

endanger the world. They advocate a steady state or preferably a decline in population and an economic slow down.

The organic model of the city is most in tune with the concept of sustainable development, particularly when it takes on the attributes of the ecosystem. The analogy for the optimum stage in city development is the ecological climax, that is, where there is a sufficient diversity in its components to maintain a balance between the energy inputs and outputs. The optimum or balanced stage of city development reduces pollution and waste production through processes of recycling. In simplistic terms the city deals with its own dirty washing. Decay, according to the organic model of the city, is apparent in settlements where the delicate balance of its components breaks down, excessive growth occurs and where self-healing ceases. The result can be likened to cancer or uncontrolled growth. Sustainable development and organic city theory both conceptualize the settlement as a whole, and both develop within a holistic paradigm where the elements or parts of the city are not strictly separate but supportive. The organic city as an idea has the delight, diversity and subtlety of the natural world. It is, indeed, a part of nature.

An understanding of man's settlement pattern and its relationship with the larger world of nature is illuminated by the work of Lovelock and his Gaian theory.⁸ Gaian theory has, as its premise, the idea that the Earth is a superorganism which is actively self-regulating. Lovelock rejects the notion that the Earth seen as a self-regulating organism is necessarily a teleological concept. He maintains that a self-regulating superorganism, such as his concept of Gaia, does not require a biota with both foresight and skills in planning. To investigate and dismiss this particular criticism of his Gaia hypothesis as teleological, Lovelock invented Daisyworld. Daisyworld is a simplified model of our planet consisting only of a flora of different coloured daisies. Lovelock showed mathematically how the living plants could adjust the proportions of the various coloured varieties, so

changing the planet's conditions, to maintain a life-supporting environment suited to the plants' requirements. Life on this planet is a paradoxical contradiction to the second law of thermodynamics which states that everything has been, is, and always will be, running down to equilibrium and death. It is rather like a wound clock spring, which slowly unwinds until the clock stops. Natural processes always move towards an increase of disorder, measured by entropy, a quantity that inexorably increases. The normal expectancy for a planet like Earth is an inert, lifeless mass such as Venus or Mars. Lovelock illustrates the paradox of life on Earth in this way: 'Yet life is characterised by an omnipresence of improbability that would make winning a sweepstake every day for a year seem trivial by comparison. Even more remarkable this unstable, this apparently illegal, state of life has persisted on Earth for a sizeable fraction of the age of the Universe. In no way does life violate the second law, it has evolved with the Earth as a tightly coupled system so as to favour survival'.⁹

Permaculture, a theory developed by Mollinson, like Gaia theory, has for its starting point life and the world of nature: like Gaia theory it, too, is a useful tool for the design of sustainable urban forms.¹⁰ Both theories are essential reading for the Urban Designer as we approach the new millennium. They provide the core of the ethics and philosophy of sustainable development. 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 needs in a sustainable way'.¹¹ Permaculture parallels Lovelock's notion that the Earth is an information process which is self-regulating, self-constructed and reactive system, creating and preserving the conditions that make life possible. This system actively adjusts to regulate disturbances. Mollinson attempts to build a