CHAPTER 3

PUBLIC SPACE
AGAINST
HIPERCONNECTED CITIZEN

THE

INTERMITTENT

CITY

CHAPTER 3.
THE INTERMITTENT CITY

In the last decades a series of social and technological innovations have transformed our communicative habits. Advances such as the generalization of the internet, the intensive use of smartphones and the increase in mobile have raised a scenario unheard of until now: without leaving our home we can communicate instantly with anyone in the world that is connected. It is about the network society, a social structure in which real-time information and the experience we have of it are some
of its main formative elements. In this informational context emerges a new urban profile: the Hyperconnected Citizen. An individual of the twenty-first century who questions the established role of the public space through his socio-technological peculiarities: if traditionally it represented the space of relationship par excellence,

it is urgent to reconsider its role under the light of the networks that have taken the lead. What should the public space of the 21st century be like? In what sense can it be re-formulated through the new information technologies? And above all, what can the public space offer to a hyperconnected citizen who is able to relate to the world without going out to the street?
Given this scenario, several lines of research are intended to shed some light on the subject. Some sectors advocate for a real-time and much more democratic management of the public space through the concept of democracy 2.0.

Several groups use a more playful approach to the debate, and augmented reality technologies pose the public space as a great board of social, economic and participatory game. In other cases, there are some options regarding productive public space to consider, capable of generating energy and food as a social catalyst.

Indeed, there are many various alternatives that our social and technological landscape offers to us, and although some of them are still somewhat uncertain and volatile at the same time, there is something that seems to be certain: the establishment of the information age has the potential to profoundly transform our use and conception of public space, the true structure and meaning of a city since its foundation. The role of the public space and the twentieth century.

The existence of the public space is as old as the first sedentary communities of the Neolithic Revolution. The ability of these societies to produce surplus was a fundamental issue because, because of the necessity to carry out constant exchanges of goods, the roads and the remaining spaces between the buildings were used intensively and were destined to the new functions of circulation, commerce, leisure and socialization.The Agora and the Ancient Greece theatres together with the forums and the great infrastructures of the Roman Empire were clear examples of the necessity of the classic societies to understand the public spaces like "scenarios of expression". In this way, the understanding of the public space was generalized as a place to express shared ideals regarding how each individual develops his condition as a person and claims his bonds with a particular collective.

The Middle Ages deepened this symbolic conception of a public space, but it did so from the extremely theological coordinates: great buildings of sacred character were constructed that delimited the public spaces of the fortified city.

These offered to the citizens, beyond the development of the usual social and commercial activities, the possibility to gather ahead of the religious power to recognize and to honor it. Yet during the Middle Ages the public space had also another fundamental function: to act as a punitive scenario.

Indeed, the punishment was a public celebration that besides being a demonstration of power was constituted as a ludic and repressive event.

At the end of the nineteenth century, the Industrial Revolution raised the public spaces from a new perspective, in opposition to the terrible working conditions that existed in the industries and the unhealthiness of the agglomerated working neighbourhoods. Deeply linked to the public space, the notion of a green space, large parks and gardens, was constituted as an ideal instrument for the promotion of health and urban well-being. Throughout the twentieth century and with the development of financial capitalism and the consumer boom of the postwar period, the public space has undergone transformations that have characterized it in a very different way to that of other times. The interests of the private capital in a global socio-economic context and the willingness to convert them into "consumption scenarios" have reduced its former public and political dimension. This phenomenon has been dramatically accentuated by the landing of mass tourism in the last third of the twentieth century, which in many cases has literally converted the public space into the authentic consumer product.

The arrival of the informational society
As well as urban alternatives proposed in time to relieve the negative effects of the Industrial Revolution, new interactive habits were proposed by the Information Revolution to suggest other readings and uses of the public space. In this sense, the arrival and generalization of the Internet at the turn of the century has been fundamental: a technology that is a result of the multidisciplinary encounter born in the military field and without economic motivation at the beginning, that was open almost from its birth and developed by its own users.

It is important to keep in mind that not just their original designers produce through constitutive historical processes, and technologies. Thus, the Internet has been developed in the during a social process orchestrated by a series of ideas, values and interests that have crystallized in a computer network that basically allows users to exchange information in real time. Understood as a communication of knowledge, the information has been crucial not only now but also throughout all the history. It is evident that both in the agrarian and in the industrial era, the development of the modes of production necessary to accumulate agricultural or industrial products has been carried
out through constant exchanges of information. However, the informational particularity of the present days implies that nowadays the information is a tool that is used not only to accumulate product, but also to produce and accumulate more information. It is comprised as a good itself, and not as a simple instrument to achieve objectives of different nature. In this sense, the concept of informationalism represents a technological paradigm, which itself has nothing to do with any kind of social organization. However, it does offer a platform for developing a new social structure: the "network society".

In fact, the social networks perceived as social organizations have always existed among human collectives. Ultimately, these are social structures constituted by the information networks. However, the social networks of the 21st century have the peculiarity of being propelled by the new information technologies, something that is fundamental for two reasons. In the first place, they emphasize their inherent flexibility in time and space: the generalization of smartphones and the increasingly usual presence of wearables promote
the development of instant, global, and personalized information networks. Secondly, the new information technologies allow solving the coordinating needs of the network systems, a fact that traditionally was seen as its main drawback in relation to the hierarchical systems.This new type of social organization based on the concept of network as structure and the information as raw material has led to the reformulation of certain social dynamics.

Issues such as digital activism that led to the change of the constitution in Iceland, the revolutions of the Arab Spring, concentrations of 15M and even Daesh terrorism are events that could not be explained without constant competition of the Information Technologies.

The hyper-connected citizen and his new intersubjectivity

In this context, the cities of the 21st century have witnessed the emergence of a new urban actor: the hyperconnected citizen. It differentiates itself from the traditional citizen by being able to establish and maintain a fluid, constant, global, personalized, instant and, most importantly, geo-localized connection with other people, objects and institutions. However, the scope of their capabilities is not limited to receiving, processing and transmitting the information of all kinds, but also to experiencing it through the multiple augmented reality resources that are available to them.

The combination of this technological aggregate with the new social, cultural and ecological dynamics of globalization leads to the emergence of an urban profile that stands out by offering a new intersubjective scheme. In this
sense, a post-human subject is created, that appears as a nomadic assembly situated in a shared space that neither belongs to it nor completely controls it: it simply occupies it, and always does it in community. However,, the community crystallizes in a series of collectives that are not only formed by "other" humans, but are also constituted by "other" factors, rather ecological, technological, computer, etc.

This set of agents of diverse nature are developed in a material, integrated, relational and cosmopolitan reality that has little to do with the tabula rasa, that characterized the industrial subject of the twentieth century. The hyperconnected citizen is therefore immersed in a network of viral connections with agents of various species. It is determined by and from a multiplicity, regarding which it does not hold a privileged position, yet operates from the same ontological level.

That means that it can no longer be aligned with the Promethean narrative of the modern movement, but must assume a plural and shared reality where it must wield abilities closer to those of a multidisciplinary mediator than to those of a modern hero.

In this context, the hyperconnected citizen appears as an agent that no longer has to go to the public space to be able to place himself in what we previously described as a "scenario of expression", something that was traditionally fundamental to build and keep an identity of being a part of the polis, which, as Foucault explained, inscribed the wounds on the marks and physical footprints of that common space.

On the contrary, the hyperconnected citizen can find his expression scenarios from his own domesticity, where through the latest technologies he can do much of everything that before could only be done in the public space: Manifest himself collectively, interact socially, exchange merchandise, share activities, etc.

Given this situation, the public space is at the expectant position of changes.

On the one hand, the obsolescence of the traditional citizen use fosters a part of its decadence, increases the rates of violence and crime and reduces its symbolic and representative value. On the other hand, the abandonment of the public and identity function of these type of spaces increases the tendency for its privatization and conversion into consumer product, especially appealing to the tourist market. The public space becomes a privilege of the wealthiest fractions of the consumer market, something that in the medium term implies segregation, isolation and inaccessibility for the most disadvantaged communities.

The reformulation of the public space

Hence it seems urgent to rethink the role of the public space considering the latest technological and social transformations. As applicable to the most of major changes, the same element that leaves an established practice obsolete becomes the actor of the next one, it simultaneously acts as a limit and as a condition of possibility.

The case we see is not an exception. On the one hand, new information technologies and new social habits represent a limit to the understanding and the use of public space as it is nowadays established, but on the other hand they represent a great axis capable of articulating new proposals. Some of them opt for a process of optimization and democratization of the use of public space, taking advantage of the real-time data management and the possibilities of the latest smartphone "apps".

It is a set of proposals that rely on the administration of the public space as the main tool to adapt its use to the fluidity and flexibility of the social schemas of the 21st century. Another line of development is to take advantage of the latest augmented reality developments for mobile phones with the intention of turning public space

into a great game board, as a great e_s_c_a_p_e_ _r_o_o_m_. Without being groundbreaking, traditionally the public space has been also the setting of games and sports of all kinds, however, through applications such as those of Pokémon Go any corner of the city is susceptible of becoming a ludic stage in which the idea of the route and the interaction is fundamental. Millions of people around the world have traveled thousands of miles on foot, by bicycle, by car or by public transport to fulfill some of the requirements of the game.

This type of practice provides certain benefits both physical and mental, while encouraging interaction with other users. However, whether the social relations created in this context are fruitful and persistent is questionable or if they dissolve into an ephemeral and banal superficiality. In any case, the augmented reality apps superimpose a virtual layer above the usual physical structure of the public space that does not have to necessarily respond to the interests of the established authority, as traditionally has been happening in the most representative and monumental spaces.In this sense, these types of exercises constitute a powerful subversive tool that in the future can respond to other urban needs beyond the merely playful ones.

We therefore face a wide and diverse prospect of innovative proposals, however it must be kept in mind that none of them have had yet been firmly established or has had an impact of any depth andpersistence, though they did establish the clear differences and autonomy of a parallel use of representativeness of the public space in the network, able to substitute it and exercise activities of the physical world.

Probably the main challenge for this to happen is no longer a technological or a social type. Still it has become a specifically urban challenge: how to get beyond the established urban habit to adopt other dynamics that would be more aligned with the possibilities and needs of the 21st century. Actually, our understanding and use of the public space follows patterns that are deeply rooted in the habits of the twentieth century, generating an urban environment that appears to us as a second nature that is difficult to replace. At the same time, the speed of changes and its global characteristic allows us to reflect on how we should design the public space of our cities, former spaces of representation and exchange, in an era where these two functions already exist on the Internet?

The intermittent City.
We believe that one of the victims of this global crisis of the Covid-19 pandemic is specifically the city, as a public space to share, to communicate and to expand our life experience in every way; and these days we are suffering a reduction until almost disappearance of all this public space replacing the square by the shared screen, the face-to-face talk by the shared audio, or our 360° vision by the fixed point of the camera.
But, what will happen to our cities?
In the history of Architecture, there have been different visions of this same problem, from the bunker cities faced with the threat of a nuclear war, to biosphere cities as the iconic image of Buckmister Fuller's dome over New York to protect us from environmental threats. Or on another scale, from the suggestive images for science fiction movies created by Syd Mead*, to the developments of design and prototypes to create a community on Mars.

The Bomber Jacket.

One of the most critical aspects of the global impact of this Pandemia, like the one we are experiencing, has as its stage our most successful invention as a society, our cities.
In recent days, we have collectively exercised a drastic compression of our space-time, in a zoom-in, zoom-out - zoom.us could be the most descriptive and paradigmatic reference of these times-, connected from our room to multiple rooms in the world, from our screen to multiple screens, microphones and cameras with which we are sharing globally the grade of intimacy never seen before, but above all, when the effervescent effect of hyper-communication is over, we will have transferred to this virtuality at least three phenomena that distinguished real from virtual spaces: the permanent, the simultaneous and the collective.

Three concepts that have undoubtedly defined our urban experience from generation to generation, and that an unexpected accidental castling has made them reversible as a Bomber jacket - whose original orange lining was specially designed in the aviation industry so that pilots could put it on in case of an accident in order to be rescued.
We still live in the shock of an accident, and in that dramatic space of the moment after something that we begin to understand, and the moment before knowing what has happened to us. A major accident, global and with multiple consequences on our personal and collective habits and customs, but which, like the reversible lining of a Bomber jacket, forces us to re-adapt to a new normality, to assume collapse and try to survive.
If we have transferred to virtuality the idea of the permanent - spatially and temporarily - of the simultaneous - all at the same time - and of the collective - all together -
What will our city become?
The accident always places us in a point of suspension, between something and something, into the concept of ***the inter.***

We are witnessing, with confusion and fascination, the desolated images of any great avenue of the planet normally collapsed, we also see the irremediable regeneration action of nature that always reminds us that the planet will not come to the end, but only our presence in it, and we are getting used to unforeseen phenomena, such as the luxurious necessity of a balcony, or the surprising importance of the facade in front and its neighbors, with whom we live, see and share applauses every day, more than with any other people in our staircase or building. New friends.

But the city, as a collective idea of organizing the flow and time of social activities in public space, has been suspended, has been left in suspension.

There couldn't be a better definition, since we imagined a greater reliability of the entire system on which we placed the trust to use it. It is paradigmatic that many of the values with which we build coherent arguments of urban management have disappeared at once. We are in the inter, after an accident, but we do not know how to manage the city in a right way in these circumstances.

It could be said that, independently of the collapse of the health system, -impossible to foresee in these magnitudes-, in strictly urban terms, we should not have been so unprepared, after all the over-acting during many years of the intelligence applied, smart cities, and the shift of the old ratios in stock, - typical of the industrial era with which we planned the metropolis, to the management of dynamic data, with the real time data come every three seconds with which we have re-learned how to forget more than remember them.

What a mistake! We are not able to manage a simple mathematical formula for rational use by age ranges and temporal spaces, by neighborhoods, by density, or by the many parameters for which we have invested time and money to determine. We also don't see the Jeff Bezos' drones fly that made Amazon an empire, while we have airports shut down, and the ease of being able to organize reliable, clean, and effective deliveries should be part of the acceleration logic in a change of epoch within these circumstances.

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The city, if it has an opportunity to be used, is to change radically now in order not to have to change absolutely later. Today's city, of inter, of suspense, is of the orange side jacket.
Intermittent, Successive, Personal.
We have enough intelligence to manage it that way, restoring collective confidence in a system to survive in the interim, in the temporality of shock. The debate on the degrees of individual freedom that we are capable of sacrificing or in the opposite direction, the concentration of many personal details in a few hands, completely acceptable and necessarily active, should not become an excuse, since we have delegated absolute responsibility and Awareness in many of our "I accept" on the web infinity of personal data. Confidence will come if there is a plan, if there are leaders willing to guarantee it, and there is efficiency in its execution.
At the end of the day, belonging to a city is being able to use it, in the most convenient way at all times for its own citizens. And perhaps there will be some good news: perhaps the most favored are the neighborhoods that have the most green and open areas near their homes, traditionally on the outskirts and less favored in many other things.

This is the city of the orange side.

CHAPTER 4

PRODUCTIVE CITY
AGAINST
FROM PITO TO DIDO

PARADOXES OF THE SINGLE-PIECE INDUSTRY

CHAPTER 4.
PARADOXES OF THE SINGLE-PIECE INDUSTRY

Throughout the twentieth century cities have under- gone a fundamental transformation: in front of the displacement of the industrial fabric of the suburbs to the generic supply of the industrial polygons of the periphery, the urban centres have stopped being pro- ductive poles to become consumption nuclei.

Indeed, the great majority of industrial clusters that were stimulating capital cities like London, Paris or Barcelona, have disappeared from their urban centres, leaving them orphaned by the productive capacity that once characterised them. On the contrary, these cities have exponentially grown till, in the beginning of the 21st century, turning into large urban assem- blies in need of energy, goods and services. Cities which are incapable of producing nothing but waste after their own consumption, dragging all problems derived from the territorial zoning, such as socialsegregation, logistical difficulties and environmental shortcomings, which are just some of the problems derived from the productive paradigm inherited from the 20th century.

We stand however on the threshold of giving a new role to the cities as centres of productive processes, especially in the light of the technological and social advances of the 21st century. If in recent decades industrial production has been a hidden, remote and unknown activity to which consumption was opposed as its public, bright and happy counterweight, today the re-industrialisation of cities seems to make pro- duction one of the main urban players again.

However, in what sense can we speak of an urban paradigm shift? How can the technological and social advances of the 21st century affect the processes of urban re-industrialisation? How does our present understand- ing of the industry have to change to allow this to happen? And, above all, what kind of cities emerge from the processes of urban re-industrialisation of the 21st century?

Technologies, productive systems and urban planning.

About 200 years ago, the first industrial revolution sowed the seeds of what would later be the main characteristics of the productive systems of the twentieth century: mechanisation, generalisation and mass production. In fact, such inventions as the steam engine in 1774, the automatic loom in 1801 and the railroad in 1768, already pointed these characteristics. Accompanied throughout the nineteenth century by the great Spencerian anthropocentrism and especially by the deep Comtian positivism, these technological contributions had already crystallised at the beginning of the twentieth century in a new production system that revolutionised the in- dustry: Taylorism.

It based its development on the "scientific management of work", a proto- col that reduced costs based on a strict division of labor, and the one that was later perfected by the Fordism, which was able to equip its workers with the necessary consumption capacity to be able to increase the market. The concept of the production chain was thus popularised, a fundamental element to understand the productive system exemplary to the twentieth century and that would have important implications for the western urbanism.

Indeed, following the Industrial Revolution and throughout the nineteenth century the city underwent a major transformation that intensified the processes of urbanisation. In 1800, only 7% of the world's cities had more than 5,000 inhabitants, while in 1900 that number increased to 25% in the face of progress motivation that the new industrial cities offered.

In general, the expansions of the cities took place in a chaotic way, often uniting several urban centres and welcoming urban masses that voluntarily had renounced their rural identity to become consumers of strongly urban ideas, values and goods. This extremely fast urban growth led to the sewerage problems, energy, food and communications, the anomalies the urban con- sequences of which were the widenings and big avenues that spilled most of the major cities of Europe towards the end of the nineteenth century.

These operations offered a clear industrial reading of the cities, in which the mechanisation of their roads, the overcrowding of public spaces and the mass repetition of their blocks led to exemplary ordinations such as the Ensanche de Barcelona by Ildefons Cerdá in 1859, or the Transformations of Paris during the Second Empire, such as the Haussmann Plan of 1852. These types of operations aimed to get away from the labyrinthine grain configurations often characteristic of the medieval city and its handcrafted production based on the idea of a guild, something that tried to be re-for- mulated without success in the city-garden projects, in order to offer large, open and orderly spaces capable of hosting extremely industrial citizens with their demography, lifestyle and mode of production, also linked to a new means of transport: the railway.

However, throughout the 20th century, most European cities experienced

a series of gentrification processes that changed their role in production processes. The gentrification of the enlargements, combined with the de- velopment of a service economy and the emergence of financial capitalism, pushed the industrial fabric towards the peripheries of the European cities, and in a final stage of this dislocation even towards other, much more dis- tant territories as China or India, the regions where production was sub- stantially cheaper for the reasons that everyone knows.

This transformation of the late twentieth century has led to the emergence of the extremely populated cities, consuming large quantities of resources and producing large quantities of waste, a combination that is part of the PITO scheme:

Product In, Trash Out.

Urban consumption

This situation has led to a series of anomalies linked to the urban industrial model that is increasingly difficult to manage with the productive paradigm of the twentieth century. The recent generalisation of the term "Anthropo- cene" refers precisely to the increased importance that man has over na- ture, to the point of being considered as a relevant geological factor. This role has to do with the productive paradigm of the twentieth century, based on a linear and de-localised economy, the attributes of which can be seen in the consumerist vocation of most of the cities today. Indeed, on the one hand, cities are framed in a linear economy by being structured according to the scheme that receives resources and returns waste. On the other hand, cities operate according to the de-localised economy, depending on produc- tive centres away from the main urban consumption poles.

This huge abyss that separates production centres and consumption poles causes several logistical paradoxes, as the processes of extraction, manu- facturing assembly and consumption occur very often in uneven and not always proximate geographies, thus exponentially increasing the footprint. Irrational routes, unreasonable consumption and territorial zoning are just some of the anomalies that compromise the efficiency of a more and more swollen and unsustainable logistic. In addition, it is a protocol that fosters a profile of citizens who ignore the origin of the products they consume, reducing therefore their critical capacity. The commodified city of the twen- tieth century has become the image and resemblance of the productive para- digm that will find its most immediate limit in the shortage of "natural capi- tal", not only because of the exhaustion of easily accessible fossil resources, but also because of exceeding the ecological resilience of the planet. How- ever, such technical developments as new manufacturing technologies or cultural values like the recently generalised concepts of circular economy, will also imply a strong limit that will emphasise the contradictions of the established model even more strongly.

At the end of the 20th century, this model has made a last-ditch effort to keep up. The Post-Fordism and Toyotism have added some interesting con- cepts to the system such as Just-in-time production, the Japanese method of five zeros or the multifunctional worker, but in no way have these new de-velopments meant a qualitative change in relation to the relevant models. On the contrary, the production has remained mechanical, massive, serial, linear and de-localised.

Productive networks
At the end of the twentieth century the first signs of a shift in thinking appeared. The Promethean narrative that had advocated indefinite progress since the Scientific Revolution began to be questioned since the Second World War and was openly rejected in May 1968. Some sectors began to realise that the productive model adopted since the first industrial revo-lution had a limit whose sorpasso could take the planet to the edge of the collapse.
In that sense, the founding of the "Club of Rome" in 1968, a non-govern- mental scientific organisation that denounced a whole series of ecological, sociological and political limits that were reflected in the well-known re- port "The Limits of Growth ".
From there a series of political and environ- mentalist movements emerged - such as slow food and after that slow city - that placed value on principles of the ecology as circularity, autonomy, network or interaction.

Parallel to this process of ecological awareness and conceptual abstraction, the awakening of the 21st century has witnessed a series of technical ad- vances of high relevance for the field of production: The generalisation of the internet, especially the "internet of things", and the emergence of digi- tal manufacturing technologies have meant a productive revolution framed in the increasingly established Information Society.
The spearhead of this revolution consists of a fundamental change of men- tality: from a production scheme based on the concept of re-production we move towards a production scheme based on the concept of co-production.

In the first case, the idea of "re-production" played a key role in the tradi- tional industry, especially through the repetition of an optimised unit chain. It was also fundamental in traditional craftsmanship, where repetitive manual ability was a sign of expertise. On the contrary, in the second case the concept of "re-production" becomes irrelevant: manufacturing singu- larity is no longer an added effort thanks to the parameterisation of the digital models and the flexibility of robotic manufacturing. However, what is fundamental is the idea of productive cooperation, though not the one understood in the way of a proletariat distributed along the chain of pro- duction, nor in the way of a pyramid system articulated through the guild trinomial "master-officer-apprentice", but the one that must be interpreted from the complexity of a cluster of entrepreneurs in the network that pro- duce and constantly exchange information. It is a system of flat hierarchy,in which the roles of the process of learning, design and manufacturing are interchangeable and stand out for the autonomy that each subject possesses over his work, despite being nourished and owing its existence condition to the presence of the group.

The scope of this new productive paradigm is still undefined. For now, the most relevant case of this system consists of the global network of Fab Labs, digital fabrication centres that are connected through the network and are capable of manufacturing almost anything. The initiative was born in the early twentieth century at MIT in collaboration with the Institute of Advanced Architecture of Catalonia, and in less than 15 years its presence has multiplied all over the world. It proposes a neighbourhood production model in which five fundamental characteristics that distinguish it from the previous model stand out. First, it is a multi-scale process, in which a local area of manufacture with a planetary scope of design and communication is combined. Second, the concept of uniqueness ceases to be an exception because it can be mass produced: the design objective is no longer just a figure but also a formula. Third, the interchangeability of roles is constant, as the designer, the manufacturer and the customer alternate their roles frequently, something unheard of in the industrial model of the twentieth century.

Fourth, it is an extroverted process, with a high degree of global interaction, open and very far removed from the guild secrecy proper to other times. Finally, the maker has a holistic view of the production pro- cess that allows him to have a high degree of autonomy, both for the ease with which he can access the know-how and for the versatility that he has. However, this scheme emerges from a wider phenomenon. Several authors have proposed the concept of the Third Industrial Revolution to explain the productive change that we are facing. The First Industrial Revolution re- lied on coal and printing as a source of energy and communication respec- tively, while the Second Industrial Revolution relied on oil and telephone for such needs. However, the Third Industrial Revolution would base its development on the binomial Renewable Energies and Internet, something that would lead to other phenomena such as smart grid, electric cars and self-sufficient buildings. In addition, in recent years, the implementation of artificial intelligence, nanotechnology or bio-genetics are assuming a step forward in the same direction through the robotization "on site" of a large part of the productive processes.

This is an issue with some risks: if the first industrial revolution created the working class, the latest developments in artificial intelligence threaten to create the non-working class, that is, the emergence of a voluminous total- ly unemployed demographic sector that will need new political responses.
Productive cities
This productive scenario supposes the possibility of carrying out two fun- damental economic transformations: The transition from a linear economy to a circular economy, and the transition from a delocalised production to a localised production.
Beyond the citizen generalisation of concepts such as recycling, self-management or km0, it is fundamental to study what are the urban derivatives that this new productive equation suggests: if the productive paradigm of twentieth-century cities has been based on the con- sumption of resources, stock, and waste generation, it seems that the 21st century can be at the forefront of the productive city return.

But it would no longer be a question of the productive city of the medieval city's trade union production, or of the proletarian production of the in- dustrial city, but of a global, open and networked city operating under the umbrella of a new urban paradigm: From a PITO (Products In Trash Out) scheme based on importing products and exporting waste, we move to a DIDO (Data In Data Out) scheme, based on importing data and exporting data. That means that the main element that enters and leaves the city is information, because much of the rest of the products are designed, man- ufactured, produced, distributed, consumed and recycled through a fun- damentally urban cycle. In this sense, it is necessary to understand urban production in the broadest sense of the term "production", because it is not only the manufacture of objects, but also the production of other resources such as energy, food or knowledge.

The urban strategy that underlies this model is that of decentralisation. Such initiatives as Fab Labs are considered as systems of units that are essentially distributive, and precisely because of this they can act simulta- neously in the locality and in the global network, reducing practically to a zero the logistic paths and zoning processes of the traditional industry. The urban energy production that is characteristic of the 21st century is also formulated in the similar terms, since on the one hand its potential lies in the buildings converted into the sustainable energy plants, and on the other hand in the intelligent energy distribution networks.

In the same vein, the food production strategies have traditionally crystal- lised in urban garden systems that replicate on a smaller scale, methods that are typical of the rural world: several of the latest technological ad- vances such as aquaponics and hydroponics allow an urban crop to be cul- tivated with the much more intensive production and above all it is open to all types of environments, both outdoor and indoor. The implementation of all these urban production tools involves the pos- sibility of launching a fundamental change for the city. We are faced with the challenge of designing and managing urban processes that go beyond the simplicity of the linear and zoned mechanisms that have characterised the productive paradigm of the twentieth-century cities.

In this sense, the great difficulty will be to know how to synchronise the development of
the activities of productive agents in two directions: first, in relation to themselves, and second, in relation to the urban processes of another na- ture linked to social, cultural and political use of public space. It is an open scenario, in full evolution and with a great journey ahead that will require unprecedented urban approaches to be able to manage in time and space a real ecosystem of performative agents with a very peculiar task: to re-pro- gram some urban structures of the 20th century with the productive logics of the 21st century.

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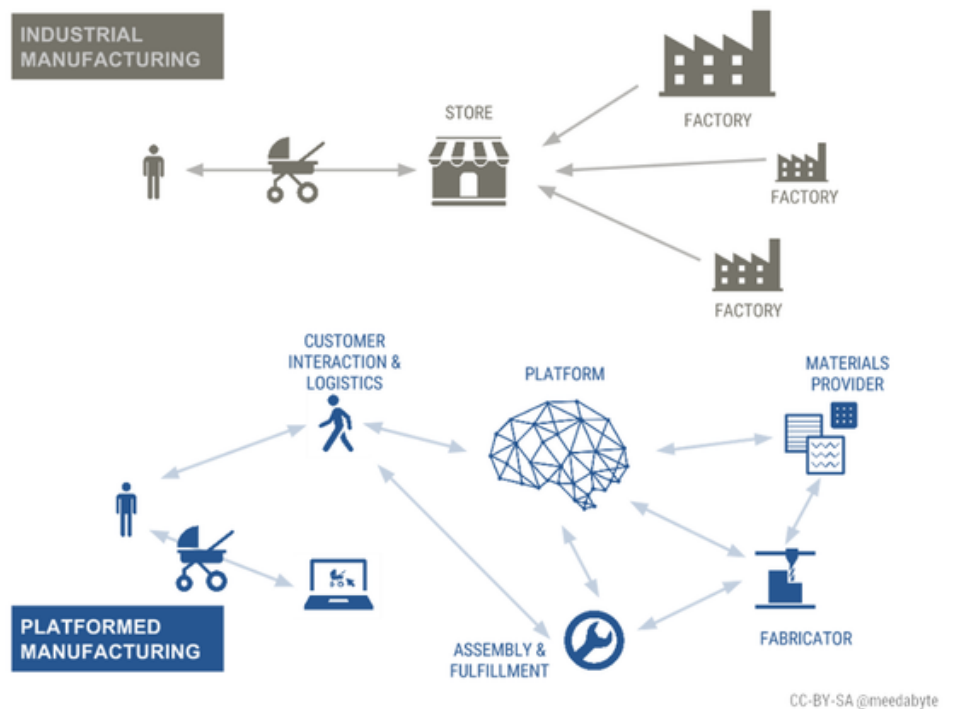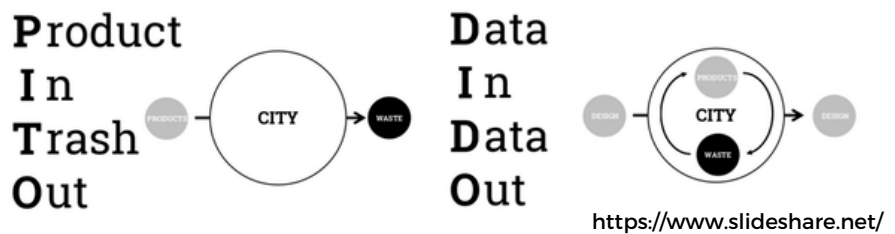
Industrial Manufacturing vs Platformed Manufacturing

CHAPTER 5

URBAN METABOLISM
AGAINST
URBAN GROWTH

HONEY, I HAVE GROWN INWARD!

CHAPTER 5.
HONEY, I HAVE GROW INWARD!

The apparent dichotomy between nature and city has been one of the biggest urban debates of the twentieth century. Traditionally presented as opposite, the study of the interrelationship of these two notions has embodied many of the most representative urban projects since the Industrial Revolution, although none of them have proposed a radical integration between both concepts. However, there is a germinal link between them: the city owes its origins precisely to nature, and in particular to its domestication, since it was nothing else but the predominance of agriculture that allowed the nomadic societies to settle down and give birth to the first proto-cities. Throughout the 20th century, the urban reading of the natural event oscillated between aesthetic interpretations and hygienic interpretations. In both cases, it did so given the understanding of nature as a true mother nature, harmonious, total, balanced and perfect, only disturbed by the human being and his presumed irresponsibility. A nature that in the end claimed to be a secularised version of the Garden of Eden and often referred to as green ecology. However, at the beginning of the 21st century and parallel to a series of innovations in the field of biotechnology, this conception has been transformed.

We are becoming more familiar with a more operative and manipulative nature, an agent that is openly imperfect in relation to our needs, and that we can alter at our convenience thanks to the capabilities that the latest advances in biotechnology provide us with. It is an understanding of nature very close to that of a continuous culture/nature which finds its place in such recent expressions as Dark Ecology or Grey Ecology.

In this context, each time it seems to be more evident that the role of nature in the urban contexts cannot be reduced to a mere contemplative activity. On the contrary, it has the potential to appear as a performative agent capable of altering urban parameters such as temperature, humidity, co2, oxygen, water quality, etc. In addition, the increasingly intimate integration between nature and urban settlements allows cities to be understood as a true metabolic organism: they are not reduced to inert structures but behave as processors and condensers of energy, food, raw materials and information. This is a completely new scenario in urban design, that although has not yet consolidated firm alternatives to the protocols of the twentieth century, appears to be a fertile and promising field.

Nature of city history
The idea of a "performative" nature integrated into the urban fabric has a long historical and geographical trajectory. The Roman law was probably the first legal body to establish and demand such a relationship: only those families who possessed a certain number of acres of land could be considered as the ones belonging to the Roman community. Otherwise
it was considered that any such family could not be autonomous, and that incapacity reduced their rights as citizens. In fact, the etymology of the word "hortus" as Roman law interprets it up is very similar to that of "private fencing", and far from having a rural character it is fully associated with an urban context.

The Middle Ages also witnessed similar practices. In several European cities and in small walled towns, the presence of cultivable green space in their interior was considered essential. The reason for that was to ensure on the one hand the daily production of food in times of crisis, and on the other hand, to resist the frequent sieges that the settlements of the Middle Ages often experienced.

The strategic importance of these agro-urban spaces was noted and promoted by such governors as Charlemagne who promulgated the "Capitulare de Villis" in 770: that was a scope of guidelines and prescriptions for articulating urban gardens and suburban farms in the main settlements of the old kingdom of the Franks.
Thus, the separation between "urbs" and "rus" was a conceptual rather than a real limit, an ideological tool to separate two realities with the intention of not creating contamination between two different worlds, each one ruled by very particular laws.

This balance was radically altered with the arrival of the Industrial Revolution. The deterioration of living conditions in rural communities combined with the beginning of the fast urbanisation changed Europe's urban and demographic landscape in just a few decades. In England, after the implementation of the "New Poor Laws" (1834), the construction of more than 615,000 hectares of community gardens was financed, especially in the suburbs of the industrial cities such as London, Birmingham and Liverpool. In fact, at the end of the nineteenth century, the Industrial Revolution raised public spaces from a new perspective. These were conceived in opposition to the terrible conditions of work existing in the industries and to the ill health of the agglomerated working districts. Closely linked to the public space, the notion of green space was constituted as an ideal instrument for the promotion of health and urban well-being.

Later in the twentieth century, the need to have public green spaces within the urban fabric for hygienic, social and aesthetic reasons was established. However, the arrival of the two world wars and the urgent necessity to provide the troops with the food supply at the front placed urban green spaces in the productive sphere once again. The agrarian industry proved to be insufficient against such a company and several British cities had to reconvert their quiet green spaces into the food production machines. Such campaigns as "Dig for Victory" or "Garden Front" promoted the use of public parks, soccer fields, industrial yards and royal gardens as real urban food factories.

However, the arrival of the Welfare State and the generalisation of the lifestyle in the second half of the twentieth century reduced the role of the nature in the cities to a basically contemplative role once again. Indeed, beyond the aesthetic and psychological benefits of nature, in the last decades its presence in urban environments has lost the operative and productive vocation that it had enjoyed in other occasions. On the other hand, the segregation and zoning of the modern urbanism of the twentieth century has prevented a much more holistic reading of the city, approaching it as if it were a closed element rather than a metabolic organism.

Operative nature
In the West, nature has traditionally been understood as a "mother nature", a harmonious, balanced, kind, beautiful, total and perfect nature, only disturbed by human beings and their technical artefacts. An approach
that in Zizek's words would be nothing more than a secularisation of the Garden of Eden, in which nature would have maintained a divine air that from the end of the century would have been ideologically embodied in the concepts of Ecology and Sustainability, above all in its most radical and fundamentalist aspects regarding the human activity.
In this sense, both are presented as an unquestionable authority, they include within them the notions of punishment and sin, define moral values, obstruct alternatives and, above all, they often appear as a remarkably reactionary force at the disposal of any justification againstprogress.

In any case, we are no longer faced with the "mother-nature" we described previously, but with a "techno-nature" that besides being operative, is also easily manipulated, imperfect, catastrophic and holistic. We move from a green ecology towards what in certain circles is known as a dark ecology, an expression in which the meaning of the word "ecology" has been expanded to include also technological and human agents.

Indeed, the activity of these agents also has huge natural consequences: beyond the global warming and the sea level rise, humans can produce important natural disasters much faster and inadvertently. A good example of this is the barrier that the Chinese government built in Yunnan: as was demonstrated years later, it was responsible for the great earthquake that struck its population in 2014.

Since the end of the twentieth century, a relationship of continuity between human beings, technology and nature has begun to settle. They have ceased being independent agents and have come to share the same spacen which they establish a network of horizontal interrelationships. In this sense, in the last years this trend has been accentuated until crystallising in a continuum of nature-culture where it seems to be more and more difficult to establish differentiations. One of the main causes of this phenomenon has to do with the progress of biotechnology: the cloning of the Dolly sheep in 1996, the complete development of the human genome in 2006 and the creation of artificial DNA in 2016 implied important advances that take place every ten years regarding the understanding and especially the manipulation of the phenomena that were considered exclusive to the nature.

There are many socio-cultural derivatives that have taken place with respect to these three advances: Stelarc works of art, especially ExtraEar in 2007, the case of Neil Harbison and his Eyeborg in 2005, the rise of the auto-fabricated or elitist prosthesis, as in the case of Pistorious, the first bacterium synthetically produced in 2010 by the biologist CraigVenter, the multidisciplinary exhibition "Alive: New Design Frontiers" (2013), and finally all the advances produced by the combination of the nanotechnology emergence and the development of neurology, with some fascinating examples such as the first robotic arm moved with the mind in 2016 or the first head transplant planned for the end of 2017.

Urban opportunities

One of the great challenges of the 21st century urban planning is to propose an urban interpretation that would be capable to be aligned with a conception of nature that has nothing to do with the vision that prevailed in the 20th century.

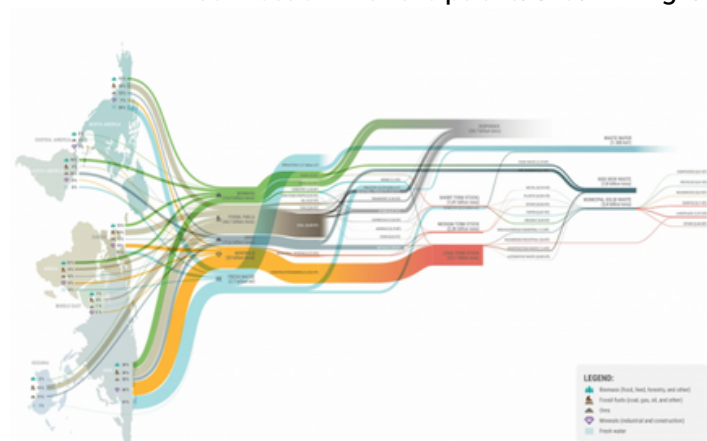In this sense, the idea of re-naturalisation of the contemporary city can follow several lines.
The most important idea in understanding the city as a metabolism consists in approaching it as an open body in which the natural environment, the infrastructures, the public space, the information and the inhabitants are interdependent and appear as a whole. Between each of these agents there exists an exchange of matter, energy and information, the study of which allows to establish forecasts of the raw materials demands and the impact that their use has on the biospheres.
Far from the functional separation of the Modern Movement, the proposed scheme bases its potential on the operational aliasing of each of the systems exposed, extending the traditional scope of the concept of ecology to assume also technological and human agents.
Thus, cities would no longer be seen as inert structures. On the contrary, they would be interpreted as great processors of resources in close relation with the nature that would no longer act as a "context", "container" or "environment" to respect, but as an agent to cooperate with and in the same shared space.

Source: Circular Design,
Ellen Macarthur foundation, 2018

Source: Prototyping. Interfacing. Platforms.
Connection with the public. Urban living lab