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## Architecture

Emeline Curien and Mathias Rollot

Abstract Only considering that the building sector generates nearly 40% of annual global CO<sub>2</sub> emissions (UN Environment, IEA. Global Status Report 2017, 2017) may probably be enough to justify the presence of an « architecture » entry in this Handbook of the Anthropocene. Yet this article broadens the question to clarify both what is behind the complex concept of « architecture » and in which sense it may be a key point if «our job is to make the Anthropocene as short/thin as possible » (Haraway D. *Staying with the trouble: making Kin in the Chthulucene*. Duke University Press, 2016: 100). Assuming it is not « too late », the article will then try to show how architecture, despite its disastrous past achievements, could paradoxically become a fantastic way to shape truly ecological societies.

First of all, if architecture should matter today, it is because of its very large ecological impacts (if « architecture » is understood in the sense of the building/ the built environment), as much as its ecological responsibilities (if « architecture » also means the work of architects and the architectural discipline). A good way to understand these issues is probably to consider the concrete age we have known for a century. Energivorous to produce, but also almost impossible to recycle, concrete has been recently characterized by *The Guardian* as nothing less than « the most destructive material on Earth », for its CO<sub>2</sub> emissions but also for the water, sand and corruption issues it generated this last decades worldwide (Watts, 2019).

Concrete would also be easy to accuse for the architectural, functional and aesthetic uniformization that took place worldwide, often against the « art of dwelling » of vernacular local cultures (Illich, 1992), the artisanal know-how and local bio- and geo-sourced low-tech activities. Yet, as Vaclav Smil noted in his seminal *Making the Modern World: Materials and Dematerialization*, « perhaps no other comparison illustrates the scale of this concretization better than this one: consumption of cement in the USA totalled about 4.56 Gt during the entire twentieth century – while China emplaced more cement (4.9 Gt) in new construction in just three years between 2008 and 2010, and in the three years between 2009 and 2011 it used even more, 5.5 Gt (NBSC, 2013). » (Smil, 2014: 132)! A clear comparison that perfectly shows both how the problem isn't the same worldwide, and also how it tends to become more and more problematic as the global acceleration goes on.

Yet concrete isn't the only responsible for the current architectural impacts and responsibilities, as far as the vertiginous set already built by the anthropogenic

western cultures is also based on a considerable sum of junkspaces – in the sense that architect Rem Koolhaas gave to this term: a short-term, cheap and easily replaceable construction, that configures space as sealed packaging, always interiors and disconnected from the terrestrial multiple realities by technical means such as air conditioning, artificial light or elevators (Koolhaas, 2000). May it be shopping centres, airports, hospitals or night-clubs, junkspaces are all built with many « junkmaterials » that are neither sustainable nor durable; nor qualitative nor recyclable. It's quite not a surprise that the « modern-liquid » era (Zygmunt Bauman) transformed architecture in such a consumable industrial space-product, at least for who may agree with philosopher Günther Anders remarking that « production lives from the death of the single product (which has to be purchased again and again). In other words, the 'eternity' of production rests on the mortality of its products » (Anders, 1956: 91). Architecture is no exception to the rule, as its now fully following the whole industrial economic system based on the fact that production design its products as the wastes of tomorrow, production is a waste production. Yet the main problem with edification being the size and the quantity of the products. As each junkspace only serves for a very limited time before being old-fashioned or becoming obsolete (Tischleder & Wasserman, 2015), from its birth it already represents tons of pollutant composite chemical materials, whose only destiny is to be « thrown away » – forgetting that, in a biospheric perspective, « you can't throw anything away because there is no « away » » (Sale, 1985: 118) – without any chance to enter a sustainable becoming. So that « there is already more Junkspace under construction in the twenty-first century than survived from the 20th... » (Koolhaas, 2000: 408).

From this point of view, the anthropocene's era not only fulfilled the earth with a huge quantity of buildings and artificialized ground surfaces; it also constructed a huge time bomb, a delayed crystalized pollution that awaits us in a very short future, in the sense that at the end of its short-life terme, this built junk-mass promises to be very difficult either to repair or to be conserved, both impossible to transform and to recycle to fit their new environments. Also built to deploy the full potential of fossil-fuels, these buildings are quite unable to function without a phenomenal amount of energy to be heated, cooled and ventilated, so that it is difficult to imagine they could resist the different « energy-scarce world » scenarios that emerges today, even from the most serious and official institutions. However, junkspace continues to be built every day, in such a way that the United Nations expects global space cooling to double its energy consumption by 2040 (UN, 2021: 6)...

Architecture – designed or not by architects – also becomes a crucial issue as the world is largely driven by a constant urbanization phenomenon that makes

the global population more and more urban each decade – 33% in 1960, 56% in 2020 (UN Population Division, 2018) –, and since predictions announce that, by 2050, more than 68% of the world population projected to live in urban areas (UN Department of Economic and Social Affairs, 2018). In this context, by 2060, « global material use is expected to more than double » and « the floor area of the global buildings sector projected to double » (UN, 2021: 29); mostly in countries that « do not currently have mandatory building energy codes in place » for now (IEA/OECD, 2017). Without ecological education and rules to constrain the markets, it is likely that more urbanization means above all more impervious soils and therefore more floods, more human constructions and therefore less wild ecosystems, more infrastructures and Large technical systems (LTS) (Hughes, 1983); and therefore less autonomous and resilient micro-grids of transports, energy and food productions. And finally, more slums. Indeed, despite efforts from the international communities in improving slums and preventing their formation, slums continue to grow worldwide, in the sense that the United Nation itself admits that « absolute numbers continue to grow », so that « the slum challenge remains a critical factor for the persistence of poverty in the world ». In 2016, « one in eight people live in slums », representing « around a billion people » living « in slum conditions » (UN, 2016).

Will societies choose to follow the « solutions » of the home automation, smart cities and smart landscape (Koolhaas, 2015) sold by tech companies to answer those issues – leading to centralized, expert and technology-driven « sustainable » megalopolis for the wealthiest? Or will they choose the path of degrowth, of vernacular & low-tech solutions (Watson, 2020) and of « eco-decentralist design » (Todd & Tukul, 1981) initiated by the « Green Cities » movement (Berg et al., 1989)? Whatever solutions may be taken, a fundamental point lays in the fact that each technical option we choose will also have its certain impact on our mammal bodies and psyches, our cultural local imaginaries and cosmologies.

Indeed for now, modern architecture has been driven by the modern paradigm of the private and the control, the « development » and the economic growth, the idea of a linear constant scientific progress and its blurred link with mystified social progresses, all this being embedded in the overall paradigm of the new (Rosenberg, 1960). But many hints tend to prove that the Anthropocene era imposes to shape an architecture that would, on the contrary, help us to slow down, to let things happens without us (what Lurianic Kabbalah called Tzimtzum), to reconnect to a conscience and a knowledge of the societies and milieus that we inhabit, and above all, to reconsider our deep personal and cultural relationship with the biosphere so that it can really become a shared

articulation of more-than-human bioregions (Glotfelty & Quesnel, 2014). In this sense, architecture may even represent a very interesting medium to consciously reshape our ways of life and our mental structures. Far away from staying the perfect tool for extractivism it was, from pursuing the pure anthropocentric views that characterized our modern era, and from reinforcing the structures of social domination with coercive-adapted spatial orders, architecture could rather become the perfect way to follow « The Earth Path », and « ground our spirits in the rhythms of nature » (Starhawk, 2016).

Finally, if the timeless « art of aedification » have something to do with our specific anthropocene era, and if it may become a solution rather than the main problem, it's probably thanks to the fast-extending scope of competences and interests that transforms the architectural discipline into a field that possess ecological opportunity. Or, to say it with designer Bruce Mau: « If you think about architecture as a methodology – independent from the outcome – you would see that architecture has a deep culture of synthesis informed by civic values. If you have this capacity, that's the most valuable capacity of this time in history » (Mau, 2012: 26). Indeed, « architecture » as discipline already changed, and continues to change so much that few researchers already talk about « post-architecture » (Harriss et al., 2021). This because, as we saw it, tackling the ecological issues of our era will not require to design new labelled industrialized green-constructions, but mostly means to act a very deep restructuring of the building sector and professions, the relationship we nourish with domestic and shared space, the hierarchy we establish between experts and vernacular, the dualism we trace between human and non-human. There is no doubt that, expanding its field of interest far from its original « art of aedification » ground, architecture as discipline could be considered the perfect tool to address the issues highlighted by the ecological humanities (Rose & Robin, 2004). In this sense « the expansion of the discipline and the experimentation with alternate forms of architecture practice is not simply a new trend, but a survival tactic » (Harriss et al., 2021: 14): not only for the architects and architectural discipline, but for the whole of humanity !

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