

PERMACULTURE

Permaculture, a theory developed by Mollinson, like Gaia theory, has for its starting point life and the world of nature: also like Gaia theory it, too, is a useful tool for an examination of the design of sustainable organic urban forms. Permaculture, which is short for permanent agriculture, is ‘...the conscious design and maintenance of agriculturally productive ecosystems which have diversity, stability and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non material goods in a sustainable way’. For a case study in permaculture, see *Urban Design: Method and Techniques* (Moughtin *et al.*, 2003a, pages 111 to 114)

CONCLUSION

The Gaia thesis and Mollinson’s permaculture emphasize both the complexity and delicacy of the ecosystems in which human beings live and breathe. In contrast to this holistic approach, the compact city attacks mainly one set of a whole host of interrelated problems associated with achieving a sustainable settlement pattern. Certainly the compact city and ‘densification’ of development can achieve reductions in the use of fossil fuels for transport and town heating, reductions too in the use of land and in the cost of urban infrastructure. But from an organic model of the city perhaps we should expect more than the compact city can deliver.

The organic city in general has an optimum size: the city is born and, like organisms, comes to maturity, then persists if healthy. In the past cities have died but, unlike organisms, have been resurrected on the same site. City health is maintained according to the organic model only as long as the balance of its components is maintained. Excess growth is managed by the propagation of new colonies, but only where new or underused land exists. The organic model for the city is most in tune with the concept of sustainable development when, in particular, it takes on the attributes of nature’s ecosystem. Sustainable human settlement occurs where there is a state of ecological balance, however temporary, between human activities and the supporting environment. That is where there is diversity in the total components in the human–nature ecosystem that maintains the delicate balance between energy inputs and outputs and where recycling and the environment are able to absorb residual waste and pollution. According to this model of the city, decay is apparent in settlements when this delicate balance breaks down and excessive growth occurs or when self-healing ceases; the result can be likened to cancer, uncontrolled growth, or obesity.

In developing a normative theory for the sustainable city the metaphor of the city as an organism has a clear advantage over both the concept of the eternal city of the gods, the microcosm of the universe and also the idea of the clockwork city of honest industry. The main contribution of organic theory is its holistic view of the city as a part of nature. The organic city is not set in an idealized but remote cosmos, nor is it limited to the pursuit of the technological control of the environment. Sustainable development and organic city theory share the fundamental

goal of conceptualizing settlement as a whole: the elements or parts of the city are not strictly separate but supportive. The organic city has the delight, diversity and subtlety of the natural world: indeed it is part of nature.

In both sustainable city theory and organic theory, process and form are one. While the process of city structuring results in the form, the form is apparent from the beginning: the pattern, as Alexander *et al.* (1987) suggest, is in the seed, at the point of origin. The growth of any acorn results in an oak tree, and while each tree is composed of similar elements linked in specific ways, no two trees are identical. So too with the sustainable city, the pattern is established by the principles used for the design and linkage of the parts. The design of the parts and the nature of their linkages will form the content of later chapters. Certain forms, however, are associated with and act as symbols for the organic city, the most obvious being the green areas of open landscape within and around cities. Other forms associated with the organic city are buildings which appear to be grounded in the earth or to be a part of the environment through the use of traditional materials and local forms in harmony with the landscape. Other more romantic ideals associated with the organic model include the thatched cottage, the ivy clad wall, the herbaceous border, the orchard and the walled garden. The urban structure of the organic city is non-geometrical: roads follow a curving path while spaces in the city are picturesque and in the manner of Sitte's ideal. In terms of the overall structure, the pattern of the organic city has an edge or zone of transition between town and country, a 'fleshy' edge between strictly urban activities and those of the surrounding countryside with its environmental support

services. Like all boundaries, however, the city edge is a product of the mind. It also has a centre and clearly recognised parts, districts or neighbourhoods. These symbols of the organic city appear to be useful concepts for the purpose of discussing the possible form of the sustainable city of the future. They may form the basis from which to develop a design tradition for the sustainable city.

The organic metaphor has certain limitations. The city is not a tree (Alexander, 1965). Cities do not grow, reproduce and heal themselves: the agent for their change is man. Describing a city in terms of its heart, lungs or arteries does not help in the analysis of the problems of city centre decline, pollution and gridlock on city streets. Such terms for the parts of a city based on human and animal anatomy, however, may have value in suggesting ideas for problem solutions through analogy (de Bono, 1977; Gordon, 1961). For analytical purposes the most fruitful metaphor from nature is the ecosystem – that is, a relatively stable arrangement of flora and fauna delicately balanced with other elements of the environment. The relationship or nature of the connection between the components of the ecosystem can be analysed and modelled. The effect, therefore, can be estimated of changes to any components in the system. McLaughlin (1969) and Chadwick (1966) and others forty years ago, were advocating this method for planning. Systemic thinking is probably the conceptual framework which is essential for the analysis of urban processes of great complexity. Tools such as GIS (Geographic Systems Analysis) are available to facilitate this complex analysis (for a case study, see Moughtin *et al.*, 2003a).

The premise for this book and the others in this series is that the form and