INTRODUCTION

Scarcity: a word that hangs over early twenty-first century society as both threat and reality. Scarcity: a condition that is shaping many of our environmental, economic and political futures. Scarcity: something we take for granted and therefore feel helpless in the face of. But what if scarcity is not inevitable? How then could we deal with it, how then could we design with it?

There have been previous attempts to address scarcity. Forty years ago, the Club of Rome think-tank published *The Limits to Growth*.[1] This report took a series of variables – food, non-renewable resources, population, pollution and so on – and mapped how they interacted over time. The authors predicted that if the global economy continued to grow as it had in the past, the world would reach its limits at a certain point. This conclusion was fiercely contested, but recent studies have shown its predictions to have been impressively accurate. Notwithstanding its pessimistic tone, *The Limits to Growth* attempted to account for many aspects of the modern economy and ecology. It had at its heart the most basic economic concept – scarcity – and for the first time prompted an interpretation of the complex nature of scarcity in relation to other systems.[2]

"Limits to Growth": Donella H. Meadows, *The Limits to Growth: a Report for the Club of Rome's Project on the Predicament of Mankind* (London: Universe Books, 1972)

For a more recent review of the issues see: Ugo Bardi, *The Limits to Growth Revisited* (Heidelberg: Springer, 2011)

Forty years on and the issue of scarcity appears ever more relevant. The contemporary politics of austerity raise scarcity as a spectre, while rising inequalities draw attention to its realities.

Environmental politics invoke the idea of planetary limits as a call to action. Assumptions about perpetual economic growth are being questioned as we confront the diminishing of resources and the degradation of the environment.

Scarcity runs through all these debates; as a basic economic concept and as a practical reality, it touches us all one way or another. For designers, it affects the production of our environment and hence cuts to the core of contemporary practices in design and architecture. It is essential therefore to understand the historical and contemporary constitutions of scarcity in order to know how to work with it. It is equally important to find new readings of scarcity, readings that escape the dominant structures and processes that limit contemporary economic and social life. Scarcity is not going away, so we had better understand how it is created and what it means.

In the most general terms, scarcity is understood as an insufficiency of supply: a lack. This essay takes "lack" as the working definition for scarcity, but challenges its neutral, uncontested status. Scarcity as simple, inevitable lack appears to shut down opportunities for design and life. But what if other readings of scarcity could offer productive opportunities, moving away from a negative and limiting conception? To find these other readings we have to understand that, far from being neutral, scarcity is *designed*. In turn architecture and design have to deal with these constructions of scarcity in order to know better how to design within the context of scarcity. Only then can the full implications and potential of design be explored.

To be so apparently affirmative about a term that has such bleak connotations probably appears counter-intuitive, even foolhardy. But a fresh understanding of scarcity allows one to imagine new possibilities, and with them new social formations.

DESIGN

Working within externally defined constraints is a fundamental part of the design process; scarcity is thus always a context for design. Design here is seen not as a noun, a set of objects, but as a verb, a set of processes that necessarily deal with surrounding systems and contexts, including scarcity. This engagement with the limits thrown up by scarcity can be productive. In the early 20th century one finds fascinating attempts not just to design in the context of financial and material shortages, but more to construct architectural and design *values* out of that very engagement, and so produce a collective language out of our societies' confrontation with scarcity. Thus urbanists worked with the politics of distribution, architects explored collective languages of minimal dwelling and designers explored a new functional objectivity in their designs.

Perhaps the most sophisticated attempt to construct an architectural value out of a sublimated engagement with scarcity is Mies van der Rohe's famous dictum "Less is More". However, it also shows how complicated design's engagement with scarcity could become in a capitalist society. Mies's catchphrase for engaging design in a relationship of means and ends found itself turned into an economic imperative. It is a self-imposed aesthetic programme expanded into a general principle, employing the architect and designer as a servant of modern capitalism. The credo of reduction merged with the logic of efficiency: make more with less.[3] Creativity has always been absorbed by capital: the creative professional was never *outside* accumulation, but an essential part of it. He and she were capital's strongest workers, adapting to ever-new constraints, expanding the logics of the creation of value to ever-new margins: the creative designer became the epitome of the entrepreneurial self.[4]

See for example: Pier Vittorio Aureli, Less Is Enough (Moscow: Strelka Press, 2013). As Aureli notes, Mies used the phrase "less is more" for the first time in an interview in the *New York Herald Tribune* in June 1959

See Ulrich Bröckling, *Das Unternehmerische Selbst: Soziologie einer Subjektivierungsform* (Frankfurt am Main: Suhrkamp, 2007)

Mies's dictum has been revived, dressed in a new coat. Following the excesses of the early 2000s, design, and in particular architecture, has become the agent of contemporary austerity, wrapping the exigencies of pared budgets in a thin veneer of reduced aesthetics, and meanwhile letting the market determine spatial conditions. Once again, design has shown what it is capable of: making more out of less, so creating surplus value. It might be easy therefore to just reject "less is more". But our argument is that it is necessary to fully engage with it, to consider design as a practice of means and ends, aware of its relation to the wider contexts of production. While it would not be appropriate or sufficient today just to return to the architectural and design experiments of the last century, there are real lessons to be learned from the modernist attempt to construct design values and cultural meaning out of our relationship to scarcity.

Beyond the complex dimensions of aesthetic experience, design is often considered to be a process of solving problems in the most efficient manner. Design in this guise can easily be reduced to a measurable practice: for example, designing to reduce a building's carbon emissions. Design, particularly when linked to technology, holds out the promise that the effects of scarcity can be perpetually held at bay on the back of innovative and ever-more efficient systems. The solving of problems and the pursuit of efficiency are often used to legitimate the designer's role in society beyond simply the production of an experience. Designers present themselves as part

of an overall societal effort to overcome scarcity, or at least to mitigate it through the optimal use of resources.

However, this problem-solving paradigm of design can leave the underlying conditions unconsidered, leading to the paradox that design, far from "solving" the problem of scarcity, may actually exacerbate it. This happens in a number of ways. The first, and most obvious, is the way that obsolescence is actually designed into objects, from buildings to consumer products. At a large design scale, commercially developed housing too often precludes future adaptation, shutting down the opportunity for change, thereby making people move rather than adapt, and so keeping the market in a state of permanent demand.[5] At a smaller scale, today's mobile phone has an average life span of 18 months, with software updates causing slowdowns in older devices. Domestic appliances use proprietary parts that cannot be replaced, and frequently the cost of repairs makes buying new goods more attractive than fixing old ones. See Tatjana Schneider and Jeremy Till, *Flexible Housing* (Oxford: Architectural Press, 2007): Chapter 3

Without this intentional obsolescence, products would last longer, demand would be reduced and the market stifled. Designed obsolescence is a symptom of the market's need to constantly produce more scarcities as an engine for more consumption. Contemporary industrial production arose out of conditions of scarcity, and cannot exist outside of them. It projects an image of an abundant society, which can afford to create endless consumables. However, this apparently abundant production of stuff masks the underlying production of scarcity. Scarcities are thus designed into the system of consumption: they haven't arisen by chance; they are the inevitable and predictable consequence of decisions and actions. In our current social and economic models scarcity must be maintained so

that production can be maintained.

Design can also produce scarcity in the way that it changes its own context; the solving of one problem may lead to multiple others. Responding to specific scarcities by design and innovation therefore often causes new scarcities to arise. To give but one example, the invention of the kidney dialysis machine saved lives, but also created an immediate scarcity in dialysis machines. Under scarce conditions, the young physicist Willem Johann Kolff built the first prototype of an artificial kidney for dialysis from sausage casings, wooden drums and juice cans in 1938 at the University of Groningen. By 1945, his dialyser had its first success in saving the life of a patient suffering from kidney failure, which before would have caused death. Once the invention was refined and implemented in the post-war period, demand for it exceeded supply, and still does.[6] The overcoming of one problem through design led to the emergence of a new form of demand, and a new form of scarcity. The same is the case in what are termed disruptive technologies, inventions such as mobile phones that transform the field into which they arrive, creating at the same time a context for new scarcities.

The kidney machine is one of the classic illustrations of the problem o scarcity in medical ethics: see e.g.: M. J. Langford, "Who Should Get the Kidney Machine?," *Journal of Medical Ethics* 18, no. 1 (March 1, 1992): 12–17.

Finally, design also contributes to the production of scarcity in the way that it is part of the desire-making machinery on which markets depend. Design increases the fetish nature of commodity and with it the associated desire. The stimulation of desire and the production of want through design thus becomes a key driver of the market, as consumers are led to follow their desires. One almost certainly does not need a new smartphone every year, but their ever-

evolving aesthetic and technical design lead us to believe we do, while their proprietary software upgrades create real functional scarcities. The result is an increase in resource scarcity as rare materials, often extracted at huge social and ecological cost, are depleted to maintain the production of the new.

The problems that design frequently solves are primarily those set for the benefit of corporations and investors, rather than the user. The fresh surfaces and endless creation of newness presented by design obscure the social relations that constitute things. The Dutch critic Roemer van Toorn uses the term "Fresh Conservatism" to describe designers who are constantly creating images of freshness in a way that disguises the highly conservative nature of the constitutive processes and values.[7]

Roemer van Toorn, "Fresh Conservatism, Landscapes of Normality," *Quaderns* no. 215 (1997)

The design of the new thus frequently generates scarcities without any social or ecological oversight. This is particularly the case with the built environment, where design is operated on the grandest scale. Prior to the financial crash of 2008, architects were caught up in, and complicit with, the general frenzy of growth and production. Empowered by new computer tools, they presented ever-fresher and shinier images of their clients' buildings, which in the presentation of a world of abundance allowed us to forget the scarcity-producing nature of these developments. As velvet gloves for the iron fist of the real estate market, buildings became desire-creating commodities at an extreme scale.

One problem is that the instruments of design do not allow us to engage with the underlying social and political conditions within which design is conducted. Design is practised through a series of technologies, primarily drawing and its derivatives, which have

formed an elite, expert discourse. Drawings tend to foreground questions of appearance, and in doing so mask specific social, political and ecological questions. The designer becomes obsessed with form and technique, as these are the areas of production and technology that the designer has most control over. Ultimately, these technologies of design silence the user, freeze the object and depoliticise design as such.

Design must understand its Janus-faced character, caught between addressing need and producing desire. Acknowledging this ambiguity reinforces the demand for the politicisation of design, embedding it in the social discourses from which it cannot flee. As we shall see, scarcity asks us to re-evaluate what "need" and "desire" might actually mean, and so provides new contexts for design to operate in. The expansion of design beyond problem solving displaces the discipline from the field of the provable and quantifiable – of science, technology and engineering – into the realm of the qualitative – of value and the aesthetic. This is still within the realm of desire production, but also of the political, the contestable. In this development, design shifts from matters of fact to matters of concern, as the sociologist and historian of science Bruno Latour puts it.[8] Matters of fact appear hard, measurable and certain, whereas matters of concern are socially contingent and negotiable.

Bruno Latour, "Why Has Critique Run Out of Steam? From Matters of Fact to Matters of Concern," *Critical Inquiry* 30, no. 2 (2004): 225–248

Design in this mode of concern shifts its attention from shaping objects alone to an engagement with the life of objects – to their constitution, their consequences and their relationship with the human and non-human worlds. With scarcity enmeshed in these relationships, a better understanding of how design works under

conditions of scarcity is needed. We cannot simply demand that design should somehow solve scarcity, or overcome scarcity. Design should start by accepting scarcity as a condition and constraint, consider how its work relates to scarcity, and find ways of constructing new collective values out of scarcity. This is not easy, as design frequently obscures its own conditions of production, and the social and economic forces that determine its space of operation. We therefore need to shed light on these underlying forces, and like our 20th-century forebears, understand more about the economic constructions of our conceptions of scarcity.

ECONOMICS

The notion that something in the world might be restricted in quantity is easy enough to grasp, and the roots of our everyday use of the word "scarce", as well as a host of related concepts (shortage, dearth, lack), can be traced back millennia. Importantly, scarcity has been bound to economy as part of society's means of regulating and managing resources. Contemporary capitalism uses scarcity as a central feature of its raison d'être. In a seminal note on the objective of economics, the British economist Lionel Robbins describes the discipline as "concerned with that aspect of behaviour which arises from the scarcity of means to achieve given ends. It follows that Economics is entirely neutral between ends."[9] Scarcity here becomes an essential precondition for any and all economic behaviour. For Robbins, economics is the "science" of choice under conditions of scarcity, and its purported neutrality removes any political or ideological stains. In this light, the assumption that we live in an age of scarcity needs to be challenged. In fact we live in an age of scarcity as defined by capitalist economics.

Lionel Robbins, *An Essay on the Nature and Significance of Economic Science* (London: Macmillan, 1932)

It is through an unravelling of these economic structures that one might reach new understandings of scarcity, shifting our conception of it from one that is simply defined by lack, in terms of neutral quantity, to an unravelling of the way that lack is created.

The use and meaning of scarcity in relation to economics has changed over time. In feudal society, the management of scarcity frequently took the form of a series of mutual obligations and prohibitions regarding the distribution of food between the aristocracy and peasantry. In later mercantile society, a particular set of systems

was developed to deal with the threat of scarcity. Grain production and supply were regulated by the state through price controls, prohibition of hoarding, constraints on export and limits to the amount of land to be cultivated. These measures were designed to both limit excessive abundance, and with it the collapse of prices, and also prevent scarcity in order to protect the wealth of a nation and to suppress revolt and political unrest that might arise out of a lack of food. However, for all their regulatory sophistication, these mercantile measures could not outwit scourges such as crop failure and drought. This ever-present spectre of an impending, unswayable, scarcity was used to legitimate attempts to overcome scarcity, something that persists today as threats of future shortages – say of food – are invoked to sanction market operations – for instance land-grabs in Africa.

The mercantile anti-scarcity system, with its regulations and inherent failures, later came under pressure from the laissez-faire model, in which the free market is left to control supply.[10] This is a system, self-regulated by an "invisible hand", that claims to level out any sort of scarcity much better than any adjusting state power could do, and which releases scarcity from market prohibition. Soon, however, rising new scarcities derived from growing social differences and inequalities made it necessary for the state to intervene again, forming the model of the welfare state, which rebalances the market's unevenly distributed scarcities.

For an overview of this shift see Foucault. Michel Foucault, *Security, Territory, Population: Lectures at the College de France 1977--1978*, ed. Graham Burchell, François Ewald, and Michel Senellart, vol. 4 (Macmillan, 2009)

The threat of scarcity to the entire population that existed under the mercantile system is replaced by the structural necessity for an

anonymous some-of-the-population to endure scarcity, sometimes. One can see exactly this is in the way that contemporary localised scarcity, for instance in the form of hunger or deprivation, is permitted to develop in order to prevent scarcity operating at the level of the whole population. The global economy evolves unevenly, developing an uneven geography of scarcity that affects the lives of different sections of society in unequal ways. Cultural and political ideologies explain away these structural pockets of scarcity as being the fault of their inhabitants, attributing poverty and unemployment to fecklessness and antisocial attitudes, rather than as the inevitable product of an undemocratically managed system of production, distribution and exchange.

The laissez-faire assertion that an ideally free market will safely regulate itself is still the preset of today's dominant neoliberal capitalism. However, something changed significantly in the early 1970s, accelerating the free-wheeling dynamic of global economy in an unprecedented way. By unleashing the dollar from the value of gold – an act that led to the end of the Bretton Woods system of global exchange controls – and from material production in general, scarcity became truly phantasmic, abstracted from material reality and now more firmly than ever is associated with immaterial speculation. Since the 19th century, capitalism has been plagued by crises of overproduction, by falling rates of profit and by the fact that it becomes ever more difficult to extract surplus from production. Recent acts of financialisation are simply the latest means for capital to invest in something, anything, even if it is a house of cards built on Ponzi principles: an unsustainable pyramid where one person's return is dependent on the debt of others. Contemporary financialisation thus creates speculative asset bubbles and virtual scarcities, as manifested in futures markets in food prices and real estate

speculation.

Within neoclassical economics, scarcity arises with the perceived endlessness of human desire, which can never be satisfied. The paradox of scarcity within economic thinking is that it both fuels the market (by regulation of resources and the production of demand) and also presents a threat to the unfettered market (by suggesting that the growth upon which capitalism is dependent has limits). Economics thus oscillates between the regulation of supply and the ongoing attempt to overcome the limits to growth. The former, regulatory, model has led to uneven distribution and with it inequalities. The latter, growth, has created new scarcities: increasing social inequality and unsustainable material and biological extraction.

All of the episodes in the economic history of scarcity challenge the neutral sense of the term as presented in neoclassical economics. The allocation and distribution of resources does not happen in an even-handed or logical manner: supplies are manipulated and controlled by vested interests. Far from being natural or inevitable, scarcity is *designed*. Food, for example, is not scarce in terms of quantity. There is enough food in the world to feed everyone, but food distribution systems, the politics of food subsidies, the machinations of global food corporations, international land grabs and more combine to construct scarcities of food in particular places. The food is too often in the wrong places, and owned and managed by the wrong people. The meaning of food scarcity is very real – high food prices, hunger and malnutrition – but the underlying condition is constructed. However, the presentation of scarcity, of food or anything else, as naturalised and inevitable masks these constructions, creating a false consciousness that disguises the underlying conditions and the dynamics of inequality.

This sense of constructed scarcity based on neo-liberal economic

imperatives reaches into all spheres of human operation, including the production of the built environment. To some extent there is nothing new about this. The renaissance architect Alberti advises that a "private building must be so treated that it will not seem possible to remove anything, because everything has been put together with great dignity."[11] Alberti valorises an underlying conception of the sensible use of scarce materials, framing the aesthetics of architecture within economic terms of reference. But in the contemporary condition, the impact of economic-scarcity thinking on building is perverted from diligent stewardship as a means into a dominant end on its own. The Italian political theorist Mario Tronti talked about the "Social Factory", an indication of the way that the post-Fordist production paradigm has spilled out from the factory to infuse all aspects of social production, including our cities and selves.[12] Architecture shifts from being the sensible deployment of scarce resources, in the Albertian model, to being a pure instrument of surplus production without any other qualities and values.

Leon Battista Alberti, *On the Art of Building in Ten Books*, ed. Joseph Rykwert, Neil. Leach, and Robert. Tavernor (Cambridge, Mass.: MIT Press, 1986). Book 9.

Mario Tronti, *Operai e capitale* (Torino: Einaudi, 1966)

An example of the dominance of economic-scarcity thinking within the production of the built environment is the UK's notorious Housing Renewal "Pathfinder" scheme, introduced by the Labour government in the 2000s. This initiative made the market value of housing the central instrument of urban regeneration. The argument was that rising house values would in turn lead to inward investment. The means to encourage the housing market were extraordinarily brutal. The swathes of half-empty, low-grade, tired old houses that were a feature of the northern cities were seen to be devaluing

regional house prices. They therefore had to be demolished, and people relocated, in order to stimulate the market. Most of the replacement new housing was beyond the reach of the displaced families, priced as it was to create a more desirable market for gentrifying occupants. These acts of demolition – repeated in recent years in Detroit, where federal regeneration grants are spent on area clearance – were a direct way of constructing scarcity in order to manipulate the housing market, and if it resulted in (using the British critic Owen Hatherley's words) "slum clearance without socialism", then so be it.[13] Exactly the same logic is applied in the clearance of slum dwellers from cities in India and elsewhere in the global south, all done in the name of urban renewal based on the tenets of progress and growth.

Owen Hatherley, "Pathfinder Was Slum Clearances Without the Socialism," *The Guardian*, November 19, 2010.

Spatial development is too often determined by scarcity thinking – a surplus is eliminated to increase the value of a commodity. As part of this process of the economisation of the built environment, the whole way that we talk about architecture has shifted, being redefined through value engineering. The passive act of observing and measuring quantities is replaced by the active aggression of value engineering, substituting cheaper materials and working to drive down overheads. Of course that value is the value defined by the market, thereby eliminating other value systems – of well-being, of longevity, of appropriateness, of ecological fitness or of use. As long as scarcity is dominated by the logic of neoliberal economics and the market's attachment to exchange value, it remains impossible to relate it to these other forms of value. The argument that the logic of economics, founded on scarcity, can be extended into any area of human activity is found wanting, because it is clear that there are

social fields that are beyond that logic.

Our call therefore is to extend our conception of scarcity beyond the limits of economic knowledge. One way forward may be found in the origins of the word economy in the Greek term, *oikos*, a household, an etymology that it shares with ecology. Both economy and ecology are thus founded in the vernacular knowledge of running a household – managing resources not in a linear model of extraction, but in a cyclical system of relations to seasons, storage, distribution and redistribution. The vernacular understanding of economy as an everyday field of human activity has become hopelessly entangled with economics as the expert, scientific, study of that field of activity. The exploration of the world by the economist's gaze does not equate with the handling of the *polis* and its ecologies by the means of economy. Scarcity, universalised and naturalised in the field of economics, takes on a very different guise within *oikos* – as economy and as ecology. A collective re-imagining of scarcity must necessarily entail a transformative re-imagining of economics (as economy) and ecology. We return to this in the second half of the essay, but first need to see the specific ways in which the manipulation of scarcity leads to inequality.

INEQUALITY

From 1750 onwards, the British Parliament enacted a series of measures that brought about the *enclosure* of land.[14] The pastures, acres, forests, rivers and meadows, which had been held, harvested and farmed according to ancient systems of common law, and which provided a livelihood for many common people, were literally enclosed, fenced and walled off. Forests that had provided wood and food for generations were now out of bounds. Fields for which peasants had farming rights fell under the ownership and management of large estates, and with this land shifted its meaning from "use" to a traded commodity. The first modern agricultural revolution sprang from this now-enclosed land, guaranteed by laws that prioritised new property ownership rights. The land could be exploited much more thoroughly, making use of the new, scientific farming techniques being developed at the time. This new food production system did indeed dramatically increase yields and broke one ancient cycle of scarcity, that of periodic food shortages. But at the same time, a total scarcity was enforced upon the peasantry by the acts of enclosure. Deprived of its common rights, this class was forced to migrate to the growing cities in search of food and work, and form the basis of the urban proletariat at the dawn of industrialisation.

See for example: Simon Fairlie, "A Short History of Enclosure in Britain", *The Land*, no.7 (2009) available online at: http://www.thelandmagazine.org.uk/articles/short-history-enclosure-britain. See also: E.P. Thompson, *The Making of the English Working Class*, Penguin 1992

The underpinning rationale for the enclosure acts was that of "improvement": the industrialisation of farming techniques to increase efficiency and yield in order to feed an increasingly large