From Bauhaus to Ecohouse: A Short History of Ecological Design

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The Sun House, by Maxwell Fry, London, 1935, is an early example of sun responsive architecture. Fry collaborated closely with Walter Gropius. Photo: Wikimedia Commons, User: Justinc
In 1937 the ecologist Julian Huxley hosted a sumptuous farewell dinner party for Walter Gropius upon the occasion of his departure from London to become Chair of the Harvard School of Design. The guest list reads as a Who-is-Who of the English scene of modernist design, but on it are also prominent ecologists, which raises the question of why they were invited to the festivity.

What brought Bauhaus designers and ecologists together was a shared belief that the human household should be modelled after the household of nature. This fusion of biological reasoning with Bauhaus design took place when the school’s faculty between 1934 and 1937 tried to re-establish the school in London after fleeing from Nazi harassment.

The Bauhaus faculty moved into a brand new apartment complex, the Lawn Road Flats, which was the first modernist residence in London. The list of carefully selected tenants included a host of intellectuals and designers enjoying what became a social hub for design. As the building’s architect, Wells Coates was in the midst of gatherings that soon evolved into the Modern Architecture Research Group or MARS. This group included notable designers such as Maxwell Fry (who collaborated with Gropius on several projects), Morton Shand, and John Gloag.

One of the chief points of debate was the role of ecology in reshaping society. The MARS group became advocates of environmental sensitivity: “There must be no antagonism between architecture and its natural setting,” they pointed out in an exhibition manifesto of 1938. A drawing of a tree growing through a building was to illustrate that “the architecture of the house embraces the garden. House and garden coalesce, a single unit in the landscape.”

This appeal reflected values and ideas promoted by ecologists such as Clough Williams-Ellis, who thought modernist design could save Britain from environmental destruction.

As a trained ecologist, Huxley took equal interest in the environment cause. As the secretary of the Zoological Society he enjoyed a spacious residence at the London Zoo, which he had made into a showroom for modernist design. Here scientists, architects, urban planners, as well as the environmentalist circle around Williams-Ellis met for discussions. Their basic idea was that old-fashioned housing design reinforced an unfortunate dualism between humans and nature, while the new Bauhaus design promised a reunion of humans with nature through healthy living.

The London Zoo became the testing ground for these architectural ideas. According to one of the zoo keepers, Solly Zuckerman, the difference between humans and animals was “almost certainly one of degree only,” and one could consequently see the life of primates as “a crude picture of a social level from which emerged our earliest human ancestors.” Visitors at the Zoo would observe their own primitive desires in animals, he believed, and it was thus of moral importance to place them in a model home for healthy living. The famous gorilla house and the penguin pool, along with a series of other buildings, were therefore built in the modernist style designed by Berthold Lubetkin.

The London writings of the Bauhausler László Moholy-Nagy may illustrate similar concerns. He and Gropius had previously compiled a series of books about Bauhaus, in which his own Von Material zu Arkitektur appeared in the English language under the title The New Vision in 1930. For many English speaking designers it became their first encounter with Bauhaus research methods. He advised them to use “nature as a constructional model” and always look for ‘prototypes in nature’ to determine...
"Functionalism" was a key word in the book. Late in life Moholy-Nagy would complain that the original meaning of Louis Sullivan's motto *form follows function* had been "blurred" to a "cheap commercial slogan" so that its original meaning was lost. According to Moholy-Nagy, it should be understood in view of "phenomena occurring in nature" where every form emerge from its proper function.5 This was also the basic assumption in The New Vision: Humans were governed by their biological nature and cultural artefacts would consequently only be functional if they confirmed to human biology. “Technical progress should never be the goal, but instead the means” for a healthy biological life, he argued.6

Gropius expressed a similar sentiment at his first lecture in London. “[T]he thesis on which the Bauhaus was built” is “that art and architecture which fail to serve for the betterment of our environment are socially destructive by aggravating instead of healing the ills of an inequitable social system.”7

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Walter Gropius

Bauhaus design will determine “the fate of our generation and the next” if it successfully uses the biological forces of life to improve social, economic, technical and hygienic matters so that society would live in harmony with nature.8

After moving to Harvard, Gropius would warn against industrialism and capitalistic greed that could come to dominate human life unless architects approached design and the environment in a responsible way. Urban environmental renewal was valuable in itself, but should, according to Gropius, also be seen in view of trying to save non-urban nature from suburban sprawl. By making cities livable one could protect their surrounding nature and the larger habitat from further development. This, at least, was what he told his students at Harvard in the early 1950s:

“[…] the greatest responsibility of the planner and architect, I believe, is the protection and development of our habitat. Man has evolved a mutual relationship with nature on earth, but his power to change its surface has grown so tremendously that this may become a curse instead of a blessing. How can we afford to have one beautiful tract of open country after the other bulldozed out of existence, flattened and emptied for the sake of smooth building operations and then filled up by a developer with hundreds of insipid little house units, that will never grow into a community. […] Until we love and respect the land almost religiously, its fatal deterioration will go on.”9
One of his students was Ian McHarg, whose *Design with Nature* (1969) became a phenomenal success and came to define the field of landscape design for a whole generation. As strange as it may sound, in this book McHarg advised his readers to adopt the life and perspective of an astronaut in trying to design with nature on the ground. “We can use the astronaut as our instructor,” he argued, as he (they were all men at the time) saw the Earth from above allowing a managerial overview of the landscape. McHarg was inspired by the astronautic sciences which since the late 1950s were working towards sending humans into outer space. The chief method was to try to build spaceships in which not only water and air but also food would circulate within what was called ‘space ecological systems’. The NASA organization would pour considerable amount of resources into researching how to build closed ecological systems in outer space in which humans could settle.

McHarg found these unworldly ecosystems for astronauts in outer space inspiring. He saw them as a model for how humans should live in harmony with nature on Earth. To him, these ecologically construed spaceships and settlements came to represent the rational, orderly, and wisely managed in contrast to the irrational, disorderly, and ill managed environments on the Spaceship Earth. Consequently, technology, terminology, and methodology developed for outer space became his tools for designing with nature on the ground. Environmental ethics became in his subsequent writings often an issue of trying to live like astronauts by adapting space technologies such as bio-toilets, solar cells, recycling, and energy-saving devices, along with a utilitarian philosophy.

McHarg was not the only environmental designer enthused by the life of the astronaut and the managerial view from without. “We are all astronauts,” Richard Buckminster Fuller explained in his famous book *Operating Manual for Spaceship Earth* (1969), which basically postulates using space ecological engineering manuals for astronauts to solve environmental problems on Earth.
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With the slump in the space industry in the early 1970s, key movers of its technology began marketing space technological know-how to the architectural community. The result was a surge in ecological remedies such as new waste disposal systems inspired by space recirculation technology, a sewage system inspired by the astronaut’s toilet, solar cell panels, and an energy efficiency system for homes that became known as ‘autonomous’ buildings.

Key ‘autonomous’ designers include early British ecological architects such as Alexander Pike and John Frazer, and their students such as Kenneth Yeang and Brenda Vale. Similar projects came along under names such as ‘bio-shelter’ and ‘integral house’ in the US by Sean Wellesley-Miller and Day Chahroudi, the co-directors of the Solar Energy Laboratory at MIT, Phil Hawes’ Biosphere 2, and perhaps most prominently John and Nancy Todd and the so-called New Alchemists at Cape Cod.

These designers have in common the fact that the buildings they designed were detached from the environment they were meant to save. Paradoxically, they came to regard the surrounding social and natural environment as irrelevant. Just like a spaceship was detached from the surrounding environment in outer space, a building designed as a self-sustained microcosm was, at least in theory, to be detached from the Earth. As a consequence, some of these ecological buildings tended to resemble spaceships by incorporating closed ecosystems, space technologies such as solar cells, and by often being isolated from the local realities, cultures, and landscapes they are supposed to protect.

A telling image of what ecological architecture came to be in the late 1970s was the attempt in 1976 by architectural students at the University of Minnesota to build their own self-sustaining ecological building with various recirculation devices. They named it “‘Ouroboros’ after a mythical dragon which survived by eating its own tail and feces.”\(^\text{13}\) In this way ecological architecture in general also became a way of designing which fed on its own ideas and gradually closed itself off from developments in the rest of the architectural community. The outside world was simply described as “industrial” and thus not worth listening to. As a consequence, many environmentally concerned designers fashioned themselves as ‘design outlaws’ on the margin of the mainstream.\(^\text{14}\)

This somewhat narrow focus on circulation of energy and efficiency of buildings came at the expense of a wider cultural, aesthetic and social understanding of architecture and the human condition. As William McDonough and Michael Braungart, two recent environmental architects, have noted about previous ecologically construed buildings, “[...] efficiency isn’t much fun. In a world dominated by efficiency, each development would serve only narrow and practical purposes. Beauty, creativity, fantasy, enjoyment, inspiration, and poetry would fall by the wayside, creating an unappealing world indeed.”\(^\text{15}\)

With the end of the Cold War, most environmental designers broke out of the intellectual capsule ecological space engineering had created for them and abandoned outer space as a source of inspiration. Those architects concerned with environmentally friendly design
focus their attention on the ways in which ecological design could benefit the client financially as new innovative technologies could harmonize the ecology and economy of a building.

Yet this somewhat narrow neo-liberalist outlook hardly moved the larger design community into action in favor of the environment. It was not until environmentally concerned citizens and politicians more recently began to demand a change in building techniques that the larger architectural community began to take an interest. One example is the rating system for buildings set up by the United States Green Building Council called ‘Leadership in Energy and Environmental Design’ (LEED), which encouraged private and public property developers to think anew about their relationship to both society and nature. This forced architects into action. They began to explore a host of new environmentally friendly technologies and building techniques spurred by the purchasing power of ecologically minded developers.

With major clients, contractors, new technologies, and know-how of a new generation of young architects in place, trendsetting designers also began to look with renewed interest at ecological design methods. They brought to the forefront the importance of the aesthetic dimensions of ecological architecture, as in the work of, say, Bjarke Ingels, Francois Roche, Louise Harpman, Mitchell Joachim, Rachel Armstrong, Alex Haw, Magnus Larssen and many, many others. Their aesthetic abilities brought an architectural movement from the margin to the mainstream of current architectural journalism.

Yet for all their inventive powers, it is worth noting that these efforts are not that different from the Bauhaus design program of the late 1930s. The attempt to base design on biological footing points back to the very core of the modernist heritage. Indeed, the program of trying to unify art and science may serve as the very definition of the modernist architecture that traces its heritage back to the Bauhaus school. As Huxley once said about the school’s founder: “[Gropius’] lifelong aim was to work for the reunification of art and science, without which there can be no true culture.”
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