

Community Resilience Through Exaptation. Notes for a Transposition of the Notions of Exaptation Into a Design Practice to Promote Diversity and Resilience as an Alternative to Planning Determinism During Crisis.

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Abstract

The cities planned to date are the main cause of greenhouse gas emissions. Thus, it is now necessary to study an alternative way of designing resilient cities. Starting from this consideration, this text is an exploration of the possibilities of using non-deterministic tools, therefore not suitable for designating a use (function) from the planning stage, as a way to respond to the uncertainties of the future. To do this, we hypothesised a methodology that compares biology with architecture and, in particular, natural selection with design. The components of the natural selection's aptation are, in fact, both deterministic (adaptation) and non-deterministic (exaptation). While adaptation is a concept widely studied in architecture, there is no literature regarding the study of the mechanisms of exaptation, as defined by Stephen Jay Gould, despite the obvious practical applications of this principle in city planning. From the studies carried out, the difficulty of overcoming an exclusively deterministic planning emerges, above all, because of some prejudices in the form of reification, including the 'recapitulative' reading of the city. In conclusion, the diversity of subjects who can contribute to city planning is essential to increase their resilience in view of future unexpected effects of the global crises.

Keywords

Sustainability; resilience; exaptation; informality; reification.

Background

While sustainable design is aimed to mitigate the effects of climate change through the reduction of impacts, urban resilience deals with the crises beyond the point of no return. On the one hand, thus, resilience confirms the objectives of sustainability; on the other, it imposes its expansion towards adaptation strategies to future scenarios that are constantly changing and largely unpredictable due to the complexity of the feedback phenomena (Melis, 2020a; Melis & Foerster, 2020; Melis & Medas, 2020; Melis, Medas, & Foerster, 2020).

In times of global crisis, radicalism is, therefore, a need: any scenario hypothesised to date, and over the past two centuries, has failed, to the point of transforming solutions into problems. The heroic modern city, founded on specialisation and mass production, is today the main generator of greenhouse gases. And even the much admired Eighteenth century city, with its elegant boulevards, can generate a majestic heat island effect, like the one which caused an unprecedented number of deaths in 2003 in the Haussmanian Paris.

The planning in which we believed, imagined the future as a static picture, as a result of an alignment to an alleged linear growth chart. The resilience of the city, therefore, in the long term, depends more on the immediate cultural change of the whole society than on its future planning made today, for example under the influence of the pandemic crisis. The failure of deterministic planning requires, in fact, shifting our attention from viewing a scenario set at a certain moment in our future, towards the design processes that allow us to reproduce urban systems capable of reconjugating and adapting to scenarios, even unpredictable ones. The idea of design as a process, rather than a scenario, is not new. However, process and systemic design have often been confused with the reference to a theoretical endogenous transformation of the workflow, and not as an evolutionary transposition of the project.

Huxley Chessboard

«...much as we may love ourselves, Homo sapiens is not representative, or symbolic, of life as a whole. We are not surrogates for arthropods (more than 80% of animal species), or exemplars of anything either particular or typical. We are the possessors of one extraordinary evolutionary invention called consciousness - the factor that permits us, rather than any other species, to ruminate about such matters [...]. But how can this invention be viewed as the distillation of life's primary thrust or direction, when 80 percent of multicellularity (the phylum Arthropoda) enjoys such evolutionary success and displays, over time, no trend to neurological complexity through time - and when our neural elaboration may just as well end up destroying us as sparking a move to any other state that we would choose to designate as 'higher'?».

This preliminary consideration by Stephen Jay Gould, in

Full House (1996, p. 15), leads us to reflect on how much our society has been conceived to respond to a superior perception of ourselves, and, therefore, to last for a limited time. The city, as the most 'advanced' product of man's neural capacity, more than any of its other products, suffers from the poor resilience of this approach.

Continuing in the transposition, why, therefore, do we continually portray the pitifully limited image of the human settlement, in the form of city, village or other, which, instead, is nothing more than a brief episode in the life of vertebrates, as if it were the more advanced multicellular coexistence model? And why, then, do we fight wars to keep alive a form of settlement that inevitably seems to lead us to self-destruction? Gould is in good company here: according to Freud, the main revolutions in knowledge have led to the dethronement of human arrogance from Olympus of our cosmic certainties (from the Copernican revolution to the discovery of the unconscious, and, evidently, through Darwin's theory of evolution).

Coming to today's global crisis and recognising that the city's CO2 emissions are the main threat to human survival, it follows that the new paradigms, which presuppose a revolution in human thinking, will imply a less 'arrogant' vision of human settlements (city?) than the idea that they represent the most advanced outposts of life on this planet.

According to Gould, we are "narrative creatures", and, as such, we seek directionality, a trend towards which to turn, even if this is not real. For these reasons, before building an idea of the city, we must build a new narrative that leads to an idea of humanity as an alternative to the current one, less privileged, along a non-existent evolutionary single scale.

This recalls the allegory known as Huxley's chessboard, discussed in biology for some time, and still present, in the 1970s in the famous diagram by M. Scott Pegg, which accompanies the best seller *The Road Less Traveled*:

«The chessboard is the world, the pieces are the phenomena of the universe, and the rules of the game are what we call the laws of nature. The player on the other side is hidden from us. We know that his game is always correct, fair and patient. But we also know, at our expense, that he never neglects a mistake and has no tolerance for ignorance» (From A Liberal Education and Where to Find It, 1868).

Contemporary biologists of evolution have widely refuted this view, which, paradoxically, was proper to advocates of Darwinian theories such as Huxley, who, however, did not accept the hypothesis that humanity was a subset of nature like any other species. Mankind at the top of any evolutionary ladder is a bias, which even the supporters of Darwinian evolutionism agree, clashes with its most subversive truth and is shared by the wider society. This legacy is probably still present in our cities, or rather in their forms.

The alleged assumption that architecture and nature are

separate and equivalent players on a game table, sometimes coexisting in harmony, often in conflict, led architects to promote an alternative category of existence called artifice, into which cities and buildings fall.

Exaptation

«Adaptation has been defined and recognized by two different criteria: historical genesis (features built by natural selection for their present role) and current utility (features now enhancing fitness no matter how they arose). Biologists have often failed to recognize the potential confusion between these different definitions because we have tended to view natural selection as so dominant among evolutionary mechanisms that historical process and current product become one. Yet if many features of organisms are non-adapted, but available for useful cooptation in descendants, then an important concept has no name in our lexicon (and unnamed ideas generally remain unconsidered): features that now enhance fitness but were not built by natural selection for their current role. We propose that such features be called exaptations and that adaptation be restricted, as Darwin suggested, to features built by selection for their current role» (Gould, Vrba, & Pievani, 2008).

According to their Promethean nature, it could be said that men interpret design as a replica of the deterministic mechanisms of natural selection known as adaptation. The deterministic design of the cities, as the main cause of the emissions at the origins of the environmental crisis, is the clearest evidence that we were wrong: artifice as a category is a pure intellectual invention, and the only consequence of imagining ourselves as competitors of nature is our self-destruction. It follows that, to adopt a truly ecological design, the definition of exaptation, an alternative to adaptation, can contribute to a better understanding of the development dynamics of the cities. The opposition formal-informal, intended as a contrast between a deterministic and anti-deterministic planning, seems to me the architectural concept most matching to the biology definition of adaptation - exaptation. When we talk about informality we usually refer to settlements lacking in adequate infrastructures for potable water and hygienic-sanitary services, with low quality of life. Namely the poorest areas, those not based on the design efforts of urban planners and architects.

The planned city - the 'evolved' concept of the urban settlement - contributes to the environmental crisis, which affects dramatically the life in the informal settlements. Paradoxically the latter are indicated as a problem, rather than the 'victim'. If, however, we think of a more extensive definition of informal, such as to include, for example, also the phenomenon of temporary appropriation of public space, we can find creative and unexpected solutions and behavioural practices of low environmental impact, including coexistence with non-human species (Lara-Hernandez, Coulter, & Melis 2020; Lara Her-

nandez & Melis, 2020; Lara-Hernandez, Melis, & Caputo, 2019; Lara-Hernandez, Melis, & Lehmann, 2019, 2020, pp. 11-26). Obviously, the idea is not to put a positive spin on infrastructural shortcomings and social pressures. Instead, we need to think about the dynamics of adaptation activated in places, like the Algerian El Houma, the historical centre of Mexico City and the suburbs of Akure, analysing their value as a possible antidote to design determinism (Ijatuyi, Ayoola, & Melis, in press; Khemri, Caputo, & Melis, in press; Khemri & Melis, in press; Khemri, Melis, & Caputo, 2020).

The discussion, here, is not intended to exclude determinism as a planning practice. It remains a fundamental component, as adaptation is for natural selection. It is, however, a matter of recognising this second mechanism of use for the survival of elements that were born for another function. Consequently, we could speculate that it is a back-up mechanism capable of responding to crisis conditions. Thus, a parallelism can be built between linear logic, to be used as a standard survival mode and, therefore, as a deterministic instrument of adaptation, and the crisis mode that depends on the activation of associative thinking and which, perhaps, leads to the design version of adaptation. In order that the analogy with evolution does not remain a pure theoretical speculation, it is, however, necessary to understand what are the practical modalities through which the exaptation operates in such a way as to increase the chances of survival of the species (Gould, 1991). Gould, for example, has explained that a variability of forms responds to unpredictable environmental conditions. These proliferating and redundant forms, which can be coopted to fulfil an unforeseen function, are called 'spandrels'. The classic example is the sixth finger of the panda, a previously existing bony growth that became a tool when the animal - originally a carnivore - wound up handling bamboo to gain its nutrition (Gould, 1982, p. 22).

The redundancy and variability of forms offer incredibly practical applications for urban resilience, similarly to exaptation (Gould, 1991), seen, in design, as the capability of cities to adapt to unexpected conditions. What might happen if, like the panda, we began to use forms that we already have (and now consider useless), as tools to cope with the issues of the present? If we intend informal design as a planning approach based on functional cooptation, it can teach us a lot regarding alternative, non-anthropocentric processes of colonisation of the biosphere.

Reification

As humans, we often, *«abstract the variation within a system into some measure of central tendency, like the mean value -and then make the mistake of reifying this abstraction and interpreting the mean as a concrete thing»* (Gould, 1996, p. 40) Known as "reification", this is "a legacy as old as Plato". The reification is, therefore, *«our tendency to abstract a single*

ideal or average as the essence of a system, and to devalue or ignore variation among individuals that constitute the full population» (p. 40). This happens because we are «story-telling creatures, products of history ourselves. We are fascinated by trends, in part because they tell stories, by the basic device of importing directionality to time, in part because they so often supply a moral dimension to a sequence of events [...]. But our strong desire to identify trends often leads us to detect a directionality that doesn't exist, or interferes with causes that cannot be sustained» (Gould, 1996, p. 30).

«A focus on particulars or abstractions (often biased like the lineage of Homo Sapiens), egregiously selected from a totality because we perceive these limited and uncharacteristic examples as moving somewhere - when we should be studying variation in the entire system (the 'Full House' of my title) and its changing pattern of spread through time» (Gould, 1996, p.15) Transdisciplinarity, therefore, is an essential discriminant to reduce the risk of reification, in the study of the phenomena of the history of architecture and civilization, which have developed, respectively, over the past two-thousand years and the past seventeen thousand years. In palaeoanthropology, the evolution of man is measured in the order of hundreds of thousands of years. In biology, the evolution of organisms is measured in millions of years (Melis, 2020a; Melis & Foerster, 2020; Melis & Medas, 2020; Melis, Medas, & Foerster, 2020).

Climate change studies by Michael Mann are an emblematic example of the contribution of transdisciplinary research in overcoming reification, due to lack of information. Twenty years ago, the graphic chart, drafted by the trio Mann-Raymond-Huges, and indelibly renamed *Hockey Stick* by Jerry Mahlman, irrefutably demonstrated the existence of global warming and its anthropogenic origin, despite a general conviction that global warming was a cyclical fluctuation of the climate (Melis & Foerster, 2020). The hockey stick is epochal, both for the data collected and for the introduction of an innovative and transdisciplinary methodology. Thanks to the collaboration with Raymond S. Bradley, also a climatologist, and Bradley Malcolm K. Hughes, professor of dendrochronology, it was possible to extend the results to different regions of the globe and for long periods, through the intersection of the quantitative data coming from the rings of the trees, those of cores in the ice, corals and lake sediments. The trees proved to be a climate seismograph of absolute precision, capable, for example, of confirming the evidence of the presence of El Niño in 1791 and the absence of summer in 1816 (Melis & Foerster, 2020). Until then it had not been possible to distinguish the normal fluctuations of the climate compared to a unique event such as that described by the hockey stick. Thus, if the historian of the city, as well as any other human, transforms their abstractions into empirical facts deriving from a few hundred years of observation, how many times have planners designed cities, or

transformed them on the basis of reification?

Whether it was an unshakable trust for the Modern, or for the Marxist criticism of post-Fordism, each interpretation risks being a mere scenario of a non-existing progress to be aimed at or decadence contrasted with. If we consider a time span of 200,000 years - twenty times more extensive in the history of humanity and about 40 times more extensive in the history of cities - we could detect environmental crises comparable to the present one. Consistently, we will find more useful answers to address the issue of global crises in those disciplines that have already developed research over such long periods, such as archaeology, palaeoanthropology and biology, rather than in the history of architecture. This approach also involves the questioning of millennial paradigms such as the binary model of the human settlement city-countryside, or the attribution to man of creative roles in society. Unlike the autonomy of architecture, transdisciplinary research, therefore, lays bare the senselessness of constructing visions on trends, which manifest themselves in a very short time, and which lead us to confuse a symptom, like the current pandemic, with the cause, that is, the environmental crisis on a global scale. If the immutable categories of architecture based on deterministic dichotomies such as artifice-nature, on which our idea of design is based, enter into crisis, evidently it is the design itself that becomes obsolete. To date, the architects move with the speed of the most inertial part of the society, believing that the immediate danger, like Covid-19, was our main concern, also for the future, without grasping the extent of the transformations, slow for humanity, but very rapid and inexorable, if read in the light of palaeoanthropology. Some of us have now rushed to hypothesise future scenarios based on the need, for example, for social distancing, which stands as an evident reification.

These are certainly necessary projects in the immediate term; however, the strategic component of the discussion is missing from the debate. For instance, moving to internal villages, as suggested by many parties, is desirable, if this contributes, in some way, to mitigate desertification or the tropicalisation of the climate. It should certainly not be proposed with the scope to offer more opportunities for social distancing without considering potential infrastructural consequences and environmental impacts in the abandonment of settlements compact models. If, inspired by the three months of lockdown, we risk proposing permanent changes to our urban fabric, we may pay the price in the coming years, due to the rigidity and limited approach. A similar polarisation of trends can be observed between those who wait for everything to return as before and those who have developed a real obsession with the 'all online, immediately'. Thus, we risk neglecting, once again, the interpretation key on the complexity that the transdisciplinary reading of environmental phenomena has given us for some time. Moreover, the complexity is also synchronic: everything

that happens today in the western world has already happened elsewhere in recent times.

Ontogeny and Phylogeny: the Recapitulation of the City.

«Evolution occurs when ontogeny is altered in two ways: when new characters are introduced at any stage of development with varying effects upon subsequent stages, or when characters already present undergo changes in developmental timing. Together, these two processes exhaust the formal content of phyletic change; the second process is heterocrony» (Gould, 1967, p. 4).

Before the emergence of the biology of evolution, thanks to molecular genetics, the recapitulation theory stated that the development of the embryo of a living being (ontogeny) occurs in stages that recall the stages of the evolutionary development of its species (phylogeny) starting from the most remote ancestors. The theory is often summarised with the famous formula created by Ernst Haeckel: "ontogenesis summarizes phylogeny". Strongly present since the time of Aristotle (Gould 1967, p. 5), and, despite its success and its instrumental interpretation during Nazism, the theory of recapitulation still enjoys credit in many scientific disciplines, such as, for example, glottology.

At the same time, precisely the issue of Nazism has also pushed aside Van Boer's interpretation which, according to Gould, still has theoretical validity in opposition to Haeckel's recapitulation. However, there is no literature in architecture on recapitulation regarding the development of the city, despite this seems to be the only reading made by historians on the city (albeit through the use of different definitions). With years of delay, therefore, the recapitulatory idea of the city has never been subjected to real criticism, although, in one way or another, each architectural critic's book interprets the city as a progressive evolution of the previous ones, in a 'summary' form. Hence the ontogenesis of the contemporary cities includes a 'recapitulation' of the phylogeny of the previous ones. This Haeckelian reading of the city, which also includes the accelerations, the crises and the condensation in it of the traces of previous cities, has led to dogmas regarding the untouchable manifestations of architecture of the last two hundred years. In evolutionary terms, if we wish to overcome the recapitulative concept of the city, as a reification of the progress to which it should aspire, what remains is the aim at complexity and variability of its components (spandrel), as a possibility of adaptation to unpredictable events (resilience), through the functional co-optation of these components (exaptation). Although apparently very different points of view are encountered, from Leonardo Benevolo to Manfredo Tafuri, none of these critical positions on cities, therefore, question the general urbanisation paradigms: the different perspectives which fuelled the discussion on the city belong to and represent a very limited portion

of the human society. The differentiation of points of view, in architecture criticism, has not led, until now, to an effective increase in diversity.

Diversity and diversification, in transdisciplinary terms, cannot be superimposed and are both pivotal components to guarantee the resilience of a system. In addition, both different and diverse positions should provide an equivalent, and not alternative, contribution to recurring or dominant thinking (thus ensuring a greater potential for resilience).

Towards Diversity

A serious side effect of the reification of trends is the underestimation of some phenomena that do not align with the narrative of linear progress. The Covid-19 narrative, told as the story of a virus, similar to the Spanish flu, that triggered a sudden pandemic, which affected everyone, without distinction, will lead to a different response than that referring to a chronicle of a virus spillover, prompted by environmental pressure, which has reached the heart of the West, in a perhaps less dramatic way than what happened in the Kenema slums, in Sierra Leone, due to Ebola. The narration is important, because, in the second case, a designer from Guinea (or an NGO) could hypothesise a different scenario for the future of our cities, but just as useful because it is built, perhaps, on experiences in the city plagued by epidemics and endemic diseases. It can be observed, in fact, that the attention towards extemporaneous solutions, and the obsession for the consequences of a symptom, rather than towards the structural causes of the crisis, is proportional to the little diversity of points of view and the limited diversity of subjects who tell the story of the pandemic. In simpler words, the idea that the crisis from Covid-19 is resolved with solutions 'as needed', such as larger houses, plexiglass partitions, or, more seriously, with better hospitals, is likely to be, once again, the narration of those who live in the north of the world. Each story has its own coefficient of importance, which depends on the economic and communicative power of those who describe it. Here, it is not a question of repeating the adage according to which history is written by the winners, or by the strongest. Nor is it to make morals against the cultural colonialism of the West. Instead, it is a matter of emphasising that, in times of global crisis, a limited narrative also puts the winners themselves at risk. Situations like these could also occur countless times in architecture. If we look at ancient cities like Shybam, in Yemen, we immediately realise that something is wrong with our interpretation of the urban paradigms that we consider very recent. In the past years, the underestimation of some forms of radicalism, such as the *Oasis* of Haus Rucker Co., a declared response to the development threads described in the Club of Rome Report, is an evidence of the inability of critics to read in advance the signs of changes and crises, when they get lost in the myriad of evolutionary branches, rather than aligning

themselves along an imaginary evolutionary scale of progress

The fallout in the field of design is as disarming as it is obvious. This diversity increases the breath of the narrative which, in turn, increases the proliferation of opportunities that can be functionally co-opted, exactly as organisms do in the course of evolution, when subjected to environmental crises. The success of the design processes, which aim at the resilience of the city, will be proportional to the diversity of those who participate in their realisation. It is, therefore, legitimate to ask whether a history of architecture written with the contribution of what we consider 'minorities', on the border of the empire, or of the less 'dominant' categories, in its heart, could question Huxley's chessboard.

The Female Perspective

The city we know, its organisation and, to a certain extent, its lack of resilience, are the products of a man-centred society (Kern, 2020, pp. 5-6; Johnston-Zimmerman, 2017; Melis, 2020b). To respond to the current crisis, therefore, before thinking about the project, it is necessary to invest in the processes and on the diversity of those who implement them.

In this sense, greater inclusiveness, for example, considering the female perspective, with its innovative, disruptive and original potential, not only as a gender alternative to the male one, is more important than the project or the extemporaneous scenario. We must obviously consider the risk that even the two-sex model is, in turn, an abstraction of "a single ideal aspect or an average to make it the essence of an entire system, and to devalue or ignore the variations between the individuals that make up the entire population" (Gould, 1996, p. 37).

It is, therefore, not surprising that the author of one of the very few iconoclastic texts of post-war town planning was written by a woman, not an architect. I refer to the Jane Jacobs of *Life and Death of the American Cities*, written in 1962, when the Modern was still an object of worship for many historians, and when postmodernism, as its apparent alternative, the Post-Modern, was one of the most evident manifestations of the architect's recapitulation trend (Jacobs, 1961). In the latest issue of *National Geographic*, a recent study showed that the first signs of creativity were mostly expressed by women. Rather than attributing them to women, the author of the study notes that the inconsistencies in the size of the hands measured in the cave paintings had been traced back to the young males.

Consistent with the premise, we can imagine a female city as a first step towards diversification and inclusiveness. Marco Romano, in his recent *City of Women*, claims to have found traces of the influence, always underestimated or hidden, of women in the organisation of historic cities (Romano, 2019, p. 79). The reception of some public spaces, such as the arcades in front of the shops, seems to be a prelude to the use of space by women. In some scenic features, such as baroque

facades, you can glimpse the vocation for the female declinator theatrical space in the city. However, one has the impression that Romano's, however intriguing, is rather a narrative that does not allow one to indulge in the fact that even a possible female influence in the design has gone through its reading and interpretation in the male (Foerster, 2020, pp. 146-147). It is necessary to wait to find the first attempts to reset the city in a paradigmatic way on gender diversity: it is necessary to wait until more recent times.

The first incontrovertible evidence of female influence in the idea of the city dates back to the years of experimentation of the hippie communities that had made a manifest of sexual liberation. In fact, when Jacobs wrote her revolutionary *The Death and the Life of the Great American Cities*, it called into question the dominant urban model, also as a fetish of the heroic phase of American capitalism, now dying. At the same time, this text also shows that the female perspective, less compromised by conventionality, allows an unexpected forward momentum, the same that, in architecture, had contributed to the success of architects such as Lina Bo Bardi and Denise Scott Brown (Rustin, 2014). It is surprising that Jacobs' intentions are present in a programmatic dimension, only in very recent times, as in contemporary Vienna. The Aspern neighbourhood, for example, which was deliberately designed with a clear female gender identity, offers examples of spaces on a human (and female!) scale and extended inclusiveness. All streets and public spaces are named after women, as if to say that the symbolic aspect also has its communicative importance. The 1997 Frauen-Werk-Stadt (Women-Work-City) complex, designed by women, offers a perspective on uses that are generally overlooked by men: «*the wheelchair storage on each floor and the wide stairs to encourage the interactions of the neighborhood; flexible layouts and high-quality secondary rooms; up to the height of the building, low enough to guarantee the view of the street*» (Hunt, 2019).

Two years later, volleyball and badminton courts were preferred in Margareten rather than the conventional basketball cage; the courtyards have been designed to accommodate sessions for groups of girls, to chat and look around. The quality of the lighting and the economy of the paths promote a sense of security and encourage parking (Hunt, 2019).

The debate on gender equity in Vienna, as mentioned, quickly turned towards tools for social emancipation, especially in terms of universal accessibility. Marihilf's work between 2002 and 2006 concerned an improvement in public lighting in areas which, according to preliminary investigations, caused a sense of anxiety; the traffic lights have been modified to give priority to pedestrians; public seating has increased; architectural barriers have been eliminated, so as to accommodate wheelchairs, as well as encourage the reception of elderly people. According to Giorgia Vitale, of Arup, gender equitable planning and

design must be fundamentally more inclusive in general for the whole community. If we want this to learn about the place, take care of it and celebrate the shared spaces, it is essential to rethink the city in terms of short distances and consider accessibility, aiming to welcome and use the space: more mixed use and differentiated land use, more accessible public transport, with greater frequency and options, greater security and more strategic and hybrid location of social structures (Vitale, 2020).

The aforementioned examples, therefore, show a focus on obsolete or unrecognised uses that acquire centrality in the female city as an instrument of openings towards a multisexual city, and, therefore, more resilient, but which still do not tell us much, regarding the aesthetic perception of the architecture from a female perspective. On this it would be necessary to deepen the theme, starting from two perhaps more emblematic authors: Kazuo Sejima and Zaha Hadid. The extremes of the architectural minimalism of the former, and the maximalist flood of the latter offer two opposing interpretations of aesthetic sensuality that suggest that, in addition to a universe of uses, a female architecture also opens doors to a universe of forms still unknown today.

Conclusion

In the premises we have identified a trend aimed at the centrality of man in human society that has led to a model that, today, faced with global crises, has proven to be not resilient. The diversity increases the variability and, therefore, the possibility of adaptive and exaptive transformations. Justice and equity are, therefore, not exclusively ideological categories, but express qualities that increase our chances of survival. In recent experiments, the female point of view has been fundamental not only for a greater use of space by women, but also for greater attention to minorities and less advantaged categories. In fact, the feminine perspective has allowed the development of safer neighbourhoods, with better and more accessible infrastructures, contamination and extension of conventional uses towards previously underestimated activities.

However, ecology today teaches us that the two-sex model is also a limited model. We have learnt from Gould's research that both the exclusively male and the binary perspective of the two sexes can be the result of a reification. We must, therefore, embrace the evocative complexity of cities, welcome its opportunities, precisely where our certainties are called into question. The examples proposed in this text show that the radical and subversive vision of women opens up to more extensive and inclusive perspectives that also go beyond the traditional interpretation of genres. The aim of the research was to show that the current-past male dominated city is not resilient, due to the lack of diversity. So, the female perspective is intended, in our research, as a first step to increase diversity, not to suggest an alternative female dominated model, which would effectively

lack diversity as does the male one. The case of districts like Viennese Mariahilf, for example, show that the inclusion of the female perspective has increased the inclusiveness for all, not the dominance of women's position (i.e. uses that have been overlooked appear for the first time, without neglecting the existing ones). Families with children, elderly, minorities simply find these places more safe and liveable. Our argument is that including the underestimated female perspective is a first step leading to universality, equity, and diversity. In conclusion, since the categories change over time and respond to culture, for an effective resilience of cities with respect to unpredictable phenomena, we should begin to consider the city organised according to a multi-sexual and multi-ethnic perspective, and, in addition, even metasexual and meta-ethnic. The next step is the questioning of anthropocentrism in an ecological key.

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