

THE EMERGENCE OF THE TRANSMODERN CITY

The future adaptation and evolution of the city towards sustainability can be understood as a function of global cultural change. As the values of modernity give way to the values of transmodernity, ecological concern and spiritual self-discovery will be in the ascendant. Two waves of change based on these values could shape architecture and urban design far into the future.

By Hardin Tibbs

IMAGINE AN ADVANCED city that is at one with nature, completely sustainable. This city lies in the future, built by a high civilisation that has gained the wisdom to master its soaring technological capability.

What would this city be like? What challenges would have been overcome to build it, and what would be the path leading to it? Is such a thing even possible?

Multitudes of future scenarios fan out in front of us, prefiguring our hopes and fears, our expectations and our speculations. Today's civilisation – our global urban culture – is transforming rapidly as it embarks on a journey beyond modernity. Our sense of the destination depends on how deeply we investigate our predicament. If we diagnose superficially, we may easily see a world of chaotic insurrections, in which the future city is a sprawling favela. An ad hoc urban hack, in which planning is by self-permission and opportunistic hustle. This is the Middle

Ages redux, running on dwindling fossil fuels and mobile phones, intent on evading the dying clutches of 20th century centralised bureaucracy.

But this is surely not the best we can hope for. In the original spirit of *la prospective* – Gaston Berger's normative approach to looking at the future¹ – we can try a different tack, and look to the best of possible new creation, the maximum potential of our time.

Admittedly, cities are hardly ever the result of conscious comprehensive design. We build them largely as a spontaneous collective enterprise, almost unconsciously. They are shaped by the combined interactions of cultural, social, economic, technological, and regulatory forces – a large scale fusion of desires, capabilities and constraints. They are the human equivalent of ecostructures – the term ecologists use for structures such as termite mounds and beaver dams.

Cities are where people come together, drawn by an age-old desire to be in society with others. Shared cultural values then set the aesthetic and functional aims that determine urban design interventions. And as human culture gradually evolves, it shifts the agenda of urban design and reshapes cities.

Cities express the capability of the human species at any given time, and if we defocus somewhat in time and space, we can read the overall emergent pattern. Cities may grow outside the control or deliberate design of any individual or organisation but, according to research at the Santa Fe Institute, they show a remarkably consistent infrastructural pattern everywhere around our globalised world.

Research by Geoffrey West² and Luis Bettencourt has shown that so-called 'superlinear scaling' applies to all cities, meaning that everything from the total

"It is unlikely that the planet can accommodate an urbanised humanity that routinely draws resources from ever more distant hinterlands, or routinely uses the biosphere, the oceans and the atmosphere as a sink for its wastes. Can cities transform themselves into self-regulating, sustainable systems – not only in their internal functioning, but also in their relationships to the outside world?"

Herbert Girardet in:
Creating Sustainable Cities (1999)

area of road surface and the dimensions of the sewer system, to violent crime and personal income can be predicted from the size of the city's population. Furthermore, as cities get larger they get more efficient, unlike corporations. When a city doubles in size, every measure of economic activity increases by about 15 per cent per person, along with crime, traffic and disease, unfortunately. In contrast, corporations show sub-linear scaling, so that as the number of employees increases, the profit per employee falls.

BEYOND GLOBAL SCALE:

THE RISE OF TRANSMODERN VALUES
Cities express both human strengths and shortcomings, which means that trying to understand the future of humanity may be the best way to foresee the future of the city. The humans we aspire to become will build the cities we aspire to live in.

One way to understand the future evolution of humanity is to look at the changing beliefs that determine cultural values. Social research since the 1970s indicates that cultural values around the world are shifting towards what have been called 'post-materialist' or 'cultural creative' values. The shift is being propelled by the twin forces of growing affluence and mounting global issues. It appears that the new values are now reaching a tipping point and are poised to become the dominant cultural values, first in the most affluent countries, followed soon after by industrialising countries. The key features of these new values, therefore, give a sense of the future worldview of society.

The new values include a quest for psychological and spiritual self-discovery, a desire for personal authenticity and self-responsibility, an intense concern for social justice and equity, a push for ecological integrity, and a demand that institutions and businesses respect and respond to these aspirations. Taken together, these values represent a marked shift beyond the cultural values that characterised modernity³.

Two key features of modernity have been its continual growth and its ability to transcend almost any limit. Now, at global scale, it is finally reaching limits of a type it cannot transcend – where continued growth turns into active disadvantage. To develop further means to enter transmodernity – a new era beyond the modern that is based on a different way of thinking.

In envisaging how the onset of transmodern values may reshape cities, it is possible to imagine two waves of change. These would be reflected in evolving themes in architecture and urban design that would gradually reshape the city.

The first wave of change might be termed eco-integration, and is already underway. It involves fundamental technological redesign to reduce the ecological footprint of cities and the economy as a whole.

The aim of this redesign is ultimately to address the urgent problem created by three fundamental and interrelated aspects of the global system:

- *The size of the natural global environment is fixed* (i.e. the area of the planet surface and the size of the biosphere – the planetary network of ecosystems – is not expanding)
- *The volume of industrial production worldwide has now grown literally as big as nature* (as measured by comparing the volume of industrial flows with the flows of the various chemical elements, such as carbon, in and through the biosphere)⁴
- *The growth of worldwide economic consumption is exponential* (it is doubling every 20 years, as a result of the combined growth of population and affluence).

Put together, these three fundamentals mean that, within 20 years, the volume of consumption would be (if it could get there) twice the size of the biosphere. But this is implausible, since today's pattern of economic consumption continuously draws resources from, and dumps waste back into, the biosphere, which would collapse under the load.

Systems analysis going back to the 1970s has indicated that the crunch of these three factors will make existing industrial society unsustainable within one to two decades from now⁵. In other words, the global industrial economy will collapse sometime before 2030 if we do not reinvent it to work on different technological principles, accompanied by new social values.

Looming resource and energy scarcity is an early signal of this potential collapse. This arises from using nature both as a source of raw materials and a sink for waste and pollution, on a literally plan-

etary scale. A typical example is that the amount of waste carbon dioxide released into the atmosphere – now roughly 30 billion tonnes a year – has been doubling every 20 years for the last half-century or more.

THE FIRST WAVE OF CHANGE: ECO-INTEGRATION

The new industrial operating principles would mean adapting the total use of technology around the world so that it meshes harmlessly with nature. Resource depletion would be addressed by developing closed-loop manufacturing systems, with almost total recycling of all materials and reduction of product weight. Fossil fuel depletion would be offset by developing ambient energy systems, using energy available locally in the environment, such as solar, combined with very high efficiencies on the demand side. Pollution and toxification of soil and atmosphere would automatically be reduced by closed-loop technology and use of ambient energy.

Similarly, the risk of decline in food and water supplies would be avoided by developing a regenerative approach to agriculture that recycles nutrients and avoids runoff, minimises the use of water, builds soil quality, and uses natural methods to

manage pests, assuring a sustainable supply of nutritious, uncontaminated food.

These changes would represent the technical, objective side of the first wave of urban and architectural change. On the subjective side, the domain of cultural meaning, the eco-integration wave would be expressed as an eco-aesthetic style. Biomimetic forms inspired by nature and a progressive blending or meshing of the boundary between technology and nature would gradually become pervasive.

The intense complexity and dynamism of contemporary cities and the eco-integrationist push to reduce the mass of buildings would be reflected in a shift to fluid, kinetic, eco-sensitive forms. The goal of dematerialisation, or what Buckminster Fuller called ephemeralisation, would be enabled by parametric design, in turn permitting high levels of newness, flexibility and renewability, and a reduced ecological footprint.

All new construction would use high-strength low-mass materials, for example with fine nano-honeycomb internal structure, produced on demand using local nano- or bio-tech assemblers. These would form components designed to be easily demountable for reuse or recycling.

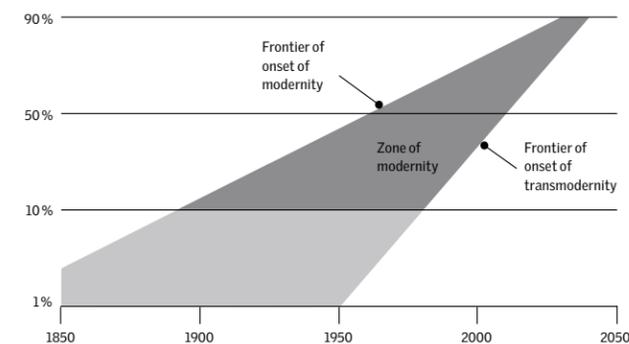
Buildings would be free to evolve from being inflexible failed predictions

(as Stewart Brand described them) to ever-adapting structures that would flow with human and ecological processes, and cities would follow. This transformation would be propelled by the mounting ecological and resource crisis during the early 21 century, but the structural inflexibility and cultural inertia of cities suggest that the changes would only take full effect over many decades. Over this time, the built environment, the ecostructure, would gradually become a series of flexible envelopes and interfaces between processes, reflecting human and natural ecologies in constant interplay. The resulting dynamic, kinetic style may come to be known as eco-morphic – the logical end-point of Patrik Schumacher's view of architectural styles as design research programmes.

THE SECOND WAVE OF CHANGE: SPIRITUAL REDISCOVERY

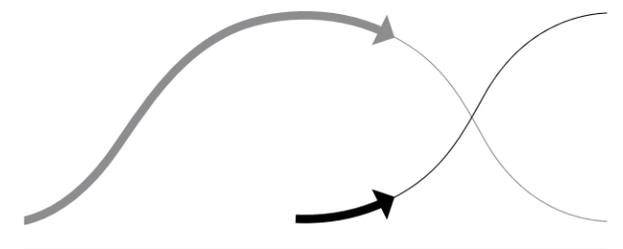
Even as the urban environment progressively makes its peace with nature, the second wave of transmodern change can be expected, perhaps building to full effect only after one hundred years or more. This wave might be termed socio-spiritual awakening, and it would arise from the quest for psychological and spiritual self-discovery in transmodernity.

Modernity as a historically brief pulse between substitution frontiers



Schematic depiction of the rising and declining cultures in the current process of cultural transformation.

(Source: Fritjof Capra)



"Clearly the problem of man and nature is not one of providing a decorative background for the human play, or even ameliorating the grim city: it is the necessity of sustaining nature as source of life, milieu, teacher, sanctum, challenge and, most of all, of rediscovering nature's corollary of the unknown in the self, the source of meaning."

Ian McHarg in: *Design with Nature* (1969)

Initially, during the first eco-integration wave of change, the aesthetics of the built environment would be predominantly biomorphic, echoing the shapes of nature or seeking invisibility in the landscape. This would not last indefinitely. The growing call for spiritual meaning and understanding would demand something deeper.

Charles Jencks has suggested that the entire cosmos can provide a new iconography for architecture, derived from the patterns of cosmogenesis. This, he says, draws a visual language from science and promises to be the ultimate referent for art and architecture. He has been exploring this potential in his own architectural and landscape work, finding inspiration in the spiral foggy traces of the sub-atomic, the great flowing arcs of galaxies, scientific notation spelled out as a pattern on the landscape.

Yet this view of cosmos as iconography refers only to the outer physical cosmos, not the inner cosmology or world of meaning that opens up to spiritual explorers. The cultural convergence of an inner search with the outer scientific worldview would re-situate the transmodern human in a cosmos that is both physical and spiritual, both subjective and objective.

To achieve this, transmodern culture must resolve the contradictions between the objective and subjective, so that the inner cosmos can be fully recognised and reunited with the outer cosmos. The perspective capable of transcending the modernist denial of subjectivity is likely to be akin to one proposed by Edgar Morin⁶. In this view, the entire objective physical universe contains the mysterious otherness that is the conscious subject, which itself holds the entire physical universe within its subjective inner universe of conscious awareness, in an endless recursive loop.

This integral perspective, a union of Eastern and Western thinking, which does not privilege either subjectivity or

objectivity, would open the way to cultural acceptance of the inner cosmos. If what we already know from transpersonal psychology and various spiritual traditions is a guide, it would reveal a complex inner structure of consciousness and being.

THE ECO-SPIRITUAL CITY

The revalidation of subjectivity would gradually alter aspects of social life, because scientific and managerial orthodoxy would no longer be free to reduce human beings to mere biological machines. This would free people to more fully respect each other as unique subjectivities, and promise a time of softer hearts, a life lived more in community.

The inner cosmos would lend itself to iconography too, just as the outer cosmos does. The fusion of the two would carry the deepest symbolic meaning of transmodernity: the process pattern of humanity as an evolving conscious being within a living cosmos.

After perhaps as long as two hundred years, transmodern humanity would find a stable but dynamic accommodation with planetary ecology, and come into alignment with the previously hidden order of a spiritual cosmos. The aesthetic expression of this cultural understanding would no longer simply follow biological forms or sacred geometry, it would be the embodiment of a deep knowledge of the underlying processes and their connection to human life.

In parallel, transmodern structures would become intrinsically eco-integrated – shaped by a dynamic eco-morphic architecture that would literally be given its form by blending with ecological processes. Thus there would be a convergence between the iconography of deep eco-spiritual understanding and the dynamic form of eco-spiritual embeddedness, and the influence of the two would become indistinguishable in the form of built structures.

This would be the ultimate eco-spiritual form of the city, in which objective process became one with subjective symbolism, creating a living form on the land, the home of transmodern humanity.

It is only possible to guess at the appearance and technology of such a city. It would be compact, eco-autonomous, a contiguous kinetic megastructure perhaps, a hybrid of building and city. Its form would be a spontaneous diagram of outer processes and an inner hierarchy of knowing flowing together, maybe a series of concentric circles, linked by radial lines and interfused by open landscape, like a vast Chladni figure.

In this ultimate sustainable city, humanity will be at one with itself, with nature and with the cosmos in all its dimensions.

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