

Book Reviews

Chicken with vegetables to go

by Kay Barnes

Chicken Tractor

by Andy Lee

Good Earth Publications, 1994, \$19.95 paper.

Chicken Tractor is backyard chicken raising with a new twist, including advocating the humane treatment of poultry and all livestock - a permaculture hallmark. The text, replete with graphs, diagrams, and tables of informative data, gives guidance in combining past methods of poultry raising with today's intensive gardening techniques.

Lee, a permaculture instructor in market gardening and biointensive gardening techniques at the University of Vermont, has contributed his knowledge in articles to major gardening and news journal magazines.

Animals tractors in permaculture design are a tool for placing every element in relationship to others so that they assist and support each other. As Mollison put it "It is how the human, the chicken and the garden are connected."

The idea behind the chicken tractor is to avoid contamination by a chicken house that stays in the same place year after year: cumulation of potentially toxic manure, odours, rats and mice attracted to fallen food, lack of availability of fresh greens, dust, dirt, and flies.

The chapter titled "Recipe for a Chicken Tractor" tells exactly how to build the simple shelter, which is applicable for almost any breed of poultry and other small livestock. Simple tunnels from the fixed henhouse to the tractors cleverly allow chickens to move themselves to the lightweight coops. From there they can easily be set on the garden beds, where they function as tillers and fertility cyclers - thus the name, "chicken tractors." And then there is the chicken tractor, moving with beef cattle on range. "Pastured poultry" is a distinct and definite money-maker.

The results are that chickens clean your garden beds by eating grass, weeds, weed-seeds, bugs, and plant debris; they incorporate residues by scratching the ground (tilling); and they add valuable fertilizer. This system nearly eliminates flies and smells.

The chicken in the tractor becomes a biomass recycler; the manure then returns to the earth as fertilizer for following crops. The eggs and meat nourish the gardener, while the viscera, feathers and carcass add tremendous value to compost heaps.

The book offers much detail on the types, care, and uses of chickens, and on their functions and environments, good and bad. Soils are discussed in detail as well as how to develop "super-rich" soil with animal manure. An appendix concludes with a several page listing of recommended books for small scale agriculturalists, and associations to join.

The chicken tractor approach fits the small flock grower and hobbyist very well and provides habitat for endangered poultry breeds. These breeds possess the very traits needed for the chickens to thrive out of doors. They should be considered superior to commercial hybrids for your garden. A useful chart offers data on endangered breeds of poultry and information on how to get involved in livestock conservation.

The author states he has tried to contain all the philosophical, environmental, and humane background, combined with the practical, everything-you-need-to-know information to get started with a chicken tractor in your garden in the "little book."

A chicken tractor is simple to build and its rewards are many:

- It's a system that solves several problems in the conventional raising of poultry.
- Appropriately scaled and practical, it can be used for as few as one chicken or as many as the grower can handle.
- It's a way to get good nutritious food inexpensively.
- It prepares the soil for optimal yields of vegetables and small fruits.
- It encourages self-reliance for the grower.
- It enables market gardeners and small-scale family farms to expand their menu and enhance profitability.
- It is a humane way to raise poultry.
- It will stimulate interest in the heritage poultry breeds that are good foragers.
- Potentially, chicken tractors can have a positive global impact on how people reclaim land and produce their food, and will encourage local self-sufficiency.

Reading this delightful, unique and informative book, one can easily see where chicken tractors bring into play the harmonious relationships between (you) the gardener, the chickens, and the garden.

Modelling Nature: A Permaculture Family Tree

by John Todd

Dynamic Aquaria: Living Ecosystems

by Walter Adey and Karen Lowland

Academic Press, 1991, Cloth \$39.95.

In 1971, the ecologist H.T. Odum, in his seminal book, *Energy, Power, and Society*, proposed an extraordinary new direction for human societies. He suggested that it was now theoretically possible to develop human support systems founded on the workings of natural ecosystems. Dubbed "ecological engineering," his ideas have since come of age in numerous applications including those found in the book, *Dynamic Aquaria: Living Ecosystems*.

Branches of growth

Odum's seminal idea generated quickly, and in just two decades has given rise to five distinct branches. The first of these grew out of design considerations for the exploration of space, as Bill Wolverton at the NASA laboratories began to develop waste recycling systems and plant-based communities for maintaining air quality in confined spaces.

The second branch consists of a broad-based group of ecological engineers from Europe, the Far East, and North America who are developing "natural" alternatives, especially created marshes, to purify sewage and other wastes.

The third branch of the tree deals with the means to grow luxury foods in hostile or arid environments. Its primary exponent was Carl Hodges, of the University of Arizona, who built the "contained ecosystems" for food culture in Saudi Arabia and on the shores of the Gulf of California in Mexico. In subsequent years, he and his associates incorporated salt-tolerant plants into their artificial systems. Most recently, the designers of the Biosphere 2 experiment in Arizona have used this knowledge to design their food-producing zones.

The fourth branch is the one with which I am associated. Beginning in 1971, William McLarney and I created the first Living Machine for the culture of foods in a small, solar-heated environment. Out of this work at the New Alchemy Institute, and other work during the 1980s and 1990s here at Ocean Arks International, we began to develop the theoretical foundations for Living Machines that could be used to culture foods, treat wastes, heat and cool buildings, generate fuels, and integrate architecture with ecosystems for mutual benefit.

Civilized wilderness

The fifth branch of the seed Odum planted is the subject of this review. Essentially, this branch involves the re-creation of wild systems in a domestic environment. Its chief exponent is Walter Adey of the Smithsonian Institution. For almost two decades, he has been brilliantly crafting model ecosystems of mangroves, coral reefs, and other marine, brackish, and freshwater systems. He has also developed ecologically engineered and photo-synthetically-based subsystems called "algal scrubbers" to support and internally regulate his model ecosystems. Adey is a stickler for bringing all the forces impinging upon the wild system into his models. For example, he once told me that he considered lightning a determinant in the ecology of mangroves and that the equivalent electrical charges might be necessary for the artificial systems in order for them to function optimally over time.

Dynamic Aquaria, by Walter Adey and Karen Loveland, is a tour de force from this latter perspective. It is remarkably thorough in its treatment, in part because it is based upon systems that have actually been built at the Smithsonian and elsewhere.

Part One of the book provides insights into creating physical environments for model systems, and includes sections on water quality as well as normally overlooked components, such as waves and tidal motions. The second part of the book is an excellent overview of the biochemical environment. Any person interested in the dynamics of living systems will gain from reading this section. In Part Three, the authors examine the biological structure of model ecosystems. This may be the best description of biological organization and design in the existing literature. It alone is worth the price of the book.

World in Miniature

In Part Four, Adey and Loveland describe the development of specific models, including a coral reef ecosystem, a Maine coast microcosm, and estuary systems including Chesapeake Bay and the Florida Everglades. They also characterize a variety of freshwater model ecosystems, including a fascinating 265 litre (70 gallon) "African" pond model developed to accommodate fishes native to that continent. The final section of the book is a summary of the basic principles involved in ecological engineering. It is also a call to begin experimenting with model systems on any scale within one's means, since models can be built even on zero budgets. Rightly, Adey and Loveland suggest that even the

simplest of systems can reveal the dynamics, wonder, and mystery that reside in the natural world.

Multiple Lessons

This is the kind of book that all restoration ecologists should read, no matter what their field of interest. It not only provides insights into how ecosystems work, but also brilliantly illustrates the value of constructing ecosystems as a means of raising questions and testing ideas. What Adey, Loveland and their colleges are doing is not dissimilar to what restorationists do on a larger scale under field conditions: assemble ecosystems. Only they are building models that can be easily pulled apart when a system doesn't work. In this way, model builders gain insights, often unexpected and counter-intuitive, into the structure and functions of ecosystems.

The accounts of ecosystem model building in this superb book should encourage restorationists, both professional and non-professional, to seize upon the value of their own ecosystem construction work as a way of raising questions and testing ideas as they repair the health of badly degraded environments.

John Todd, founder of New Alchemy Institute, and co-author, with Nancy Jack Todd, of Bioshelters, Ocean Arks, City Farming: Ecology as the Basis of Design, works with Ocean Arks International, One Locust Street, Falmouth MA 02540. This review appeared originally in Restoration & Management Notes, 10:2 Winter 1992, available by subscription from University of Wisconsin Press-Journals, 114 N. Murray St., Madison WI 53715-1137.

Seeing the forest...

Restoration Forestry

An international Guide to Sustainable Forestry Practices

by Michael Pilarski

1994, \$26.95 illust., paperback.

Restoration Forestry is the most comprehensive.....

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