonneuil and Fressoz see the sources of the above dualistic approach in the Cold War "optics". On the one hand, it is a vision and heritage of cybernetics and systems theory, quite universalizing, which also attempted to create a scientific perspective without disciplinary divisions. One can add the tools and effects of this optics: infrastructures that allow the diagnosis of the Anthropocene and climate change (radars, climatology and meteorology) can also be associated with this period and with the (cold) war context. The same applies to sources of the Anthropocene-phenomenon, as one can see in alternative propositions concerning the military and political sources of technology and energy infrastructures (e.g., Thermocene, Thanatocene, Necrocene, Technocene, etc.). On the other hand, it is the cultivation of a "glance from nowhere", initiated by the famous "Earthrise" or "Blue Marble" photos—gazing from space onto the planet and seeing it as a fragile Spaceship Earth. A ship that apparently needs the strong hand of a geo-scientist-pilot, who will guide her through this crisis. In the meanwhile, in line with this and the common approach, this crisis is automatically recognized as an opportunity [14] (loc 976–1021 and 1488).

This is how the defenders of everlasting growth and the proponents of a "good" Anthropocene [33] see it—as a transformation of the Earth and nature into a human garden, adapting those two to the economy, and not other way around. This is the way for William Nordhaus, the laureate of the so-called [34] Nobel Prize in economics. As he calculated in the 1990s, and still believes this is the case, economically-optimal global warming is 3.5 degrees Celcius [35]. The IPCC 2018 report sets the limit at 1.5 degrees, while 2 degrees is already a big ecological problem, to put it mildly [2]. However, according to Nordhaus, a bigger disaster (financial and detrimental to economic growth) would be to struggle to maintain the thresholds recommended by the IPCC. Nordhaus's and other good anthropocenologists' positions are a testimony to the cracks and crevices in the scientific community. As there is a consensus in disciplines dealing with the climate catastrophe on various scales (climatology and ecology), climate economists and geologists—especially those related to the oil industry—have doubts with which they "trade" [36]. These are the same geologists within whose discipline the Anthropocene-concept is being formulated and the Anthropocene-phenomenon is going to be named.

To describe this conceptualization and subsequent solutions, Bonneuil and Fressoz took inspiration from works of Michel Foucault. They propose the notion of geo-power and geo-knowledge (a succession to the bio- prefix), the subject of which is the whole Earth. In this framework, scientists are enlightened guides of the entirety of undifferentiated humanity and, similarly to the Cold War era, difficult to accept [37], potentially violent [38] climate engineering projects are proposed as solutions [14] (loc 1552).

Violence and coercion are indispensable elements of power, state and organization. However, their distribution remains a key issue. It is very likely that in order to save what we have understood as the Earth so far, we need some geo-power and geo-knowledge. Not only to make and sign a new contract with nature, but also to enforce it. The question is what values will stand behind this "legislation". The Anthropocene turns out to be a construct torn apart by conflict of interests. As long

as the discussion consists of different voices and its shape is not a foregone conclusion, indeed there are the potentials that Bińczyk wrote about. However, one must be careful about the moment of crystallization and reduction. For if we fail to take into account these critiques and this multiplicity, we will end up with a dysfunctional concept. A concept that will provoke pseudo-solutions, like the "green" discourse about saving the planet through consumer choices, not systemic changes. That is why it is so important to look closely into other propositions, alternative names based on alternative diagnoses, and to further develop those that are underdeveloped (such as the Urbanocene)—to be able to see the problem in its full complexity. Only then can we also have solutions multidimensional and complex enough to handle the situation.

2. Materials and Methods

As in philosophy and cultural studies, the materials that are on the table here are practices, ideas and their embodiments. I focus on propositions for an alternative name of the geological epoch (Capitalocene, Chthulucene, Urbanocene . . . —the "-cenes") that were somehow justified by authors. They are proposed as a part of the constructive and creative critique of the Anthropocene-concept, but they share the recognition of the Anthropocene-phenomenon and try to name it (or some aspects of it). I am not interested in the dismantling critiques of the Anthropocene (concept or phenomenon)—in those names that mock the idea of proposing alternatives or in propositions without any idea or recognition behind them.

For a list of all the propositions found as a part of my query, with the sources, see Appendix A, Table A1. Such attempts have already been made, but seem unsatisfactory. Either they were made some time ago and are not exhaustive [8], or they were conducted in a spirit of trivia and not exhaustively enough [39], or only listed names without providing sources [40]. Mine probably also misses many propositions, but it is still twice as extensive as others and no effort of this kind can be complete or closed. Every "-cene" used in this text can be found in the table, with a proper reference. I will not be citing them here, in the standard, bracketed way, as that would only make the citation system obscure.

As for the general approach of working with those concepts, I adopt a transdisciplinary way of practicing cultural studies [41], additionally inspirited by Science, Technology and Society studies (STS). On the one hand, it is putting oneself in the position of a "trickster" [42] or "Hermes" mediating between various disciplines and meanings [43]. On the other hand, it is taking tricksters, parasites [44] or boundary objects [45] as the main objects of interest (and also as methods, like travelling concepts [41]). This requires mobilizing a specific ability to capture and view subjects and their relations—the ontological imagination, as Andrzej W. Nowak calls it [46,47]. He retrofits C. W. Mills' famous concept and critically merges the STS approach with action-network theory.

This pluralism, metaphorics of exchange, wandering and circulation, as well as the subject of research, direct me towards a more specific perspective and justification for my research approach. One that is also a source for the aforementioned engaged pluralism [48]. To a large extent, what I do here can be considered a study of "trading zones" [49] and the co-production of such. This is a concept Peter Galison coined to explain how physics researchers were able to collaborate on specific projects and devices. These are spaces in which researchers locally coordinated and agreed upon their actions when, in a broader perspective, the meanings behind their actions or objects were conflicting or contradictory. The differences did not disappear in those zones; however, it can be said that a discrepancy report had been draw up and the attempt to put something together was continued. By exchanging theoretical, epistemological or technological objects, the sides agreed on the rules of exchange, although completely different meanings could been assigned by them to the objects exchanged. Those were not just simple exchanges—new procedures and qualities were being developed. I show how this applies to the "-cenes" in the *Results.*

There are two methods used here to recognize how the "-cenes" complement each other and to answer the question of whether there are any empty spaces. The first method was inspired by negative theology (discussed in philosophy by, e.g., Derrida [50] or Putnam [51]). The second inspiration was

the post-secular current of contemporary humanities and also the literally "supernatural" status of the subject being studied, the Anthropocene-phenomenon. Bińczyk emphasizes the eschatological dimension of the Anthropocene debate [7]. Bonneuil and Fressoz draw attention to the similarity of the structure of the Anthropocene narrative to the history of redemption [14]. Clive Hamilton writes about theodicy—in the case of this eco-modern, "good" Anthropocene [52]. Mark Sagoff, in a journal that can be regarded as representing the "good" Anthropocene approach, writes about "the theology of eco-modernism" [53]. Donna Haraway formulates her Chthulucene by referring to chthonic deities, underworld and rebirth, the beliefs of indigenous peoples, and proliferating and intertwining tentacles [54]. Mark Lynas describes the scale of influence of a collectively treated man as "divine" [55], and after Tomasz Majewski one can look for a way out of the marasmus of the Anthropocene in "secular holiness" [56]. By following these clues, proliferating and intertwining alternative names for the Anthropocene-phenomenon can be interpreted in this spirit. Then Capitalocene, Chthulucene, Urbanocene etc., are different names denoting various aspects or avatars of a given supernatural driving force. In speaking of a supernatural driving force, I do not mean a thing out of some spiritual order, but from a social one—spiritual and ghostly only insofar as it is the subject of *Geisteswissenschaften*. In this context, listing further propositions of names for the Anthropocene-phenomenon here, and indicating that they do not fully capture it, can be compared to and named as a (secular) negative theology.

I will show it here by means of an example, as it is a less established and described method and approach than other ones I refer to here (trade zones, engaged pluralism, ontological imagination). The question is: what epoch are we living in? Let us focus on the subquestion about responsible subjects—who is responsible? Then, is it the Anthropocene, the age of *anthropos*? No, because it is difficult to recognize all *Homo sapiens* as equally responsible. Maybe just one half, so an Androcene? No, it needs to be historically and geographically more contingent. Is it the Eurocene, because it was European culture and policies that led to colonization, the industrial revolution and the current situation? It is hard to hold Central and Eastern Europe responsible for that. Maybe the Sinocene, as the Chinese civilization is one of the longest lasting civilizations on Earth? However, they did not start a global industrial revolution or emit so much greenhouse gas (although they are catching up, even if producing for the West). Is it the Occidentalocene or the Anglocene, because most of the emissions were produced by the UK and USA and the West (or for them)? No, because it is hard to blame the poor from those countries for this condition. So maybe the Oligarchocene or the Corporatocene? Not really, it started and was caused by changes in mostly democratic countries, and not only corporations, but states were also responsible—and there were many oligarchies in history that did not end up causing changes on a geological scale. Maybe then we should use single figures as symbols, like the Trumpocene (to denote disregard of science and denialism), the Jolyoncene (as a statement about political elites) or the Alanthropocene (to acknowledge the participation of all "middle-class northerners")? Those are too specific. So maybe we should try to name it through a negation—is it the Polemocene, the epoch of the resistance against the environment degradation? But that only tells us about organized resistance in Europe or India, inside the centers, but what about the peripheries? Maybe then the Anthropo-not-seen, the epoch of forcibly adjusting and turning some cultures into the dominant ones (based on human–nonhuman division) and ignoring those other cultures, their possibilities and peoples? Etc. As one can see, this method does not allow us to name the epoch. However, it gives us some knowledge about it (of course when done more precisely than here, this is just an example).

The second method, the positive one, is "engaged pluralism", created by the philosopher-pragmatist Richard Bernstein and adapted by the economic geographers Trevor J. Barnes and Eric Sheppard [48]. This pluralism enables not only a dialogue between some approaches but also some progress. It differs from other pluralisms in that it "above all means stubbornly pursuing potential common ground" [57] (p. 297). It is a "navigation between the Scylla of multiple solitudes and the Charybdis of monism" allowing for "practices of hope" [48] (p. 194). As a result, the meeting of conflicting approaches should not end as these often end: with the division of the parties

and return to playing their "chmess" [58]. In response to criticism of his and Christian Schmid's Planetary Urbanization proposition, Brenner tries to apply it himself and encourages this way of discussion [59]. He also notes that it is an apt method for application in urban studies, where—as other authors note—"the main challenge is to not become paralyzed by notions of theoretical or empirical 'incommensurability'" [57] (p. 297).

3. Results

3.1. The Anthropo-Scene of the Neologismcene

The key feature of a trading zone is the development of a common contingent language. For Galison, referring to anthropology, those are kinds of pidgin languages (with proper conditions met—creole). "Anthropocene" and subsequent "-cenes" ("Capitalocene", "Chthulucene", "Urbanocene" ...), "planetary boundaries", etc. seem to be the notions and words of just such a scientific pidgin. One that is emerging at the junction of different disciplines dealing more or less with the Anthropocene.

When describing such a scientific pidgin, Galison firstly notes that it is a local language—specific to the applications it serves and the languages it combines. It only embraces what it needs and cuts off the wider context. Similarly, none of the participants in the Anthropocene debate knows all the knowledge necessary to fully understand this phenomenon. Its purpose is to name a new era, understand how we got here and counteract its dangers or, as Bińczyk calls it, the risk of losing the future. As dangers are multidimensional, so combating them must be interdisciplinary and coordinated.

Secondly, such a pidgin is time-dependent and embedded in a given moment. It is born from a need, develops and dies. For some time, research and debate about the Anthropcene-phenomenon has been growing, as well as discussion about the concept and alternatives.

Thirdly, it is a contextual language—one cannot try to understand it without taking into account the wider social and historical circumstances. In this case, Galison speaks of war (WWII, Korea, Vietnam), as it "throws people of different languages together" [49] (p. 50). The Anthropocene and the climate catastrophe are also being considered a war situation with a need for mobilization that reflects this—either by philosophical inquiry (as in the case of Serres) or due to the scale and seriousness of the phenomenon. At the same time, some alternative names for the Anthropocene-phenomenon (the Thanatocene, the Necrocene ...) point to its wartime specificity and sources.

Galison states that war is not the only socio-historical factor that shapes language. The other factor is power relations, where the stronger one usually provides the vocabulary and the weaker one the syntax. Here one can see why the debate around the Anthropocene-concept between the natural sciences or ESS, on the one hand, and the social sciences and humanities, on the other, is focused on one word, the name—and why debate within the natural sciences or ESS is not. To a large extent in the social sciences and humanities, working on the Anthropocene-concept involves either a different arranging of the "words", or arguments, of the ESS and the natural sciences, or trying to get our "vocabulary" included: in order to name some meanings and aspects that were not included and are important—to make the phenomenon more comprehensible.

Let us then take a look at the vocabulary of the Anthropocene trading hub. The propositions listed in Appendix A, Table A1, can be divided into three groups:

- The Meta-propositions are focused on the process of naming the new epoch and how this concept is being worked on and mobilized. Steve Mentz notes that although the name "Anthropocene" will stay with us, environmental humanists are doing everything in their power to make it plural. As he states, in the history of environmental humanities there may not have been a moment more abundant in the proliferation of neologisms—hence his (first) proposal, the Neologismcene. Jamie Lorimer also commends this multiplication by stating, "let a hundred -cenes bloom!", and describes it as the Anthropo-scene. Swyngedouw and Ernstson note some problems with the Anthropocene and the Anthropo-scene (depoliticization among both the natural sciences and new ontologies in humanities and social sciences) and try to counteract them, also naming it the

Anthropo-obScene. Kate Raworth draws attention to the question of who has the opportunity to name the epoch. To reflect the answer, she proposes two terms: Northropocene and Manthropocene, as the AWG consists mainly of men from the "global north" (Europe and the USA). Raj Patel, in turn, warns against the Misanthropocene. There are other propositions, but I will not focus on this category here.

- The Postulative Propositions focus on the current moment as a beginning of a new era whose shape is not yet determined. Therefore, they suggest what this new era should be like. They do not diagnose how we got here nor what will happen based on current trajectories—but are rather concerned with what should happen and how to get there. There are two main types here. The first ones, mainly originating from the natural and technical sciences, sustain or even further anthropocentrism. They advocate an escape forward and a leap into the future through technology and further change of the environment, etc. (e.g., Sustainocene, Good Anthropocene). The second ones, mainly originating from the social sciences, humanities and the art world, call for reorientation and rethinking of place and role of the *anthropos* in the world, the creation of new relations on a new basis, etc. (e.g., Chthulucene, Cosmopolocene, Symbiocene). I will not focus on this category here.

- The Diagnostic Propositions category is most numerous one. Here are all the propositions that name and describe the current situation, how it came to be and what lies ahead according to prospects and trajectories. There are many ways one can order this set. For clarity, I categorize them using the five W's and How heuristic—simple and basic, but a useful method in the field of collecting and organizing information. Those five W's are the following questions: Who? What? Where? When? Why? How? Of course propositions do not distribute evenly. There are not many that answer the "when" question (Paleoanthropocene, Early Anthropocene)—or, more accurately, they all answer this question but focus on aspects other than time. As an example I listed most of those answering the "who" question in the *Materials and Methods* section.

Most diagnostic propositions answer the questions "what" and "how", simultaneously. Thematically, they can be divided into three additional categories (at least two of which have already been discussed in one way or another in the context of the Anthropocene (e.g., [14])):

- The first ones are concentrated on the hyperagency of the *anthropos* and his dealings with anything deemed external (to society, to order, etc.). One can distinguish here a group of propositions focused on the loss of biodiversity and war on nature—let me use it as an example. Here is the Homogenocene (referring to the effects of Columbian Exchange), the Thatanocene (the story of achieving mastery in killing and later applying it towards the environment), the Pyrocene (concentrating on the importance and shaping role of fire control in the development of humanity) and the effect—the Eremocene (becoming a lone species on a once lush planet) and the Necrocene (linking death, war and killing with the Capitalocene).

- The second ones focus on the interior management, helplessness, futility, lack of power and agency and their production. Those propositions are about policing the order inside the local or global *anthropos* communities. Here the Econocene can be found (pointing out how the economy became the main episteme of the postwar period as well as the most important thing) and the Growthocene (focusing on growth as becoming the only possibility, compulsion even), the Phagocene (where consumerism serves as a means of pacification, but also as a motivator increasing the agency), the Agnotocene (concentrating on the deliberate production of the ignorance), the Trumpocene (pointing out the newest developments and figures of the Agnotocene) and the already-mentioned Anthropo-not-seen. In all of the phenomena described by such propositions, any "outside" (to society, to the accepted order of things, etc.) is being forgotten, hidden, covered or overlooked—as long as it serves and fulfills its role.

- The third ones are about the infrastructures of hyperagency and helplessness—for movement, transportation and translation between scales. Here the Anthrobscene is found, which tells us about

the functioning of the media and reminds us about their materiality and weight: how "clouds" need space and energy; how smartphones need coltan, are made by slave labor and end as e-waste. Those media also need a precise and secure environment to function [60] and are tools of the Agnotocene, as they allow filter bubbles [61], and as they are weapons of "math" destruction [62]. Those were more infrastructures of helplessness, but what about the ones for hyperagency? Those are being described under, e.g., the Thermocene proposition. This shows how the energy technologies progressed—not necessarily being better, but being more culturally and socially appropriate and better fitting into existing power relations. Adreas Malm points to something similar when subscribing to the Capitalocene proposition [63]. There are also propositions regarding the cognitive apparatus and way of seeing the world needed for creation, maintenance and governance. The Anthroposeen refers to a linear perspective, the Euclideocene to geometry, and the Simulocene to simulations and modeling in real time with causative feedback loops. Finally, there is the Technocene, where technology is characterized as magic (in an anthropological sense). It is a kind of social persuasion, mediated by human perception, but represented as independent from it. It results in an ability to move the work and liabilities onto someone and somewhere else in time and space. It also leans toward the Capitalocene.

Many propositions invoke the Capitalocene as an overarching proposition, so is seems to be the one answering the "why" question. This is not the time or the place to show why the Capitalocene proposition, although important and overarching, is still not sufficient on its own. The same applies to relating the Urbanocene to the Capitalocene. Urbanization appears in Moore's texts and books, but not as a significant actor. For example, as a synonym for proletarianization [64] (p. 250) or as an "earth-moving: urbanization, agricultural expansion, mining, and so forth" [64] (p. 87) process in opposition to the more important and underlying environment-making forces of capitalism. Moore points out that the industrial revolution took place in the countryside, not in the cities [64] (p. 150). Generally, in his argument he puts more emphasis on production spaces. Meanwhile, they do not exist without spaces of circulation, exchange and consumption—cities, in other words. Only in his later texts, inter alia after the works of Brenner and Schmid, does Moore recognize the role of the city as, e.g., a new frontier [65] (p. 22, footnote 12). It suffices to say that capitalism as we know it would not have developed without cites, as e.g., Fernand Braudel shows [66–68].

One should agree with Mentz and Bińczyk that "Anthropocene" is rather the only realistic candidate for the name—no other proposal has received such attention. As Bińczyk notes, one should appreciate the rhetorical power of this etiquette, uniting geologists, climatologists and others, and catalyzing the discussion around the topic. However, the reservations made in the second part of the *Introduction*—as to the actual state of this unity and as to the content of this label—remain valid. Bińczyk is aware of them, but due to her goals—focusing on the future—she believes that these problems would be difficult to eliminate [69] (p. 115).

Indeed, if we are to have a future, this cannot be the Capitalocene and all the subsidiary -cenes that got us here. It is already running out of margin and it must end. In turn, other proposals fail not in naming and defining the future, but the past—the Chthulucene is still only postulative. Here I see the possibility and need for the Urbanocene proposal. Constituting the city and urbanization as the major vehicles and sources of *anthropos* (hyper)agency, its restraints, and also the hubs of infrastructures managing is not only justified, but it may also have other benefits. It may allow not only to diagnose where the current climate crisis came from (concrete, localized practices and structures) and why it is so difficult to fight it, but also how to deal with it—on a proper scale: not individual, not global or state, but between and linking them, as cities do. However, before one can start to formulate such a theory, one must recognize the already existing accounts.

3.2. The Space "-cenes" and towards the Urban Frontier—The Astycene

Let us take a closer look at the propositions that consider space. The spatial dimension is not particularly intensively explored within the discussed Anthropo-scene. The first two spatial proposals,

the Plantationocene and the Euclideocene, were formulated as a part of the "Anthropologists talk" event with Donny Haraway, Anna Tsing and others [70]. They focus directly on the issue of space and spatial categories, but not satisfactorily enough. They show how space in the Anthropocene and the way it is perceived have been changing, and how these aspects are interrelated. However, they do not place the main causative factors in the dimension of space or the way it is organized.

The Plantationocene proposition refers to agriculture-slavery: of people, but also of animals, plants and microbes. The key issue here is the displacement of genomes, abstracting organisms or entire environments, the productive forces from their environments, and their implementation elsewhere—relocation for extraction. In that, it is similar to the Homogenocene, but when it comes to the broader framework, the authors refer to the Capitalocene. The other one, the Euclidocene, discusses the necessary conditions for the Plantationocene or the Capitalocene. To create ownership it is necessary to impose a grid on the world, to enclose space in frames and categories. The ability to separate and abstract from the world and its networks of relationships is also important. However, both of these propositions are rudimentary. The first one gained some attention lately (e.g., [71,72]). The second one was slightly developed, focusing on the linear perspective, but independently from the original, by someone else and under a different name—the Anthroposeen [73].

Other space-propositions are about the seas and oceans. The first is the Thalassocene, coined by Mentz in his book [74]. It is an attempt to write "the human history through and on the World Ocean, whose currents and storms shape exchanges of cultures, products, creatures and stories" [39]. The second is the AnthropOcean [75], focusing on venturing into the largest habitat on Earth and the issues concerning it. However, again: in both cases it is more a space where something happens or a space that is an environment of some processes, facilitating them or hindering, merely reactive, rather than a space that works, acts and even changes on its own, and has some agency.

Finally, we can focus on the propositions that indicate the way of spatial organization as an essential factor enabling human hyperagency on a geological scale and, as a consequence, the coming and naming of a new epoch. What is more, all such propositions diagnose cities and urbanization processes as key factors.

The Astycene was proposed in 2010 by Karen C. Seto, Roberto Sanchez-Rodriguez and Michail Fragkias [76]. The authors focus on the scale, pace, geographical coverage, form and function of modern urbanization and changes in land use. They note that although urbanization is a diverse process, the one that nowadays dominates and spreads is the sprawling, "American" model. It is also in urbanization, but in a different style, that they see the best answer to the challenges of global warming. This proposition links together a lot of research and knowledge about urbanization in the context of climate change and the Anthropocene, and through that it provides a whole battery of empirical and statistical arguments in favor of the reorientation from *anthropos* to a "townsman" as a main cause of the Anthropocene-phenomenon. However, it is just one article and does not offer an explanation or a mechanism of why cities and urban folk are the source of all of that agency. In fact, at a key moment the authors turn to "(a) increasing returns from innovation and productivity; and (b) economies of scale in energy use, carbon emissions, and infrastructure provision" [76] (p. 187), which are being tackled in detail by Santa Fe Institute researchers (here in Section 3.4.). However, the authors also note the need to take into account other factors (such as institutions, management and planning methods), not only spatial distribution and population growth physics.

3.3. The Metropocene—The Relations between Cities and Their Environments

The Metropocene was proposed by Mark Whitehead in 2014, in his book about the "where" of the Anthropocene-phenomenon [77]. This proposition is very close to what the theory of the Urbanocene should look like. The author's goal is to show the need to not only look into the depths and to include not only the geological dimension, "the future past", as an extrapolation of what is. He would like the present and the "width" to be taken into account—geography, environments, peoples, their psychology and cultures, and also possible changes and futures.

In the chapter dedicated to urban issues, Whitehead speculates that it may be helpful to consider our current geological period as the Metropocene—a period defined by the dynamics and needs of urbanization. He supports this with some statistics and by reaching back to the history of urbanization, to the conclusions of Lewis Mumford from "The City in History" [78]. Firstly, it is the special role of the city and the surplus of food that enable specialization, which in turn leads to the development of technology, which in general enables the emergence of the Anthropocene-phenomenon. Secondly, it is the creation of a new, "artificial" environment by the city that allows a distancing from the "natural" environment and managing it from a distance while using the obtained technological tools.

This is a good starting point, especially when Mumford's works about the connection between culture and cities are added to this [79]. However, Mumford's works on technology, from the early ones [80] to the late ones, synthesizing his approach [81,82], are getting broader and broader in scope, reaching a general frame, that amounts to his own philosophy of technology, based on the myth of the machine and the megamachine. Although it is useful as a frame, I am not so sure that it can be useful for the theory of the Urbanocene, because here one should trace how situated technologies work on a smaller scale—or rather, between different scales, traversing them. This is a question about the mundane components, crews and screws of Mumford's omnipotent and all-encompassing megamachines. On the other hand, what is missing in Mumford's frame is a certain psychological dimension or a nuanced representation of human entanglement in technology and space.

Like the previous authors, but after Mumford, Whitehead points out that there are many types of urbanization. Among them, he indicates the American type of spreading (sub)urbanization as fundamental for the Anthropocene-phenomenon. This diversity of urbanization also serves as his justification for why, when going on to theorize the city, he does not use the Chicago school, which focused on urbanization as a consequence of the internal properties of a closed urban system. He goes straight to David Harvey and to the processual approach to the city—a bundle of political, social, economic and relationship interests with capitalism. This dualism in approach and offered explanations—either internal factors, the (existing) city in itself and some of its properties, are the cause, or external ones are: urbanization determined and created by its contexts (usually capitalism)—is a recurrent theme among the attempts to link the planetary changes (the Anthropocene-phenomenon) with urbanization.

Finally, moving on to the relationship of urbanization with the environment, Whitehead proposes a possible model for these relations: the ecological Kuznet's curve. This is a bell-like or inverted U-curve. In this case, it represents the relationship between environmental degradation (vertical y axis) and the economic growth of the city (horizontal x axis). When a city grows (especially in the industrial age), it pollutes its surroundings—until it reaches a point where this trend reverts and the city begins to take care of its environment, and pollution decreases (especially in the post-industrial era). This change may be related to the strengthening of local governments and regulations, to the enrichment of residents and their disagreement with living conditions, or to the technological progress. In this version, the curve is practically no different from the classic Kuznet's curve. Both the original and the ecological ones were thoroughly discussed and assessed quite negatively, especially in the ecological context, as the Astycene proponents note [76] (p. 169).

However, here this curve is signed as "local/metropolitan scale". There is another curve in which there is no turning point. Even more: after crossing the tipping point of the former, the latter grows more. It is a pollution curve on a global, "external" scale. And here comes another, possible explanation of the shape of the first curve. At some point, it becomes more profitable to export pollution sources (heavy industry, etc.) outside to other, often cheaper locations, and to invest in and free space and workforce for office and management work. At that time, the city is still responsible for these emissions, because it is for its needs that they are emitted. Only they are emitted somewhere else.

Treating those two curves as a starting point, Whitehead also recognizes two possible directions for the urban in the Anthropocene. The optimistic one, which sees cities as a solution (Peter Hall, smart and new urbanism) and a pessimistic one, especially in the context of the global domination

of capitalism. In addition, after Hodson and Marvin [83], he notes that there is one more answer to the challenges of climate change, and it is the possibility of reinforcing and securing the cities. In the context of this and the climate disaster, it is worth recalling the question that Mike Davies asks in his classic text: "who will build the ark?" [84]. However, I am more interested in two other questions here, concentrated around those curves. The first one is: what if (or more like when) the "exterior" ends—either as a result of exhausting its limits, crossing Planetary Boundaries, saturating the environment, or as a result of planetary urbanization, or the internalization of the whole world? Secondly, what constitutes and sustains these curves—or the processes behind them? Those are the key questions of the Urbanocene, but one cannot find answers to them in the Metropocene proposition.

3.4. The (Santa Fe Institute's) Urbanocene—The Urban Event Horizon

Urbanocene is a name proposition mentioned by Geoffrey West in his 2017 book on scales [85]. Again, the proposition is not really fleshed out. That is why I will use other works by West and his colleagues—mostly Luis M. A. Bettencourt's [86,87]—to reconstruct what I call Santa Fe Institute's Urbanocene and present it here. Brenner and Schmid include this approach as a subtype of the UAT, technoscientific urbanism [88]. However, it partly exceeds the traps of the "thesis". Still, this is an approach with a very wide reach and considerable ambition. These researchers draw their conclusions on the basis of data obtained from many metropolitan centers of China, Japan, Europe and the USA. Bettencourt declares: "I show how all cities may evolve according to a small set of basic principles that operate locally" [87] (p. 1438). In other studies, they diagnose similar properties for pre-modern cities based on archaeological records [89]. Although this may be too big a generalization, on the other hand the modern urban network is quite strongly connected, internally, and its main nodes are similar. In addition, it can be simply treated as a different level of idealization than the one usually found in the social sciences (and what else to expect from physicists than grandiose generalization). That is why it does not include important internal differences within the city (class, race, gender ...). Bettencourt seems to be aware of the latter issue, as he points out: "It should be emphasized that the theory does not predict [...] socioeconomic differences inside the city, but the scaling for the properties of the city as a whole" [87] (p. 1441). However, it is possible to supplement and correct this approach, and its problems resulting from excessive simplification, with sociological and anthropological approaches; ones with higher resolution.

The city in this proposal is a container in which scaling effects occur and which provides a favorable environment for frequent and various social interactions to occur in it. There are two components to this effect: economies of scale and increasing returns for scale (referred to by the authors of the Astycene). These scaling effects mean that the values of many different measurable properties of the city (the production of patents, income per person or the total length of electric cables) are subject to a power law function. This function consists of the size of the population with scaling exponents, marked as β. These can be classified into certain classes, e.g., more or less than one.

The modeling done by those authors shows that for quantities reflecting the production of goods and services (GDP, salaries, crime rates, the spread of infectious diseases or even the speed of pedestrians' walking), i.e., the effects of social activity, this parameter β assumes values that are approximately 1.2 (more than 1, which means increasing the rate of return). For quantities related to material infrastructure, raw materials, etc., this parameter β takes values that are approximately 0.8 (less than 1, which means economies of scale). Simply put, when doubling the population, there is a slight increase in the social effects than would result from a simple doubling, and the consumption of raw materials and infrastructure increases a little less than it should. This translates to the dynamics of growth that somewhat accelerate with size instead of slowing down.

It is particularly interesting that one of the highest values—from 1.15 to 1.34—is reached by β for categories such as employment in Research and Development (R&D), the number of new patents, inventors, employment in the "super-creative" sector, and the number of R&D institutions. The special relationship between the city and technology (if to treat those as its proxies) shows up here again.

Bettencourt concludes his article by stating that cities can resemble various other objects with properties derived from the article:

"The most familiar are stars [. . .]. Thus, although the form of cities may resemble the vasculature of river networks or biological organisms, their primary function is as open-ended social reactors. This view of cities as multiple interconnected networks that become denser with increasing scale"

[87] (p. 1441).

However, this approach has two disadvantages. Cities are considered here in a vacuum, without relations with other cities and with their environment. At the same time, they are "flat" and black boxed. First, this happens on the ontological level, due to the assumptions and perceiving the city as homogenous. Cities are really like stars here, consisting of just a few layers and mainly being aggregates of hydrogen and helium. Of course, it should not be surprising that physicists dealing with social issues come up with such a star-model of the city. Secondly, it happens on the methodological level, by being interested only in the data on the entry and on the exit of the studied entity. This perspective focuses on and describes the interior, but treated as a whole and in a zone of contact with the outside—not deviating even a millimeter in or out. It is as if a black hole was being described, behind the event horizon of which nothing can be seen—or a black hole being treated as a two-dimensional being, and therefore its surface is examined and it testifies to what is happening inside.

Santa Fe Institute's Urbanocene shows that cities create pressure and where the specificity of cities lies. However, it does not show what the relations with the immediate and wider surroundings are, nor what is happening inside—or how the transition between different scales occurs and how the strengthening or weakening of the processes being relayed happens. Using the author's metaphors, but slightly changing the course, what is really interesting is to look at the city as a reactor. This one definitely has no homogeneous structure, but is a complex techno-scientific entity with many different subsystems, mental and material, human and non-human. From this perspective, the Santa Fe Institute researchers' approach focuses on the physics of the fusion itself and symbols on the blackboard. What should be taken into account is the casing of such a reactor, its closer and further socio-technical environment, crews, rods and fuel sources, its political frame, complicated pipe systems connecting different layers and the folds of insulation separating subsequent levels.

3.5. The Urbicene and Why not the Planetary Urbanization?

The Urbicene is a proposition put forward by Swyngedouw in one of his brief essays [90]. It is the second closest one to the themes and approach of the needed Urbanocene proposition—one that is being hinted at throughout this text and especially in the *Discussion*. However, the Urbicene is not really a name for why and how the Anthropocene-phenomenon occurred through cities and urbanization (the diagnostic category), and so it does not serve the purpose I am committed to here.

It is more a reflection on the Anthropocene-concept (the meta category): how much of the "scene" depoliticizes the issue and allows the status quo to be sustained and furthered. The author points out that even those critical new ontologies serve as a fuel for the accelerationist manifestos of hyper-modernization. The Urbicene is also a consideration upon the desirable and undesirable futures and ways of portraying them (the postulative category). The undesirable ones being the immunization frame, "smart", "sustainable" and "resilient" cities under techno-managerialism, with a focus on geo-social interventions as a means of continuing "business as usual". It is worth noting here that to fight for our planet we might need geo-social interventions; hyper-modernity with positive biopolitics [91]—maybe just driven by different axionormativity and under societal, political and democratic supervision, rather than market supervision.

Swyngedouw's analysis employs the apparatus of psychoanalysis and metaphors of immunology. Although such tools serve well at the meta level, it seems that they would not be so useful on the diagnostic level. I do not see the need to, or benefit from, bringing yet another epistemic universe,

one of biology and psychoanalysis, into this issue. Similarly to those new ontologies, these ones can also be easily twisted on the diagnostic level. Finally, urbanization in the Urbicene is capitalist, and it seems that all of its problems stem out from this fact. However, it is important to also look into urbanization itself, as cities preceded capitalism. They also allowed urbanization to flourish and had a great environmental impact before capitalism.

As for the proposition itself, Swyngedouw states:

"Planetary urbanization is of course the geographical expression of this anthropocenic process. Therefore, Urbicene might be a more appropriate term to capture the sociomaterial form that the Anthropocene takes"

[90] (p. 19).

Planetary Urbanization could be a good basis for this. However, from the perspective sketched in this paper, it is still somewhat lacking. Brenner formulates nine theses [92], which he later reformulates with Schmid to seven [88] and then explains in response to criticism [59]. For these authors, the key today is not the city, but the urbanization process—and therefore not the container, but what it is created by: relations and their dense networks. They repeat urbanism as a way of life, but now it is on a global scale. Urbanization is an uneven, dynamic, changeable, diverse and differentiating process. It was usually seen through the prism of agglomeration—the concentration of people, infrastructure and investment in some place against the background of a larger space. Now the emphasis is placed on different scales and distant areas, hinterlands and relations that put them into such "rural", "urban" and "dependent" categories.

According to Brenner, first of all, the urban is a theoretical construct, arising through theoretical abstraction. It is not an empirical, pre-existing object, place or space. I agree with the advised methodological caution resulting from this. Brenner emphasizes the importance of being aware of the theoretical background and its impact on the operationalization and research results. However, this declared nominalist approach and the resulting radical cut-off from reality is problematic. Other authors raised similar reservations [93], indicating that this concentration or even limitation to epistemology is not enough. Planetary Urbanization approach does not see the "ontological struggle"—that is, struggles with everyday life and around it, the production of knowledge at this basic level. Those are factors capable of emerging on the surface of events and initiating global changes. This ontological aspect is crucial. However, it is not easily discernible—it requires special imagination, as I already mentioned [46,47].

Too often, according to Brenner, the concepts related to or derived from everyday practices are turned into analytical categories without enough reflection. However, Brenner's postulate for separating "categories of practice" and "categories of analysis" does not seem feasible and desired. As one can see in the case of the Anthropocene, scientific concepts can and often are ideological, and end up becoming everyday notions. A large part of the struggle in trade zones and responsibility of science and scientists concerns the construction, saturation and introduction of those terms in such a way that they land in society in the most responsible manner. Such a struggle for discourse in science and beyond it is particularly important when—secondly, according to Brenner—the place and subject of science, here urban studies, are constantly being questioned, and when—thirdly—the main currents of science, here urban studies, fail to cope with the demarcation of their places and subjects and with the formulation of terminology and assumptions that would be sufficiently aware. No wonder then that they are strongly, though not necessarily intentionally, intertwined with other terminological circuits. However, this is not necessarily a bad thing, and it can even be useful. Again, as in the case of the Anthropocene and the attempt and need to generate a collective political and operational entity, that "we"—words and the circulation of meaning is a part of that.

In the fifth thesis [92], Brenner advocates giving up focusing on the typology of settlements and looking for what distinguishes the city from the rest ("nominal essences"). He proposes paying attention to the socio-spatial processes ("constitutive essences"), which are producing the various

urban and other landscapes of modern capitalism. The sixth point is that, however, it requires a new lexicon, because today it is no longer possible to talk about the urban–rural divide. As a consequence, and this is the seventh thesis, nowadays urban effects appear and continue in very diverse socio-spatial landscapes, not just urban ones.

At this point, Brenner also touches the topics of mentality and culture. The typologization he is so opposed to requires the mental actions of separation and sustaining divisions. Thanks to them, the uniqueness and essence of the given spatial and social form is being constructed, demonstrated and sustained. However, this is not just a scientific process; it is also a socio-cultural one. Not only because science is part of culture, but also because (more or less) the concepts and ideas from science pervade society and culture and go into wider circulation (and back). That is why Brenner also urges us to analyze the widespread urban ideologies through which we perceive something like the city and as a city—a separate and limited urban unit, the fruit and engine of progress—in opposition to the countryside or nature recognized as a self-regulating, closed, virgin and cyclical system.

However, recognizing a thing as such reproduces and creates it, making these divisions and objects as real as possible. Here I see another convergence with the Anthropocene and its alternatives. The processes described here by the Anthroobscence—the Agnotocene on the one hand, and the Euclidoecene and the Anthroposeen propositions on the other—are necessary for the Capitalocene- and the Anthropocene-phenomenon. The same applies to the Planetary Urbanization—it is also accompanied by a cover-up of its realities and basic conditions, on the one hand, and special ways of seeing the world on the other. Those are the roles of urban ideologies. They are not only symbolic, ephemeral, non-material. Brenner does not seem to fully take into account those performative, causative and creative powers. They are real, solid, material and causative, and they created cities as we know them. Again, one needs the ontological imagination here [46,47]. Were it not for the cultural sphere and objects present in it—this image of the city and its opposition to the world—the relations and flows described here in this form would be unsustainable. Similarly, maintaining these ideas and ideologies would not have been possible without the effort and appropriate scene: the props, the entire materializations of the urban iconography—walls, gardens, fountains, panoramas, and, e.g., collective portraits of the militia company from the 17th century Amsterdam.

Critics claim that Planetary Urbanization could very well be called "planetary capitalism" or the "global space-economy" [94]. The same could be said about the Anthropocene-concept, the Urbanocene or other propositions in the context of the Capitalocene. Yes, but only on condition that the urban aspect is not perceived as important and separate from capitalism—and therefore contrary to the authors. For they write:

> "We would insist, however, on distinguishing urbanization from the more general processes of capitalist industrialization [. . .]. As understood here, urbanization is indeed linked to these processes, but its specificity lies precisely in materializing the latter within places, territories and landscapes [. . .]. Capitalist industrial development does not engender urban growth and restructuring on an untouched terrestrial surface; rather, it constantly collides with, and reorganizes, inherited sociospatial configurations [. . .]. Urbanization is precisely the medium and expression of this collision/transformation, and every configuration of urban life is powerfully shaped by the diverse social, political and institutional forces that mediate it"

[88] (p. 172).

The problem I see here is the way of looking at the medium. Especially in connection with this "expression", it seems to be perceived here as pure and transparent, merely a carrier. I fully agree with such an approach to urbanization, but more in line with Friedrich Kittler's "city as a medium" [95]. In this case, after his successor, Marshall McLuhan, it is worth noting that "the medium is the message" [96]. The city is not only an expression, because it is not blank—not just capitalist even

when it is capitalist. Being a medium, it can be an amplifier, but also a resistor, dimmer or some other component. It has its own properties and agendas that it weaves into.

This medium problem connects with another issue. Brenner and Schmid are accused of completely giving up on the city—as a category and as an object. This is a partly understandable and substantiated charge, although excessive (the city exists here in the form of the effects of "concentrating urbanization"). It seems that they simply wanted to pay more attention to urbanization outside the traditional limits of the city. However, one can get such an impression when one reads that: "Apparently stabilized urban sites are in fact merely temporary materializations of ongoing sociospatial transformations" [88] (p. 165). The question that arises here is about the time scales of this appearance and temporality. Even at a non-geological scale, such an approach seems to be inadequate. Cities are not only seemingly stabilized and this temporariness, like a stopgap, can also be extremely persistent. The question is what does change. Even with high variability, after all, the structure, as in Theseus's ship, may remain.

This stability, a city as a secured stabilization environment, is strongly neglected in this approach. Again, using the electronics example—what matters is not just the speeds of radio waves and optical fibers, or the ephemerality of the "cloud". One should also remember about the cables on the ocean floors and physical locations of servers—e.g., in former silos for ballistic intercontinental missiles [60]. Those technologies need a stable microenvironment and security. A similar need is demonstrated by complex material–symbolic, human–inhuman, mental-bodily–out-of-body cultural infrastructures. I would not give up so easily on the "container" or "casing" perspective.

4. Discussion

So what could the Urbanocene proposition look like? A (very) simple, idealized model with an example can be constructed using and combining the research by Matthew Gandy and Lewis Mumford (about which, and the Urbanocene, I partially and briefly already wrote [97,98]). This is mainly a historical case, focusing on providing well-documented instances for the sketch of a critical model. Its main purpose is to show that the urban environment was already a key driver of past geophysical and ecological transformations and can still be today. But to show how exactly these observations translate into the modern, globalized urban environment (with its accompanying political-economic rhetorics and imperatives) as a key driver of present transformations would require a more detailed example and refined model, which are yet to come.

I will start with Mumford and his work on the history of natural urbanization [99]. The author tries to conceptualize urbanization, the city's relationship with the environment and its changes. Mumford distinguishes two perspectives (internal and external) and points out that the village and the city—usually pitted one against other—are actually the same. The former only lacks the size and complexity of the latter. What changes as one grows and what ultimately distinguishes the two entities—in the external perspective—are the relations of the settlement with the environment. In turn, the internal perspective focuses on the presence of an organized social core, the creation of a new environment (and subsequent ones), the relocation of the dwellers into it, and a loosening of the bonds connecting them with the previous environment. Now groups and individuals are being shaped according to the new environment and adapt to it.

In Mumford's view, as the city changes and grows, it becomes more and more independent from its surroundings and detaches from it. Put another way, it expands its surroundings to the point where the closest one is no longer so important and necessary. Until the local growth limits (obviously co-determined by the logic of growth) are exceeded, cities develop mainly through extensification, enlarging the surroundings. After exceeding these limits, development takes place, on the one hand through intensification, while on the other through penetrating into the extra-local space or into other cities, e.g., by subordinating them. Mumford illustrates this with an example of ancient deforestation around Rome or the impoverishment of the lands surrounding it because of connecting toilets through the sewers to the Tiber, which began a cycle of increasing imbalance. Important in this transition is the growing network of influence and its coverage—thanks to, e.g., roads and channel networks. The city,

from the container for the area (granary and wall), becomes a sluice controlling streams flowing from near and far and directing them towards itself, forming a catchment. Finally, it turns into a dam, concentrating and capturing flows, and the surroundings turn into a bayou.

Mumford mainly uses the example of the city's relationship with arable land. He shows how for a long time it is land around cities that is cultivated, the city consumes its fruits and fertilizes the land with the effects of the metabolism taking place in the city. Hence the best areas for intense cultivation were, e.g., in China, just under the walls, near the city—up until recently. Braudel also writes about this [66]. Gandy, in turn, describes the entire institution of the so-called "night soil collectors"—people who had the dangerous task of emptying latrines and cesspits (usually at night) and taking waste products to the surrounding fields.

For a long time, the fertility of the land was a condition of urban development and urbanization. Braudel cites calculations according to which since the eleventh century the urban center with 3000 inhabitants had to have around a dozen villages, i.e., an area of about 85 km^2 under its control [66]. However, meeting this condition and settling in fertile places led to a paradox. As the city grew, it covered that fertile land and its food needs increased. According to Mumford, in the United Kingdom in the 1950s cities occupied only 2.2% of the area, but this was more than half of the "first-class" agricultural land and one-tenth of the "good" land. In this situation, if the cities were to be only dependent on their surroundings, they would have had to stop growing or experience overgrowth, and fall.

However, hardy and durable cereal grains, pottery, and other tools, technologies and infrastructures enabled the city to draw food from afar. Fischer-Kowalski and co-authors model the dependence of the urban development of this period on means of transport and food availability [100]. These measures allowed cities to grow further and occupy arable land all around, and gave them excess time and energy to manage. When combined with other factors this resulted in the possibility of the emancipation of the city from its immediate surroundings.

The ultimate effect is the "ghost acres" that Bonneuil and Fressoz write about when discussing the Capitalocene [14] (loc 4206, 4256, 4505). These are areas that were directly or indirectly occupied—which was necessary for the European powers after exhausting their own territory (or its efficiency). Thanks to them, those powers can sustain themselves. What is more, not only the fruits of these acres are being imported, but also the fuel for the native acres. Bonneuil and Fressoz describe the dependence on guano mines in Peru, Bolivia and Chile, and phosphorites in Tunisia, Morocco and Algeria [14] (loc 4250), and Brett Clark and J. B. Foster present a similar analysis [101]. However, as can be seen above, this mechanism of dependence can be reconstructed at the urban level—lower than the state level, although still with global reach. It is also worth remembering the key role that cities played in the foundation of states and empires [66].

In turn, these surpluses and released resources were crucial for the development of technology, for which cities play a central role. This is indicated by Mumfrod or by the discussed Santa Fe Institute studies. At the same time, the fruits of this development further enabled the obtainment of these surpluses, releasements and changes. They allowed, for example, intensification, instead of complementing the extensification. In agriculture this is the case of "natural" and "artificial" fertilizers.

There is a contemporary version of this expansion, invasion of the non-local space, extensification or obtainment of the "ghost acres". One can consider as such the global land grab progressing after 2007, following the financial, fuel and food crises. These are mass expropriations and buyouts of land on a global scale for the cultivation of food, biofuels, fiber crops etc. (palm oil, soybean, wheat, rice etc.) [102]. The main buyers are China, one of the most urbanizing nations, and highly urbanized countries (Japan, the United Arab Emirates, Saudi Arabia, South Korea), all trying to secure their position. The purpose of these purchases is to control resources (land, water) and the benefits stemming from them—to subordinate and draw them into the orbit of global, large-scale circulation. This is to "link extractive frontiers to metropolitan areas" [103] (p. 4).

On the other hand, there is intensification. As discussion revolves around the topic of land, soil, agriculture and water, in this case it will be only natural to talk about natural and artificial fertilizers. Especially since this is one of the four significantly crossed Planetary Boundaries [5]. This is a fairly classic thread, referred to as metabolic rift in the literature (especially from a Marxist perspective [104], but also more broadly [105]). Moore [106] and Bonneuil and Fressoz [14] (loc 3297–3373) also explored this topic. Discussing and combining changes in nitrogen and phosphorus circulation with the replacement of excrement as fertilizer with artificial ones, Bonneuil and Fressoz write about urbanization as an important but rather secondary process. In addition, they write about it in the simplifying spirit of UAT: "urbanization, i.e., the concentration of the population and their faeces . . . " [14] (loc 3297). This view of the city as "only" the concentration of humans and their feces, the effects of their metabolism, does not take into account the networks on which all of it depends, or the emergent processes which may result from the distribution of actors in space and this concentration.

Parallel to Mumford, it is now worth recalling Gandy's research and model (similar in some aspects). He is studying urban public health policies, born of the need to keep bodies healthy and extinguish outbreaks of disease [107]. Gandy analyzes changes in those models, sets of standards, practices and their infrastructures.

First, he distinguishes a pre-industrial organic model, based on cycles and a compact city (similar to the one in early phases that Mumford described). "Nature" is just behind the walls; it runs an exchange with its surroundings and is aware of it. At one point, however—when and where a number of conditions are met and are favorable—it turns into a differentiating and spreading "bacteriological" model. In its creation and existence, an important role is played by the "technical rationalization of space"—the perception of urban space (and not only) as homogeneous and coherent [108]. However, it is not only this—the bacteriological city was created due to many factors, such as specific mental and material infrastructures:

> "Advances in the science of epidemiology and later microbiology which gradually dispelled miasmic conceptions of disease; the emergence of new forms of technical and managerial expertise in urban governance; the innovative use of financial instruments such as municipal bonds to enable the completion of ambitious engineering projects; the establishment of new policy instruments such as the power of eminent domain and other planning mechanisms which enabled the imposition of a strategic urban vision in the face of multifarious private interests; and the political marginalization of agrarian and landed elites so that an industrial bourgeoisie, public health advocates and other voices could exert greater influence on urban affairs"
>
> [109] (p. 365).

The biopolitical nature of the modern city is associated with the dissemination of hybrid relationships of the body, nature and urban space, physiology and infrastructure [22]. Gandy focuses on the example of water circulation as the main one, showing the degree of incorporation of man into the city and his regimes. At the same time, this rationalization did not mean a transformation of only the physical structure of the city and areas far beyond it, but also mental and cultural ones. Those are, for example, the public and private space divisions, hygiene and washing regimes and their evolution—e.g., the change of attitude towards public washing places with the appearance of the bathroom and new standards [107]. At that time, human excrement changed its meaning and perception. From the "night soil", something important for agriculture and ordinary in the organic city, it turned into faeces—something disgusting that needed to be hidden.

Finally, a technological and strictly urban thread needs to be included here; one completely omitted by Moore and almost entirely by Bonneuil and Fressoz [14] (loc 3135, 3745). One that is crucial from the point of view of Mumford, Gandy and the Urbanocene proposition. It is the invention and implementation of a technical infrastructure, namely the sewage system, and with its help the reconstruction of urban naturocultures, overcoming some limits and creating others. Its creation

was a direct result of the expansion of cities and the need to overcome related problems. As the city grows, the amount of water falling on it during rainfall increases. At the same time, the possibilities of absorption (built-up area) and drainage are decreasing (although the city grows, the streets do not get significantly wider). In the event of heavy rainfall, the streets of a large city without a sewage system turned into rushing rivers. Sewerage was originally created primarily for the drainage of storm water, not faeces. What is more, this idea was opposed. Using the example of Paris, Gandy shows two positions from which the option of connecting and flushing the effects of human metabolism were opposed [110]. Baron Hausmann could not imagine letting feces into his mains, the miracle of the Second French Empire considered an achievement equal to Rome. On the other hand, ecological and economic concerns were flourishing: the dilution and loss of nitrogen, so important for agriculture and the army, was considered a real threat. Similarly, those fears are mentioned by Bonneuil and Fressoz [14] (loc 3339). On the other hand, due to the expansion of the city, the output of night soil collectors was drastically falling. It became difficult to take all the waste matter from the city to the more and more distant fields before dawn. Meanwhile, as a result of the development of science, technology, commerce and imperial policy, alternative sources of food or fertilizer were sought and provided.

However, as Gandy notes, the appearance of these opposing voices testifies to the continued existence of cyclical, premodern thinking in the (supposedly) modern, rationalist order. It was sewerage and artificial fertilizers that were ultimately to change this—along with a number of other physical manifestations of the reconstruction of urban space into a more "rational" one, which were conducive to management and control. This created a new, metropolitan attitude to "nature": from a direct partner in the waste–fertilizer–product cycle, a material necessity, the environment, it changes into a landscape, a remote source of pleasure and rest. On the other hand, it still remains a material base, but a hidden one—and is exploited even more. Agriculture disappears from the eyes of downtowners into the provinces or colonies—just as chamber pot contents disappear in the hole and underground.

Due to the rapid expansion of the hinterlands on a global scale and beyond the boundaries of imagination, they seemed potentially infinite. In other words, these are (already described here by Mumford) changes in the settlement's relationship with the environment through the creation of a new one, and a loosening of the bonds connecting dwellers with their previous environment. It is plumbing, hygiene and the new circulation of waste and fertilizers that trigger an increase in imbalance, which progresses, expands and self-propels a decrease in mortality, an increase in population and in food needs, a decrease in the availability of natural fertilizers, an increase in the acquisition and production of artificial ones, and their deposition in the environment.

The effect of this cultural mental–material change is the possibility of (seemingly) unlimited growth of cities—assuming the maintenance of logistics lines and the opening of new hinterlands. They can be in space, in the form of new lands for cultivation or in time, through technology. Such a role can be played by new technologies, acreages or ways of using energy or matter accumulated over time, as in the case of fossil fuels or fertilizers. These are guano mines on the Pacific Islands, superphosphates created by treating bones with sulfuric acid or phosphate rock mines, with limited and decreasing deposits. For nitrogen, unlike phosphorus, one can determine the end point and also the triumph of this logic, the discovery of the "infinite" source—the Haber–Bosch method: obtaining nitrogen from the air. Nitrogen and phosphorus are no longer circulating between the city and its fields. One is dug up and the other is pulled literally out of thin air. Then, in excessive quantities, they are used in global fields to feed the metropolises. Finally, they flow into oceans that are unable to process this rapid accumulation. This may lead to excessive eutrophication, flowering, and to significant deterioration of ecosystem parameters. This is a new limit created by the new circumstances.

The basic problem now is the limited size of the globe. The local urban–rural cycle has scaled into a global dimension. However, although it seemed otherwise, it did not lose its cyclical character. This is now a problem, when the disposed disorder is not able to decompose and recycle in the environment and it begins to return and break down the order. The outside, from whence the disorder came and to whence it returned, is starting to disappear—it is no longer possible to treat even the geological layers,

the atmosphere or oceans as the exterior. The inability to remove disorder causes it to grow inside. Especially since the whole planet has been internalized (urbanized). How to resolve a situation like this, where the exterior is no longer the source of disorder and a place to dispose it?

One of the possibilities—amplified by the Capitalocene—is the creation of spheres of disorder in the interior. Such spheres of disorder can be created in the form of, for example, zones of indistinction, about which Gandy [107] writes (being critically inspired by Giorgio Agamben's philosophy). In this context and in relation to models of urban public health policies, apart from the two models already mentioned here—organic and bacteriological—Gandy distinguishes the third one, which is dominant today: antibiotic [109]. It is an individualized health regime—instead of building collective resistance, biopolitical "care" for bodies and entire organisms, these are individual (antibiotic) therapies. He discusses this more deeply with the example of water—e.g., a common retreat from "taps" towards bottled water. One can think of another illustration here: instead of the walls around the city and services in it—gated communities, all of those smart, resilient or sustainable enclaves.

Translating this into the example discussed here so far, urban agriculture comes to mind as an illustration. The need for the internal sourcing of food ceases to be just a memory of wars and occupation [111] or the local post-apocalypse, as in the case of Detroit [112]. It becomes a vision of the future: balcony gardening [113], green roofs and roof gardens, urban greenhouses and vertical crops [114]. Perhaps in the future New York will indeed be able to (or have to) feed itself [115] and clean itself [116]. All those technologies, bundled into bigger infrastructures, now labeled as smart, resilient and sustainable by some, could become as transformative and powerful as sewers were. The problem is, firstly, what new limits will they create by overcoming the existing ones? Secondly, who will get to be plugged into this new network, and who will be forcefully separated?

At any rate, it has happened in history that the outside of the city disappeared for some time—e.g., during sieges. It is significant and very interesting that when considering the city's situation in the Anthropocene, an interdisciplinary team of researchers—having similar issues in mind—took interest in Constantinople [117]. They argue that this city has survived 2000 years and many plagues, crises and sieges (including the longest one lasting eight years) thanks to the organization, management and sustainment of the possibilities of such internalization. For example, a large space on the inside of the walls was dedicated to possible crops. Moreover, according to the authors, in its glory days in the early Middle Ages, Constantinople resembled modern cities in many respects. It was the earlier collapse of global logistics that meant that it had to find itself in a new situation. Therefore, the authors suggest that Constantinople may be a source of inspiration, knowledge and experience for the future.

5. Conclusions

In this way, by combining the macroscale effects of collective, urban *anthropos* with the microscale of urbanism as a way of life, the livelihood of individual urban dwellers and their groups, it is possible to take into account (although here briefly and superficially) different dimensions: the city as one big perpetrator; its internal complexity, relations and transformations; and infrastructures and mechanisms, by means of which the impact and changes are taking place (and feedback is coming back or is forcefully stopped). Further research and formulation of the Urbanocene proposition should focus on the three dimensions distinguished here in the *Results 3.1.*, and on an expanded expression of how the Urbanocene is manifested across contemporary urbanalities. The first triad showing that new proposition should not only be diagnostic, but also postulative and self-aware (especially in a political context). The second triad shows what dimensions it should cover—the external, the internal and how they are being constituted and linked or severed; what kinds of settlements or cities—infrastructures bundles—produce what kind of divisions into the interior and exterior, into heavenly city arcades supported by the backstage hell of modernity, to put it in Walter Benjamin terms [118]. What is their order, what is their needed and unwanted disorder? All while remembering to balance between the external (e.g., capitalism) and the internal explanations (e.g., panuniversal properties of cities). All of this extends between the macroscale of planetary urbanization and the Anthropocene-phenomenon

and the microscale of urban dwellers' environments, their actions, cognition and praxis—with many scales in between. What links different scales are infrastructures, and that has to be studied—there are already some good starting points [119–122] and more are being pointed out and emerge [123–127].

For one final remark: as one can see, it is not necessary to use capitalism and its processes here to connect at least part of the socio-culturo-economic causes with global, ecological effects and to show how this frame is produced at all. That is why Mumford may carry out a similar analysis for ancient Rome—of course on a slightly different, more local scale. This is also why one can explore the cities of former and current socialist and communist countries using this frame. Although using Moore's frame is not necessary, it is very useful as a complementary one. The same can be said for the other 91 frames—some more, some less. For, I repeat, none of these propositions alone is sufficient to name or explain the Anthropocene-phenomenon.

Appendix A

As this is research material, a dataset for this paper, I do not find it suitable to cite those positions in the same fashion as other references in this text. For the sake of clarity, for positions in this table I give full bibliographical address inside the table and not in the ***References*** section. Along with the proposed alternative names I provide a references: to the first formulation of the name (or to a couple of them—when they were formulated independently), to the most elaborated take on the proposition, to some mix of those or to the only one source I could find.

If you are reading this and know about some other "-cenes" not listed here—and any source or reference for it—please be so kind and send it to me: f.chwalczyk@gmail.com

Table A1. "-cenes".

No.	Name	Sources and References
1	Aerocene	• TED. Saraceno, T. Would You Live in a Floating City in the Sky? 2017. Available online: https://www.ted.com/talks/tomas_saraceno_would_you_live_in_a_floating_bubble_in_the_sky (accessed on 10 April 2020). • Aerocene. Available online: https://aerocene.org/ (accessed on 10 April 2020). • Aerocene. Available online: https://studiotomassaraceno.org/aerocene/ (accessed on 10 April 2020).
2	Agnotocene	Bonneuil, C.; Fressoz, J. B. *The Shock of the Anthropocene: The Earth. History and Us*; Verso: London, UK, 2016.
3	Alanthropocene	Network in Canadian History & Environment. MacEachern, A. The Alanthropocene. 2018. Available online: http://niche-canada.org/2018/01/15/the-alanthropocene/ (accessed on 10 April 2020)
4	Alienocene	ALIENOCENE Journal of the First Outernational. Neyrat, F. Available online: https://alienocene.com/what-is-alienocene/ (accessed on 10 April 2020).
5	Androcene	Salleh, A. *Ecofeminism as Politics: Nature, Marx and the Postmodern*; Zed Books Ltd.: 2017.

Table A1. *Cont.*

No.	Name	Sources and References
6	Anglocene	Bonneuil, C.; Fressoz, J. B. *The Shock of the Anthropocene: The Earth. History and Us*; Verso: London, 2016.
7	Anthrobscene	Parikka, J. *The Anthrobscene*; University of Minnesota Press: Minneapolis, 2014.
8	Anthrocene	Anthropocene Magazine. Revkin, A. (2016/1992) An Anthropocene Journey. Available online: http://www.anthropocenemagazine.org/anthropocenejourney/ (accessed on 10 April 2020).
9	Anthropo-not-seen	E-Flux Journal 56th Biennale. De la Cadena, M. (2015) Uncommoning nature. Available online: http://supercommunity.e-flux.com/authors/marisol-de-la-cadena/ (accessed on 10 April 2020).
10	Anthropo-obScene (/Anthro-Obscene/Anthro-obscene)	Swyngedouw, E.; Ernstson, H. Interrupting the anthropo-obScene: Immuno-biopolitics and depoliticizing ontologies in the anthropocene. *Theory, Culture & Society* **2018**, *35*(6), 3–30.
11	Anthropo-scene	Lorimer, J. The Anthropo-scene: A guide for the perplexed. *Social studies of science* **2017**, *47*(1), 117–142.
12	AnthropOcean	Brugidou, J.; Fabien, C. 'AnthropOcean': Oceanic perspectives and cephalopodic imaginaries moving beyond land-centric ecologies. *Social Science Information* **2018**, *57*(3), 359–385. https://doi.org/10.1177/0539018418795603
13	Anthropocene	Crutzen, P. J.; Stoermer, E. F. The Anthropocene. *Global change newsletter* **2000**, *41*, 17–18. https://doi.org/10.1038/nature09678
14	Anthroposeen	Lepenies, P. The Anthroposeen: The Invention of Linear Perspective as a Decisive Moment in the Emergence of a Geological Age of Mankind. *European Review* **2018**, *26*(4), 583–599. https://doi.org/10.1017/S106279871800042X
15	Aquatocene	Robertina Šebjanič. Available online: https://robertina.net/aquatocene/ (accessed on 10 April 2020)
16	Atomicocene	University of North Carolina Press Blog. Lindsey A. Freeman: Anthropocene, Capitalocene, Cthulucene, Atomicocene (2015). Available online: https://uncpressblog.com/2015/04/23/lindsey-a-freeman-anthropocene-capitalocene-cthulhucene-atomicocene/ (accessed on 10 April 2020).
17	Astycene	Seto, K. C.; Sánchez-Rodríguez, R.; Fragkias, M. The new geography of contemporary urbanization and the environment. *Annual review of environment and resources* **2010**, *35*, 167–194. https://doi.org/10.1146/annurev-environ-100809-125336
18	Betacene	The Society for Cultural Anthropology. Howe, C.; Pandian, A. (2016) Introduction: Lexicon for an Anthropocene Yet Unseen. Available online: https://culanth.org/fieldsights/introduction-lexicon-for-an-anthropocene-yet-unseen (accessed on 10 April 2020).
19	(Billion) Black Anthropocenes	Yusoff, K. *A Billion Black Anthropocenes or None*; University of Minnesota Press: Minneapolis, MN, 2018 https://doi.org/10.5749/9781452962054
20	Capitalocene	• Moore, J. W. Capitalism in the Web of Life: Ecology and the Accumulation of Capital; Verso Books, 2015. • Malm, A. Fossil capital: The rise of steam power and the roots of global warming; Verso Books, 2016.
21	Chimpocene	Langlitz, N. Primatology of Science: On the Birth of Actor-Network Theory from Baboon Field Observations. *Theory, Culture & Society* **2019**, *36*(1), 83–105.
22	Christocene	Northcott, M. S. *A political theology of climate change*; Wm. B. Eerdmans Publishing, 2013.
23	Chthulucene	Haraway, D. *Staying with the trouble: Making kin in the Chthulucene*; Duke University Press, 2016
24	Congocene	De Groof, M. Congocene: The Anthropocene through Congolese Cinema. In *Opposing Colonialism, Antisemitism, and Turbo-Nationalism. Rethinking the Past for New Conviviality*; Gržinić, M.; Pristovšek, J.; Uitz, S., Eds.; Cambridge Scholars Publishing: 2020; pp. 88–111.

Table A1. *Cont.*

No.	Name	Sources and References
25	Corporatocene	• Schneiderman, J. S. Naming the Anthropocene. *philoSOPHIA* **2015**, *5*(2), 179–201. • Colebrook, C. What is the Anthropo-political. In *Twilight of the Anthropocene Idols*; Cohen, T.; Colebrook, C.; Hillis Miller J., Eds.; Open Humanities Press: London, 2016; pp. 81–125.
26	Cosmopolocene	Delanty, G.; Mota, A. Governing the Anthropocene: Agency, governance, knowledge. *European Journal of Social Theory* **2017**, *20*(1), 9–38.
27	Cyanocene	Sagan, D. Coda: Beautiful Monsters: Terra in the Cyanocene. In *Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene*, Tsing, A. L.; Bubandt, N.; Gan, E.; Swanson, H. A., Eds.; University of Minnesota Press: Minneapolis, 2017; pp. 169–174.
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