

AWASH in a flood of literature describing crises, we seem to know all too much about acid rain, the greenhouse effect, ozone depletion and tropical deforestation. But we don't seem to know enough about effective solutions to these problems (ozone-friendly aerosols and lead-free petrol notwithstanding). This leaves even committed environmentalists feeling punchdrunk and powerless. Bill Mollison proposes an antidote to environmental malaise in *Permaculture: A Designers' Manual*, challenging readers to design creative alternatives into their own lives. He says, "If we do not get our cities, homes and gardens in order, so that they feed and shelter us, we must lay waste to all other natural systems. Thus, truly responsible conservationists have gardens which support their food needs, and are working to reduce their own energy needs . . ."

From this premise grows the text of a remarkable reference manual of 580 pages that shows how we can design human settlements ethically and regenerate degraded environments, using nature's flows to extract our food, energy and shelter. "Permaculture" uses carefully maintained and designed ecosystems to produce sustainable yields to meet society's material and non-material needs. Its philosophy is one of working with rather than against nature, "looking at systems in all of their functions" and "allowing them to demonstrate their own evolutions". Mollison cites relevant

Right by design

Permaculture: A Designers' Manual
by Bill Mollison, *Tagan Publications**, pp 576,

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design lessons learnt from sources as diverse as traditional Aborigines, modern crop scientists and burrowing mammals. His examples range from integrated land management in traditional Hawaii, organic greenhouse ventures in New York slums and desert polycultures in North Africa, to energy-efficient homes built in caverns in the Canary Islands.

A practical positivist who believes, "in chaos lies unparalleled opportunity for imposing creative order", Mollison thinks that possibilities for productive, sustainable use of land are as unlimited as the human imagination. Any piece of land has intrinsic "natural elements, forces, pressures, processes, agencies, and evolutions" that we can use to our advantage. It is up to the designer to integrate the needs of the house with the needs and outputs of the garden, the glasshouse, the orchard, the wood lot, crop land, the pasture and the pond. Thus, you can use chickens and ducks to rid orchards of insect pests, arrange trees and crops to benefit each other in symbiotic guilds or build swales (small retaining walls) to make the most use of rain in dry climates. The book is unique in that it stresses design-based solutions rather than device

solutions, coaxing would-be permaculturists to think about patterns, shapes and flows in the planning stages.

Mollison develops the idea of permaculture fully in the first four chapters, explaining its underlying philosophy and concepts, and their implications to the design of management of ecosystems, energy, water and microclimates. Chapters five to nine identify factors in design, including climate, trees, water, soil and earth-working. The last six chapters apply these principles to specific situations in the humid tropics, drylands, temperate areas and wetlands. The strong chapters on drylands, humid tropics and aquaculture reveal Mollison's practical experience and commitment to effective long-term use of the land. He stresses that future farmers should see themselves as foresters, and that trees must be considered as tools for stabilising land.

Development of sustainable strategies for the management of drylands, says Mollison, is one of the most urgent global needs. He gives a detailed analysis of the features and types of desert land. He suggests how people can divert and manage water effectively with each type. He is quick to cite traditional solutions, such as the use of quanats, a species of

tree with deepgrowing taproots, to tap aquifers in Iran or the agricultural use of floodwater dams with earth walls by Papago Indians in Sonora. He does not allow this to limit strategies. Modern tools enable more effective solutions; bulldozers and concrete greatly enhance the techniques for harvesting water. Soil and water testing enable desert farmers to prescribe the best fertilisers for their land. Scientific progress has also opened many options for irrigation.

The layout by Andrew Jeeves is informative, attractive and simple: his drawings express concisely points sometimes belaboured in the text. I found myself paging through the book just to take in the artwork.

Concerned practitioners developing whole units of land for shelter and agriculture should read this book. It is a stockpile of ideas for those wishing to rehabilitate degraded sites, and for rural workers in both developing and developed countries. Backyard landscapers can also apply many of the permaculture methods to their homes and gardens. Although it is not strictly a scientific treatise (there are a few minor inconsistencies), the book is a philosophical milestone of a movement that has come of age. It is also a pragmatic book for field workers who thrive with dirt under their fingernails. □

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