ISSN: 1755-068
www.field-journal.org
vol.4 (1)

The perfect worlds of ecology

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The world of ecology is made of many small worlds. These small worlds, these ecosystems, have been studied in a tract of forest, a stretch of sand dunes, or a lake.[1] But the best way, according to a leading ecologist, is to study a small pond,[2] or failing this, a bottle full of pond water. Here, the bond between living organisms and non-living matter is immediately apparent. Producers, mainly plants, feed on non-living substances held in the water. Consumers, like insects and fish, feed on the producers. These are in turn decomposed by bacteria and become non-living or abiotic substances. Thus the circle is closed.

The small worlds of ecology are perfect worlds, or they make spontaneous progress towards perfection – towards what ecologists call a climax. They proceed in orderly "successions" until they settle in stable cycles. They are oblivious to geological time rushing along from Big Bang to entropy. They are lodged instead within the small time span that we associate with life, for which a stretch of dunes, a tract of forest, or a pond each provide in their smallness an adequate simile. They recall 16th century Mannerist landscapes, for instance those painted by Jan Brueghel the Elder. In them, the human figure is so reduced in size as to be on a level with other living creatures, from heron and fish to leopard. These paintings were called "world landscapes", each one holding a mirror to the earth, each one presenting a microcosm of the Creation as if before the Fall, at once calm and teeming with life, like the ecosystem of a pond with its even surface and its superabundance of life half-concealed beneath it.

1 See for instance H. C. Cowles, "The oecological relations of the vegetation on the sand dunes of Lake Michigan", *Botanical Gazette*, Vo.27 (2) (1899): 95-117

2 Eugene P. Odum, *Fundamentals of Ecology* (Philadelphia: W.B. Saunders and Co., 1959)

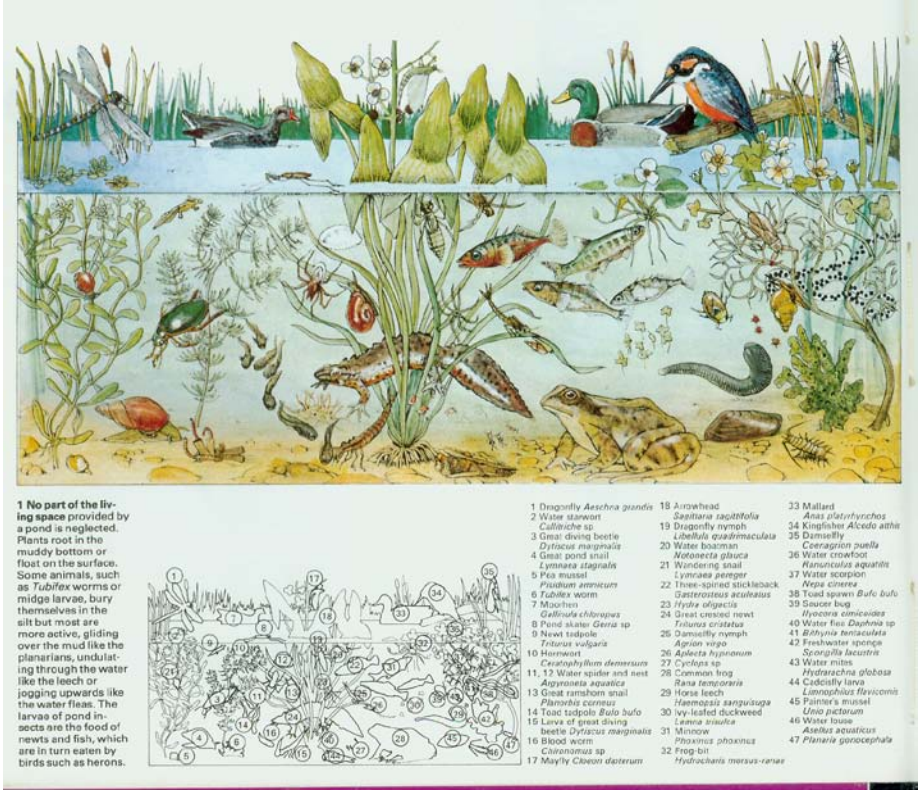

Fig. 1 "A typical pond ecosystem, The Joy of Knowledge Encyclopaedia," 1976, drawing by Brian Hawkes.

To put it succinctly, the problem of ecology is man. Within the cycles described by ecology, man introduces needs that are such as to create a continuous situation of shortages.[3] He disrupts cycles that were otherwise as perfect as the movement of heavenly spheres. Having made them acyclical, his aim is to make them cyclical again. He imagines a perfect world, a greener world in which all living matter can remain within that narrow slice of time associated with life. He envisages his task less as one of invention that one of conservation.

If the problem of nature appears to be man, the problem of man is his consciousness. Consciousness can feel to him like surplus to nature. Imagination can appear more like an embarassment than a gift, more like an inclination to meddle with the natural course of things and to mess them up. Thus the good man for the ecologist tries to write himself, as it were, out of nature. He willingly lowers himself in order to fit in more snugly within tight ecosystems. He commits himself to selfless acts of mimetism, hiding as it were behind the heron, the fish or the leopard.

Such is the attitude for instance of High-Tech architects and of the majority of building professionals. For them, architecture is a simulacrum of nature, matching its advanced technological systems, for instance air flows represented with little red and blue arrows cavorting under a smiling

3 G. Evelyn Hutchinson 'The Biosphere,' *Scientific American*, 223 (3): 45-53

sun, with systems attributed to nature. Alternatively, architects assert a cyclical process that is specifically human, a new vernacular. Architecture shall be like the tells of Mesopotamia, the man-made earthen mounds consisting of layers after layers of human settlements, upon which bricks soon crumble back into dust. Or else, instead of seeking order in time (the cycles), they shall seek order in space and invent small worlds equivalent to the already perfected forests, dunes and ponds, adding a few cycles of their own. Eco-cities for instance.

Where architecture is concerned, the problem with ecology is that it is at its best when describing small-scale environments. Typically, the main instrument of the ecologist is the quadrat, a square meter of ground on which to study plant succession in a particular region. Even with the best intentions, it is difficult to see what Masdar in Abu Dhabi, currently the main flagship for sustainable development, more than 2 miles-square, built with imported expertise, imported materials and imported labour, has in common with the objects and the concepts of ecology.

Ecology has been of great use to man, for instance in the containment of pests dangerous to crops. But it has been less successful in its description of man, a creature too restless and vain to comply with the systems of nature. Human ecology is at its best in the simplest environments, where species are few and where climate imposes strict limits on human populations.[4] It is not surprising, therefore, that some of the best work analyzing the relationship between man and the environment is to be found not in ecology but in human geography. In fact, human geography is at the origin of human ecology.[5] It does not apologize for the place of man on the earth. And it is for this reason a better source from which to build foundations for sustainable design.

The invention of human geography is credited to Friedrich Ratzel and his "Anthropogeographie". But for me the most inspiring human geographer is Paul Vidal de la Blache, founder in 1891 of the *Annales de Géographie,* author of the *Tableau de la Géographie Physique de la France (1903)* – a masterpiece of geographical writing and still one of the best books on France. He was Professor at the Sorbonne, remained the unchallenged reference in human geography well into the 1950s (long after his death), and was the acknowledged source for the historians of the *Ecole des Annales*.[6]

The subject of human geography, Vidal wrote, is the physionomy of the earth as modified by man.[7] This concise definition implies no *a priori* idea of balance, unlike ecology and ecosystems. Vidal does mention "oecology" (recently named but not yet developed into a discipline), and he defines it as "the science of local environments."[8] But – the point merits emphasis - the influence of the local milieu must be corrected by that of human commerce. In Vidal already, there is a hint that commerce is the Janus face

4 See W. E. Ekbaw's pioneering study on polar Eskimos, in *Ecologie*, vol.II. (2), 1921.

5 Pascal Acot, *Histoire de l'Ecologie* (Paris: PUF, 1988).

6 "One of the most fertile oeuvres for history, perhaps even the most fertile of all, has been that of Vidal De la Blache", in Fernand Braudel, *Ecrits sur l'Histoire* (Paris: Flammarion, 1969) p. 31.

7 To this day, the only book by Vidal de la Blache published in English is the posthumous *Principles of Human Geography* (S.I.: Constable, 1926).

of ecology, that what is unique must be complemented by what is generic, what is near by what is distant, what is familiar by what is foreign.

Long before the Earth was sighted from the moon, the perspective had changed. In a movement that seems at first contrary to ecology, we are according to Vidal looking at the relationship between earth and man from a greater distance. To his eyes already, movements in the earth's atmosphere demonstrated that no place can be seen in isolation. With our growing awareness of pollution and climate change, the atmosphere is being revalued as the necessary other half to the earth's crust. It may in fact never have had a greater presence in our lives, climate now competing more equally for our attention with events taking place on the land.

No part of the Earth can exist in isolation; all parts are coordinated. Every local study can be referred to some general law. This fundamental unity of the Earth has been recognized since antiquity, but it is only in the 19th century, in the early stages of globalisation, that it found expression in human experience. Think for instance of Jules Verne's novel *Around the World in 80 Days*. We scarcely realize how thin is the surface that makes this unity perceptible, and how intimate is its bond with human experience. The heat of the sun penetrates no further than a few meters into the ground, and it stays there for no longer than a few hours. Likewise, the events associated with climate – rivers, glaciers, sedimentation, etc. - concentrate their effects upon this veneer alone. So it is, of course, with human life that runs, globalisation helping, into and across almost every nook and cranny of the Earth.

In thrall to the market, only too pleased to comply for a demand for more and more artifice and difference, architects have preferred to ignore this terresterial unity. Seldom has their creativity been more immured from the *zeitgeist*. Buildings, we know, are responsible for some 40% of all CO_2 emissions. This fact alone should prompt at least some architects to look beyond the drafting of, and the complying to the appropriate regulations, and to make the general conditions affecting the Earth, especially climate, into a major inspiration in their work. Some have been here before. Buckminster Fuller with his concern with the Earth's resources, Frei Otto with his conception of "natural forms", Le Corbusier with his obsession with the sun, Frank Lloyd Wright with his call for an organic architecture: all founded their designs upon an understanding of nature.

Yet for Vidal de la Blache and other geographers long before him, nature and landscape were not merely abstract concepts. The unity of geography resided in the relationship between general laws and specific, concrete descriptions. Indeed, no-one before Vidal showed more clearly the composite nature of environments in which many dissimilar beings adapted themselves to a common existence. This, certainly, is ecology, but it is ecology on a vast scale and of an immense complexity, ranging

[8] Paul Vidal de la Blache, 'La géographie humaine, ses rapports avec la géographie de la vie', in Revue de Synthese Historique, VII-2, (1903): 219-240.

from geological history to the tilling and the manufacturing of man. In its enormous scope, in its global inclusiveness allied with sensitive observations of local environments, the golden age of human geography offers guidance for architects interested not only in the necessarily detailed, man-made nature of their work, but also in the laws that lay behind it.

It points to an approach that is at once sensitive to the forms of the earth – to its artistry - and informed by the sciences of nature. It proposes a view of the world in which human activities are integrated with the systems of ecology, making ecosystems - the small worlds of ecology - not so much perfect as subject to human maintenance, transformation and improvement. From this perspective, it becomes clear that architects can play a significant role in the politics of ecology, so long as they refrain from making apologies for design (in the way some ecologists make apologies for human presence) and find their voice to speak out on matters that are central to their vocation. Indeed, which discipline but architecture, with its combination of knowledge, imagination and practice, could be better placed to envision viable compacts between humans and nature?

12 July 2010