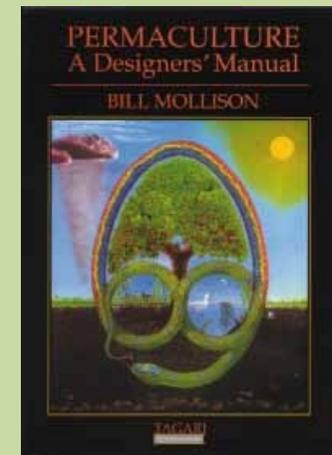
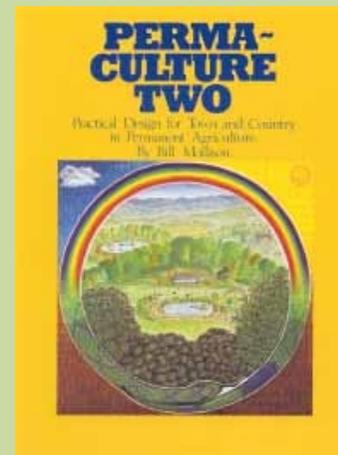
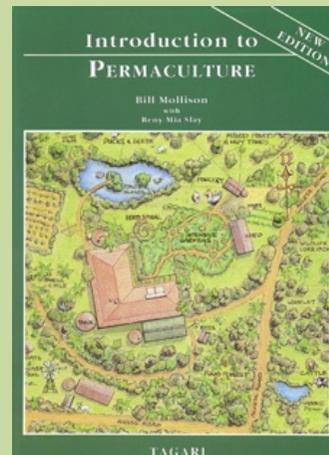


Permaculture

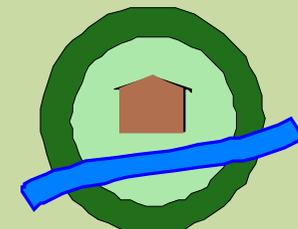
Permaculture (permanent agriculture) is the conscious design and maintenance of agriculturally productive ecosystems which have the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non-material needs in a sustainable way. Without permanent agriculture there is no possibility of a stable social order. (Bill Mollison).



Presentation by
Ezio Gori ("Buzz")
Project Management &
Sustainable Development Consultants

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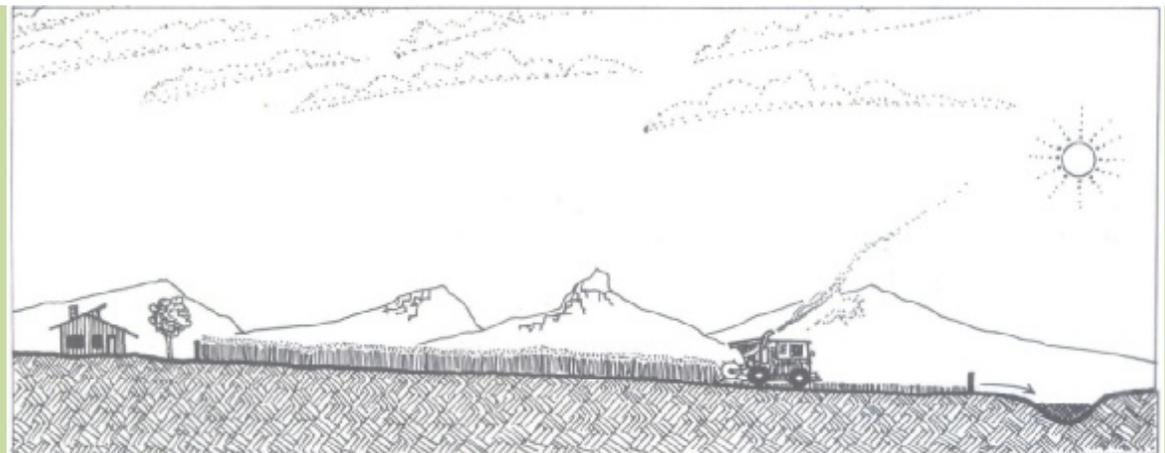
Evolution from Contemporary Agriculture to a Permanent form of Agriculture, hence Permaculture

A 3 to 8 year Transition Period to change over from Contemporary Agriculture to Permaculture.

Basic changes involve:

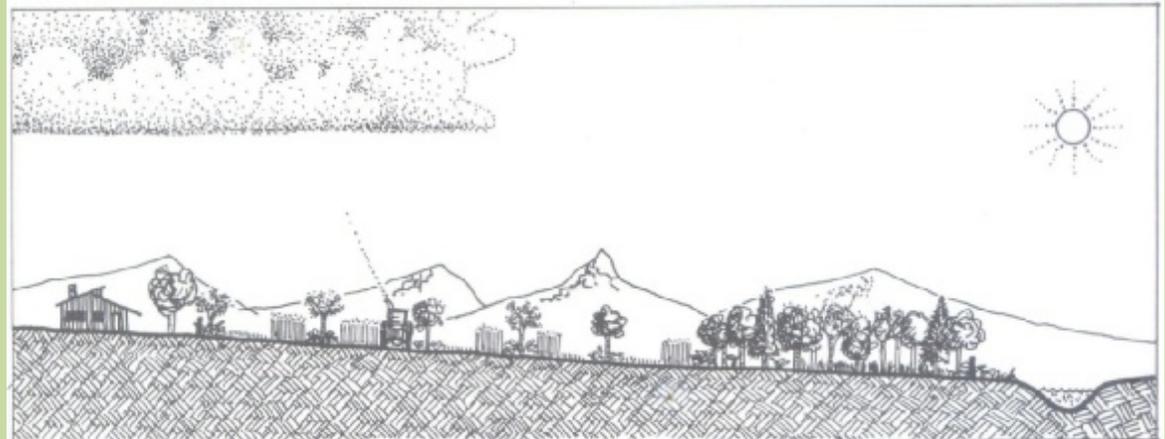
- replacing animal forage grains with tree crops
- increasing forest cover
- adopting low to no tillage on remaining croplands
- retrofitting the house for energy conservation
- producing some (if not all) fuel on the farm.

Bill Mollison, Permaculture:
A Designer's Manual,



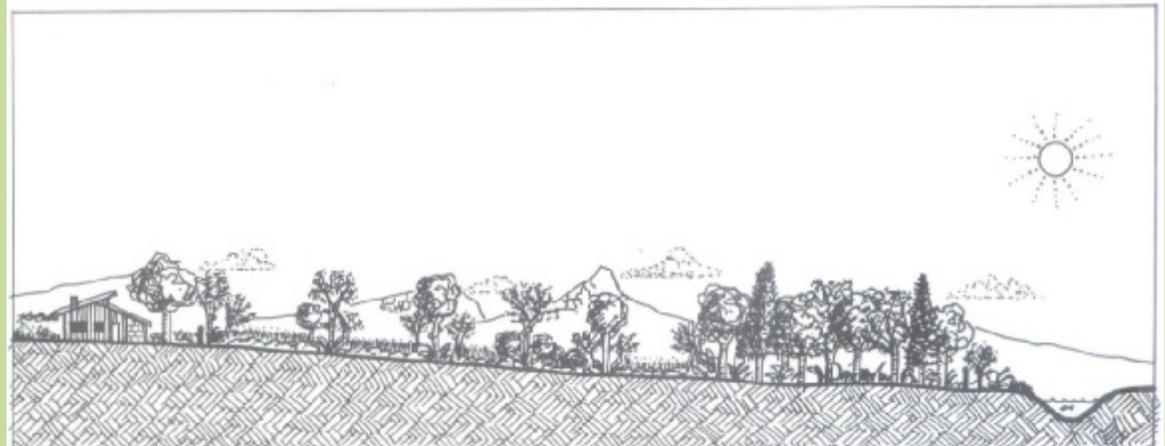
A. CONTEMPORARY/WESTERN AGRICULTURE

YEAR 1



B. TRANSITIONAL AND CONSERVATION FARMING

YEAR 4



C. PERMACULTURE; 70% cropland devoted to forage farming

YEAR 8

Evolution from Contemporary Agriculture to a Permanent form of Agriculture, hence Permaculture

Annotations to the bar graph:
Accounting the costs of farming

1. Cash Accounting:

Bar 1: Income from total product on the farm.

Bar 2: Cost of producing that income in real terms (including subsidies).

2. Energy Accounting:

Bar 3: Electricity, oil, fertilizers, pesticides, firewood, etc.

Bar 4: Energy produced, eg. Firewood, food calories.

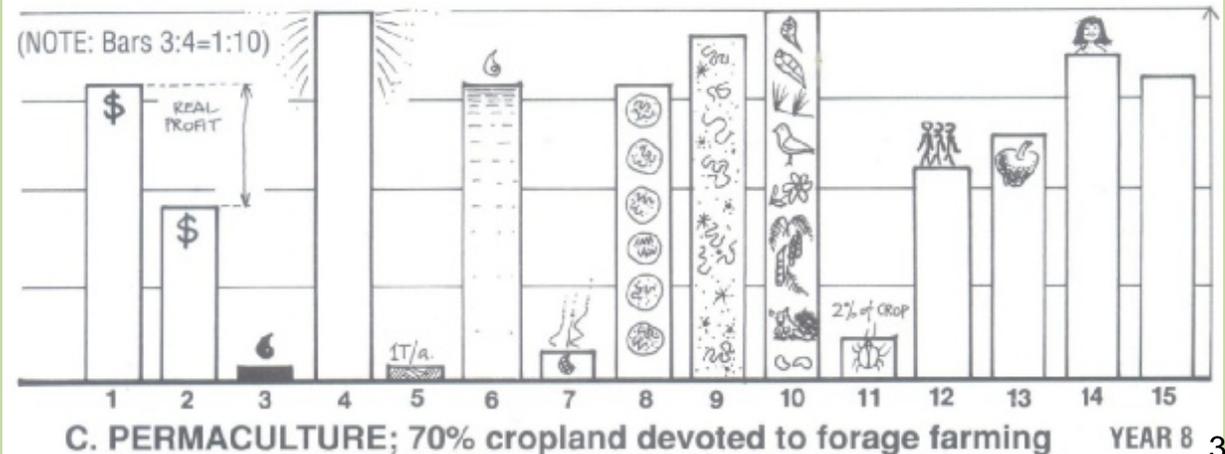
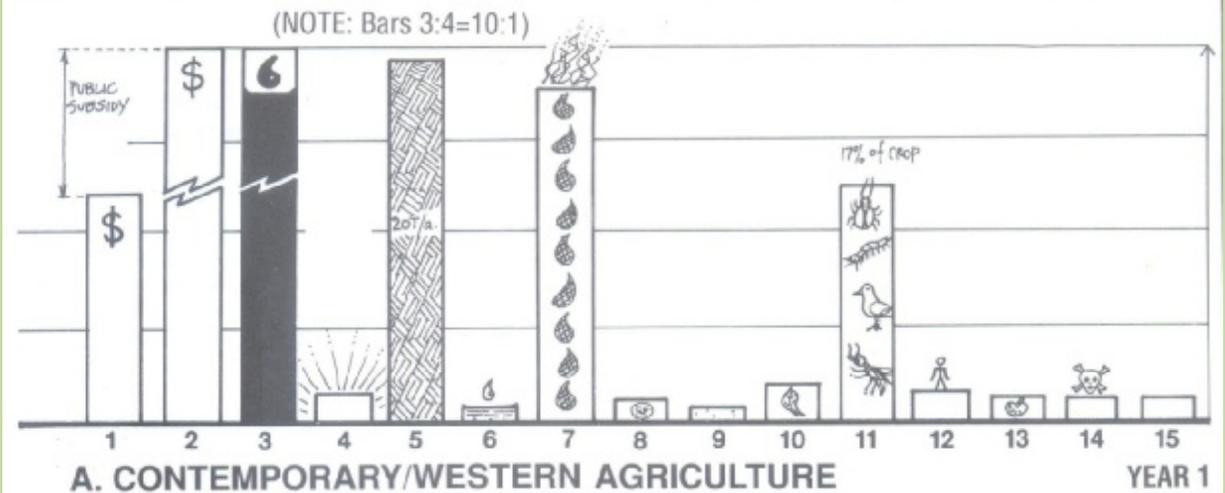
3. Environmental Accounting:

Bar 5: Soil loss, includes loss of humus and mineral nutrient loss.

Bar 6: Efficiency of water use and soil water storage.

Bar 7: Pollution produced.

Bill Mollison, Permaculture:
A Designer's Manual,



Evolution from Contemporary Agriculture to a Permanent form of Agriculture, hence Permaculture

Annotations to the bar graph:
Accounting the costs of farming

4. Conservation Accounting:

Bar 8: Genetic richness in crops and livestock.

Bar 9: Soil life (biomass).

Bar 10: Forest biomass and wildlife richness.

Bar 11: Loss to pests.

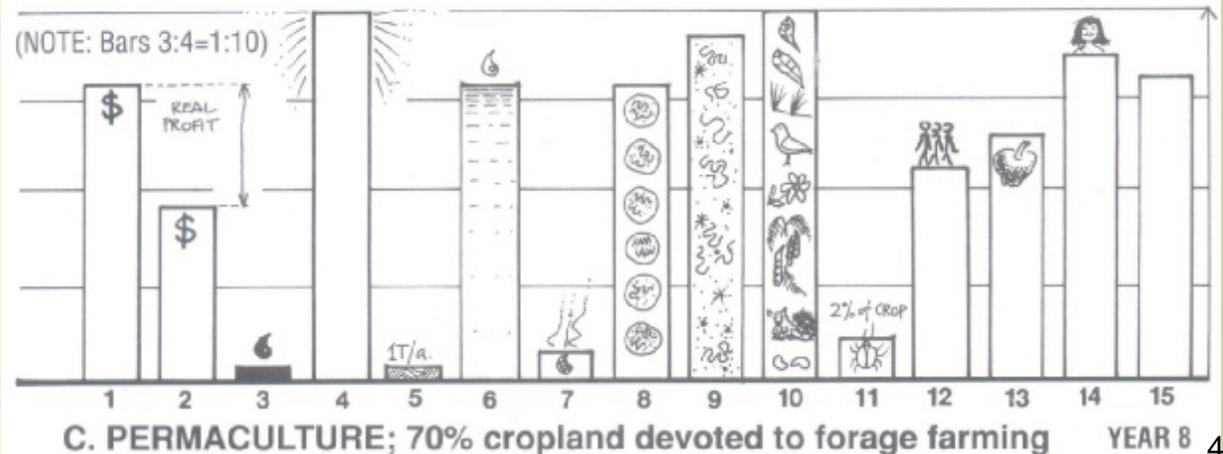
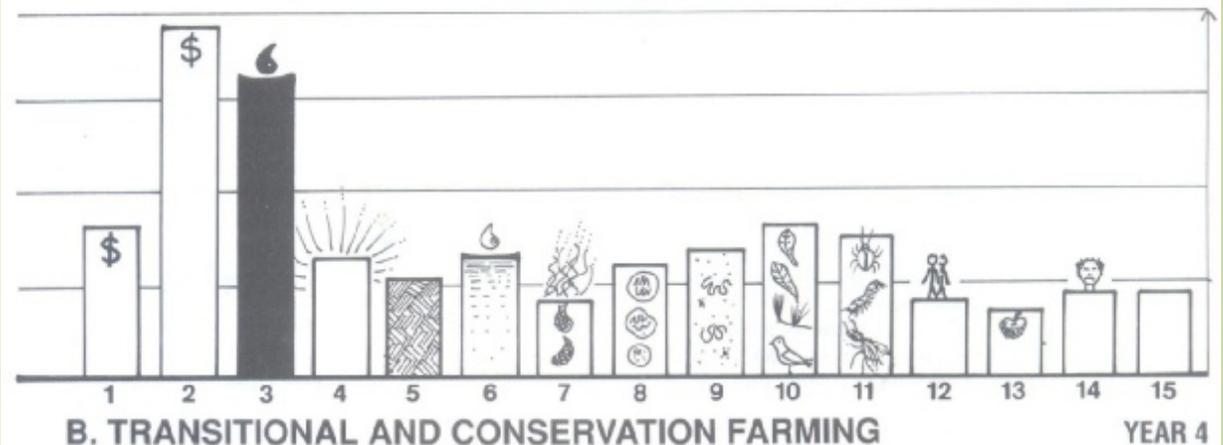
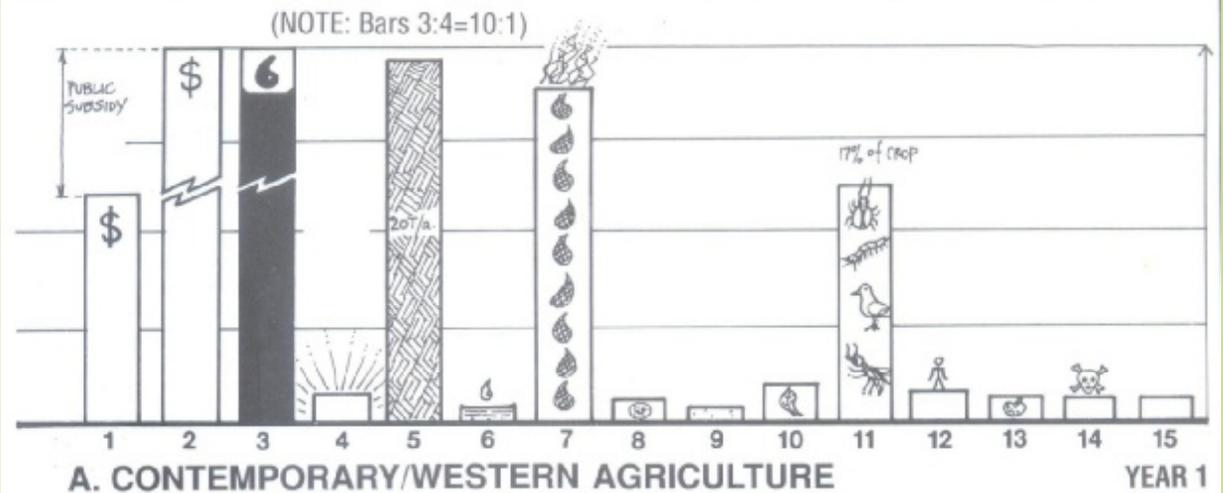
5. Social Accounting:

Bar 12: Employment on farm.

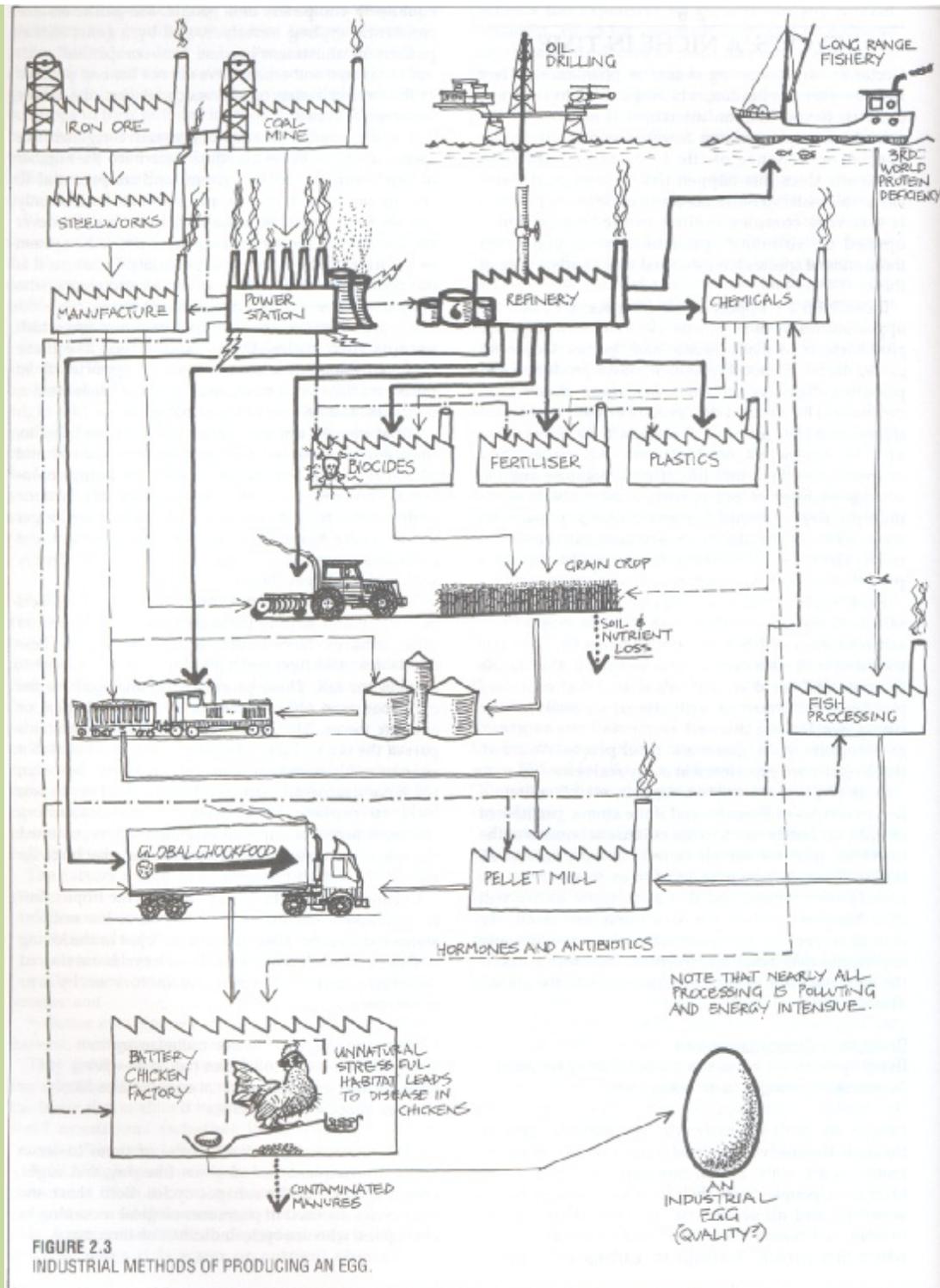
Bar 13: Food quality produced.

Bar 14: Human and environmental health.

Bar 15: Life quality as "right livelihood".



The story of an Industrial Egg



The story of a Permaculture Egg

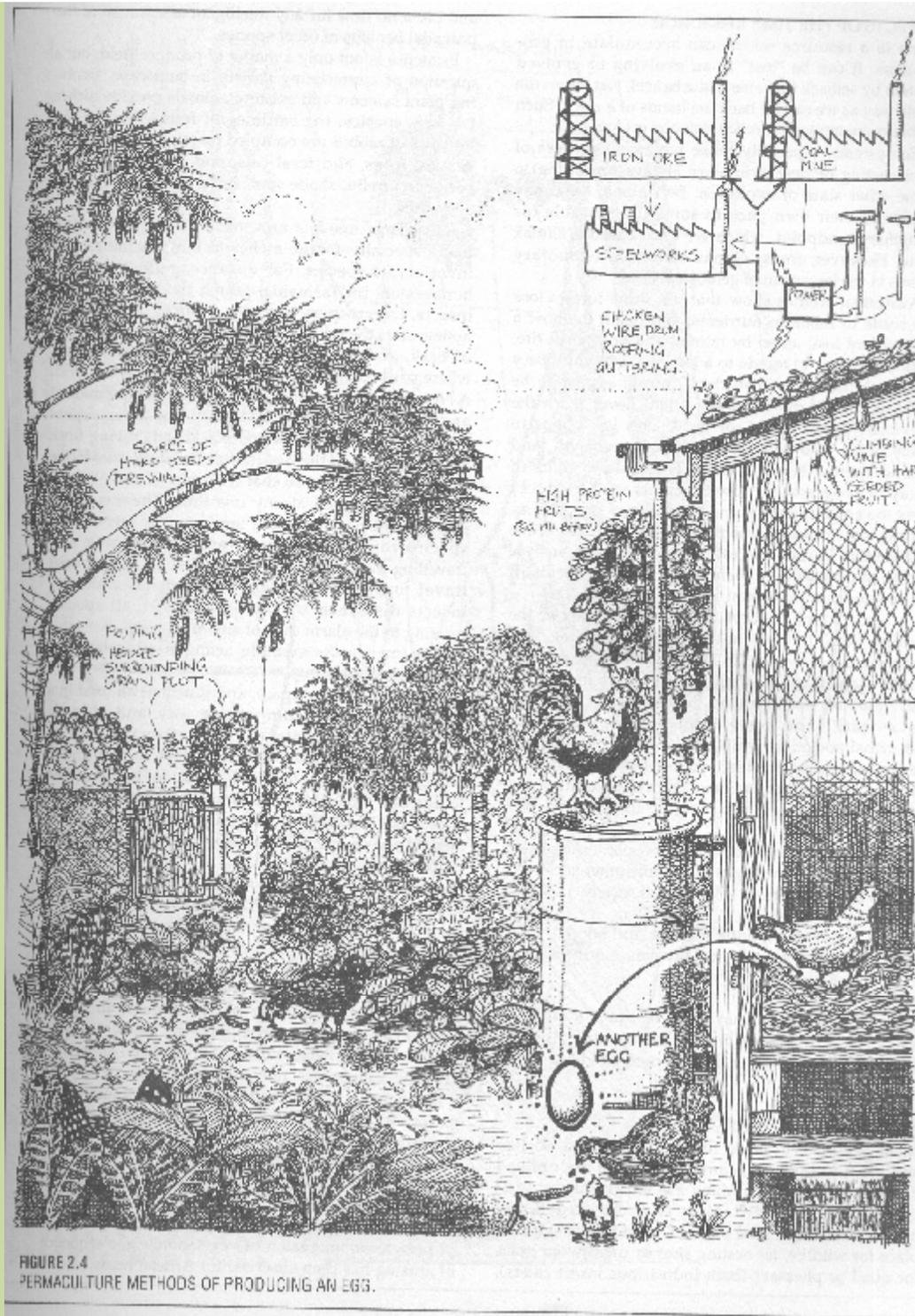


FIGURE 2.4
PERMACULTURE METHODS OF PRODUCING AN EGG.

Bill Mollison, Permaculture:
A Designer's Manual,

Foundations of Permaculture Design



Earthcare

Care of all living things, animals, plants, water, land and air.

Permaculture as a design system is based on natural systems. It is about working with nature, not against it – not using natural resources unnecessarily or at a rate at which they cannot be replaced. It also means using outputs from one system as inputs for another (vegetable peelings as compost, for example), and so minimising wastage.

Peoplecare

Providing for people's basic needs, and, promoting self reliance and responsibility.

People care is about looking after us as people, not just the world we live in. It works on both an individual and a community level. Self-reliance, co-operation and support of each other should be encouraged. It is, however, important to look after ourselves on an individual level too. Our skills are of no use to anyone if we are too tired to do anything useful! People care is also about our legacy to future generations.

Fairshares

Living within ones means and distribution of surplus resources and skills to achieve Earthcare and Peoplecare.

The fair shares part of the permaculture ethic brings earth care and people care together. We only have one earth, and we have to share it - with each other, with other living things, and with future generations. This means limiting our consumption, especially of natural resources, and working for everyone to have access to the fundamental needs of life - clean water, clean air, food, shelter, meaningful employment, and social contact.

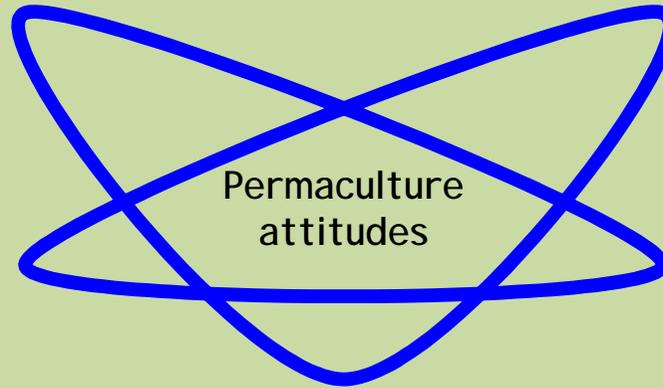
Work with nature not against

"Life is cooperative rather than competitive, and life forms of very different qualities may interact beneficially with one another and with their physical environment."

"(Permaculture) is a philosophy of working with rather than against nature; of protracted and thoughtful observation rather than protracted and thoughtless action.."

Everything gardens

Everything living thing 'gardens' or modifies it's environment



Unlimited yield

Traditionally, 'yield' is thought of as quantity of material output (eg, amounts of potatoes, grain, etc) calculated against resources or effort put in, but there's no reason why we can't widen our definition to include information, lessons learned, experience, the health benefits of exercise and being outdoors, or even just plain fun... Within a permaculture design, we will constantly be finding new niches to utilise, new beneficial [guilds](#), learning new techniques, trying out fresh ideas, be gathering knowledge. By comprehending and copying natural systems, we can develop techniques in order to consciously multiply such opportunities...

The problem is the solution

It is how we look at things that makes them advantageous or not, or, as Bill Mollison once said, "You havn't got an excess of slugs, you've got a duck deficiency".

Minimum effort for maximum effect

For example, when choosing a dam site, select the area where you get the most water for the least amount of earth moved.

Bill Mollison, Permaculture: A Designer's Manual,

Permaculture Design Principles

Energy Efficient Planning

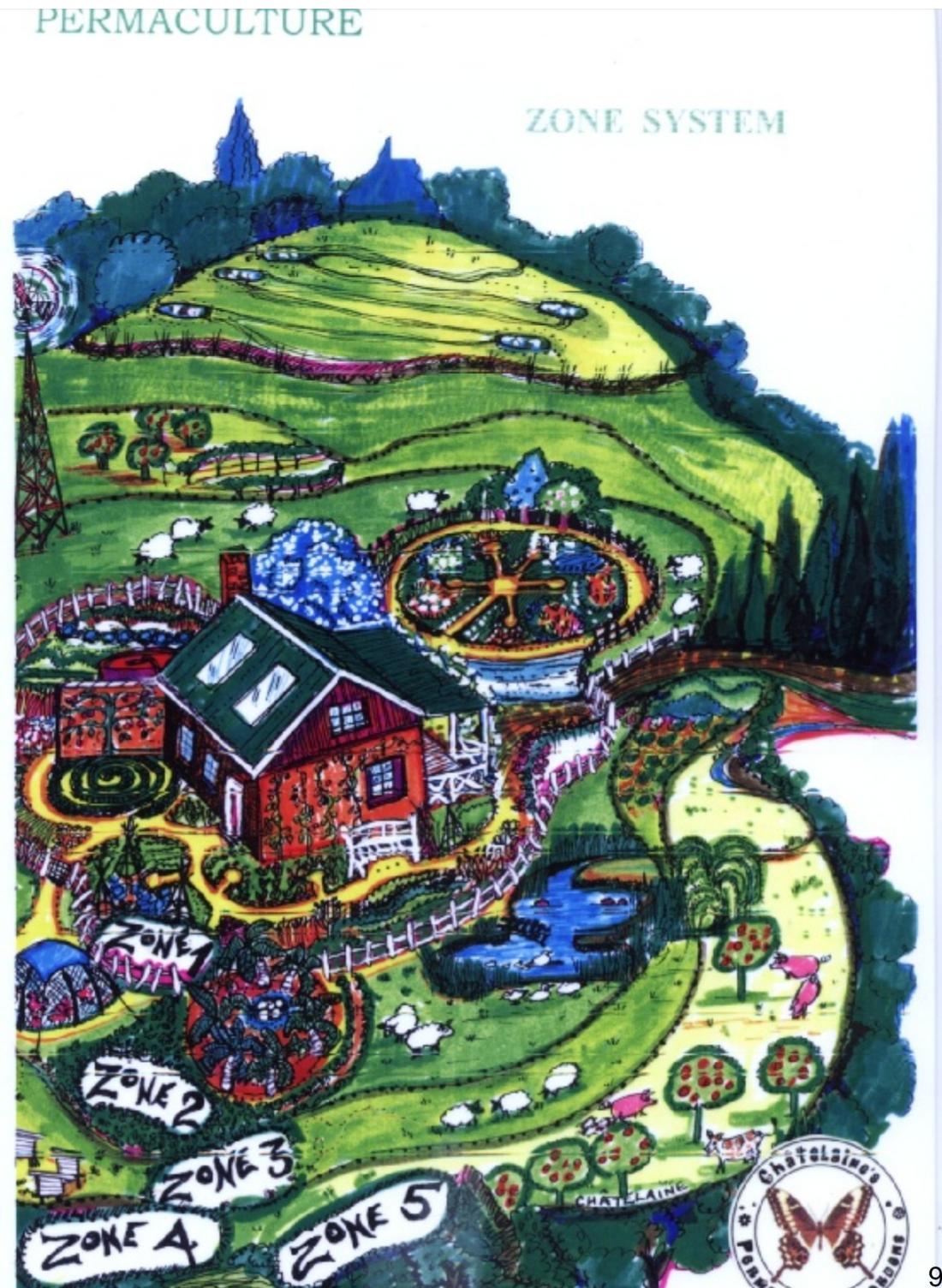
- Zone planning
- Elevation planning
- Sector planning

Resource Planning

- Multiple function
- Natural energy
- Biological resource

Design Planning

- Relative location
- Microclimate
- Maximise edge
- Succession
- Diversity
- Pattern



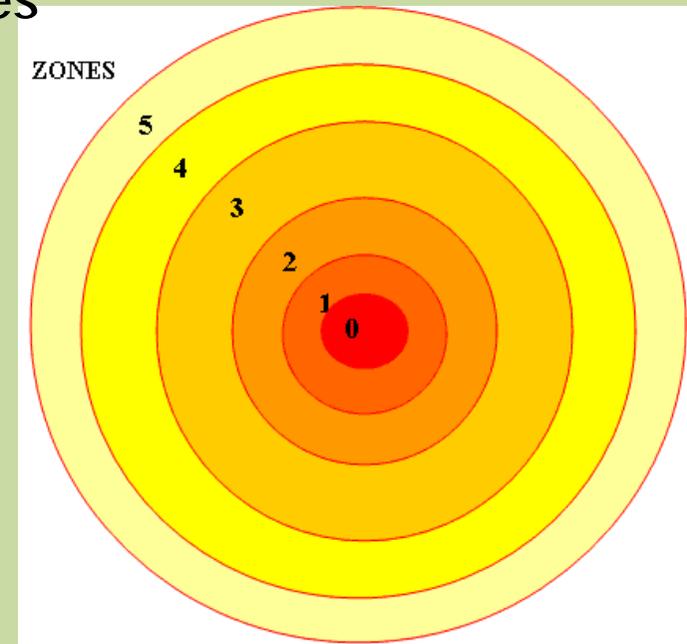
Energy Efficient Planning

Zone planning

Elevation planning

Sector planning

Permaculture Design Principles



Zone One: The Home Garden

- Regular daily visits.
- Within 6 meters or so of the house, in Zone 1, should be placed those elements that require close observation, frequent visiting, high work input or continual complex techniques.
- The aim of Zone 1 is to yield household self-sufficiency and climate control for the home. Zone 1 is also the first Zone that should be developed on your site.
- And so, elements such as rainwater tanks, the lemon tree, other dwarf or espalier-grown multi-graft fruit trees, chicken laying boxes, small ponds, culinary herbs, worm farm for recycling of household wastes, intensive, fully mulched vegetable beds of quick growing annuals, seedling raising areas, and small, quiet domestic animals like fish, rabbits and pigeons can be kept very close at hand within the home garden.

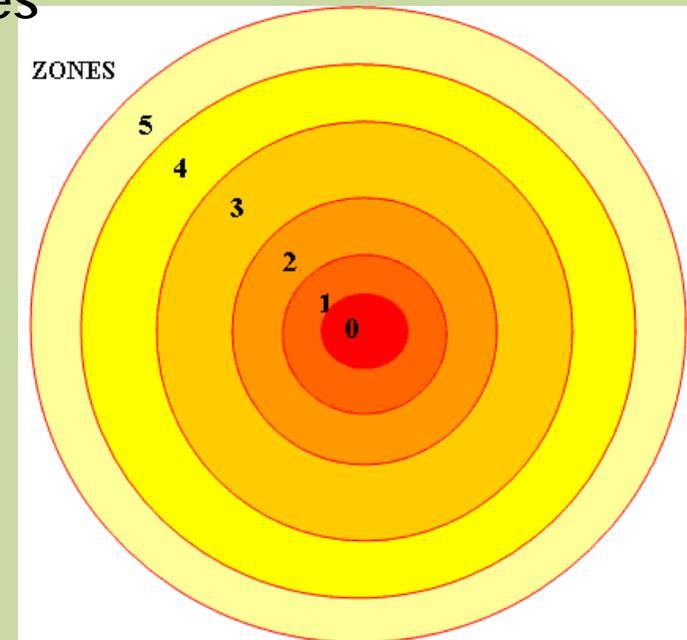
Energy Efficient Planning

Zone planning

Elevation planning

Sector planning

Permaculture Design Principles



Zone Two: The Home Orchard

- Attended every few days.
- Zone 2 is a little less intensively managed. Suitable elements to place here are spot mulched home orchards, longer cycle vegetables, main crop beds (for trading), and forage ranges for closely managed livestock such as poultry and milking goats or cows.
- Since they are visited daily for milking, feeding and supervising, the livestock and poultry shelters of Zone 2 often adjoin Zone 1.
- This Zone may be extended along frequently used paths through more outlying zones.

Zone Three: The Farm

- Attended weekly to monthly.
- Broader scale commercial crops, and animals raised for trade, along with natural trees, dams, windbreaks and barns belong.
- This area is managed with soil conditioning, green manure crops and manure from Zone 2.

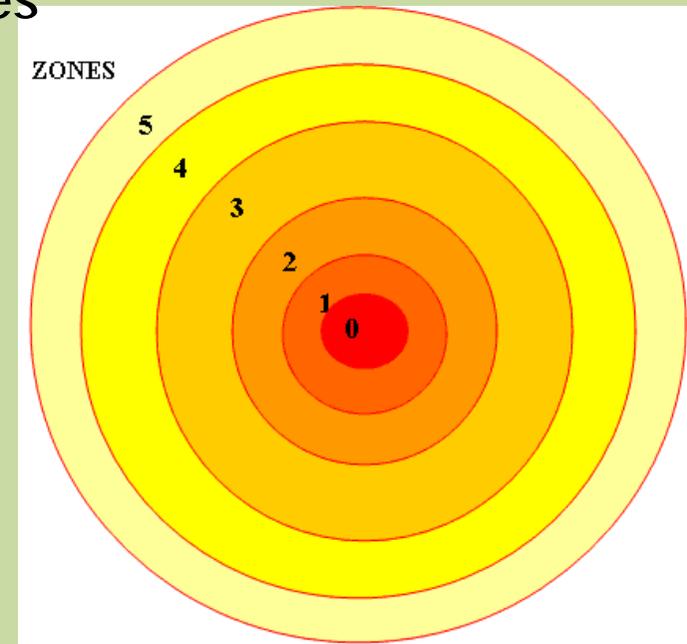
Energy Efficient Planning

Zone planning

Elevation planning

Sector planning

Permaculture Design Principles



Zone Four: Managed Forest

- Attended infrequently
- Hardy, self-care forests and woodlots that are visited infrequently for wood collection, log harvest and wild harvest belong in far flung corners of the property, and can act as buffers to protect Zone 5 wilderness areas.
- It may also be used occasionally to pasture animals.

Zone Five: Wilderness

- Visited occasionally for recreation and appreciation
- This is the component of the site left for nature.
- It comprises natural forest and native remnant and rehabilitated flora and fauna and can be linked to the home garden by a wildlife corridor extension.

Energy Efficient Planning

Zone planning

Elevation planning

Sector planning

Permaculture Design Principles

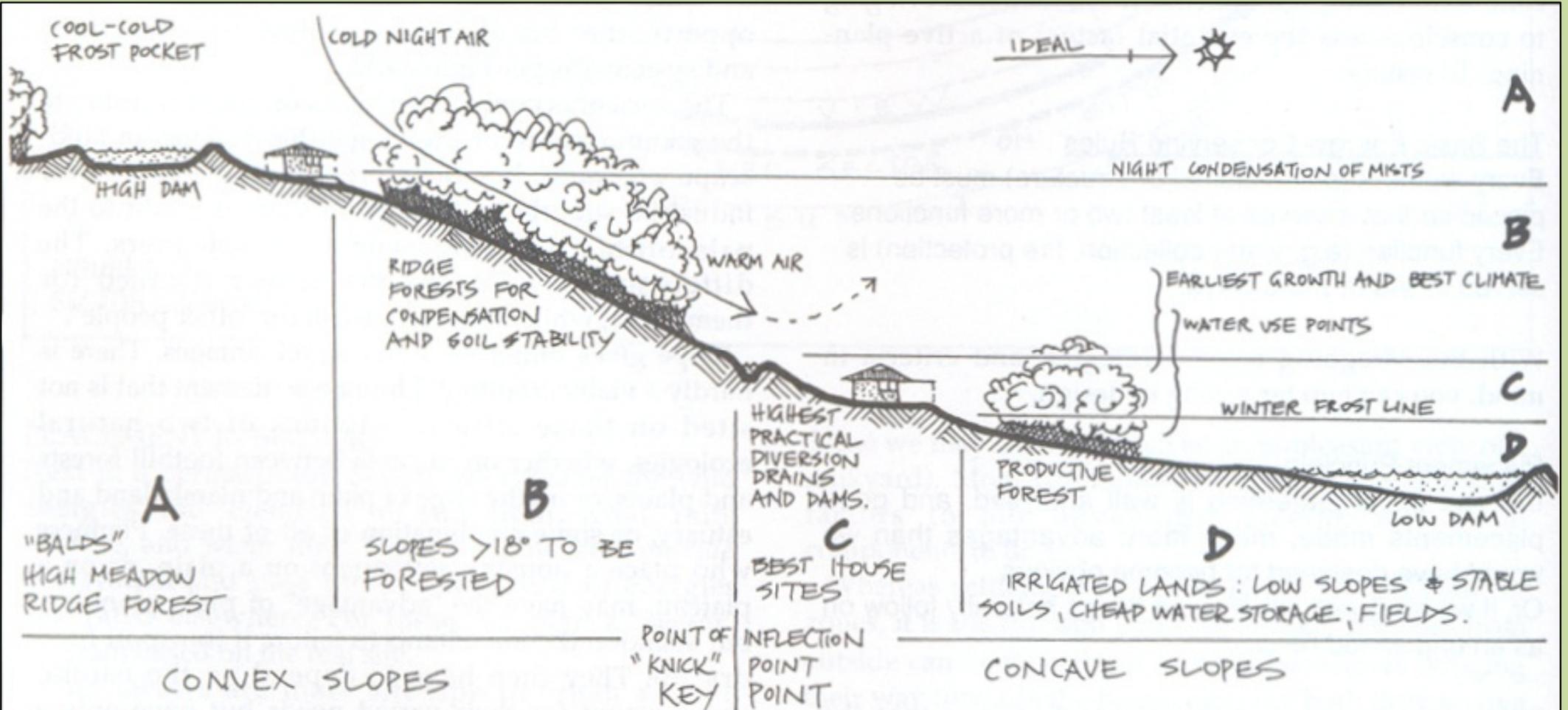


FIGURE 3.11

BROAD HUMID LANDSCAPE PROFILE.

Slope analysis and site planning in relation to aspect largely decide

the placement of access, water supply, forests, and cropland. Here we supply such analysis to a cool, humid region .

Energy Efficient Planning

Zone planning

Elevation planning

Sector planning

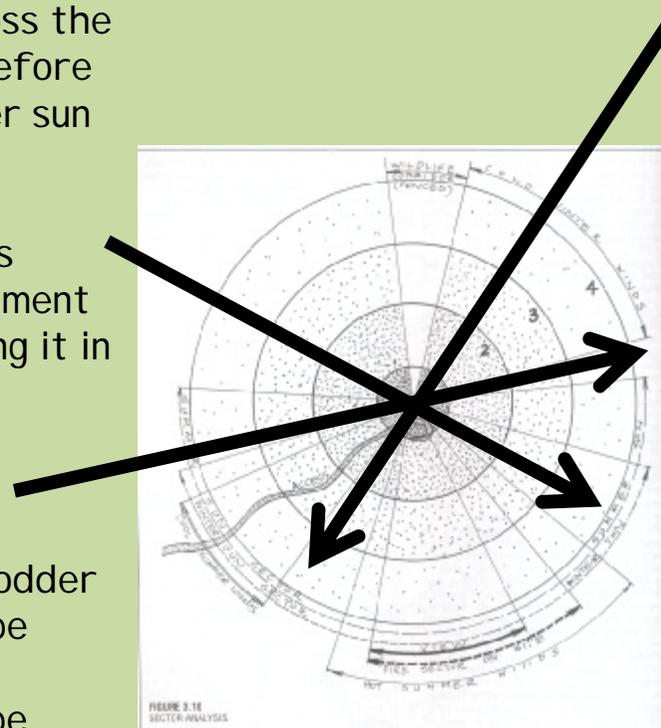
Permaculture Design Principles

The Sun's Energy

- The sun takes a different path across the sky during winter and summer, therefore assess summer sun sector and winter sun sector.
- Efficient home and site design takes advantage of this seasonal sun movement by capturing winter sun and excluding it in summer.

Wind Energy

- Site elements such as hedgerows, fodder systems, buildings and forests can be used as barriers to divert or block damaging winds. Similarly they can be arranged on your site to divert them to where they can benefit the site: towards wind turbines, or across ponds for evaporative summer cooling.
- Assess wind direction of ; - hot summer winds, cooling summer winds, cold winter winds, katabatic air flows.



The Energy of Fire

- Some site elements such as roads, stone walls, pig runs, dams, and fire retardant plants in wind break arrangements, fodder systems and orchard areas can be arranged on your site as a barrier to the fire danger sector to slow or block fire from important structures such as your home.
- Site components that increase the risk of fire, such as eucalypt woodlots, native vegetation areas, hay lofts and pine trees, should be sited away from central Zone infrastructure, and themselves be shielded from the fire sector by fire retardant barriers.

Energy Efficient Planning

Zone planning

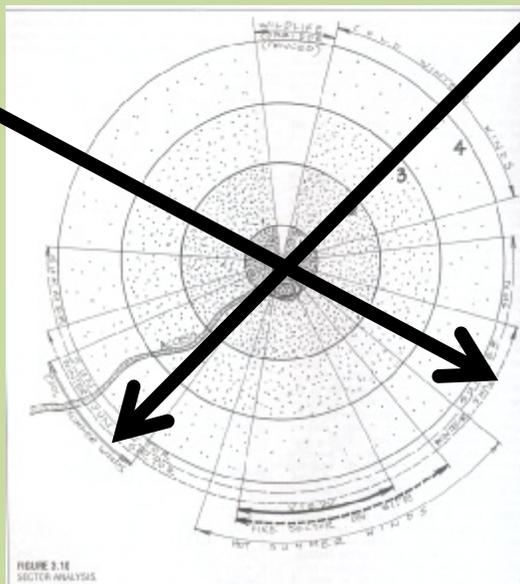
Elevation planning

Sector planning

Permaculture Design Principles

Wild Animal Energies

- Sites adjacent to a national wildlife park / natural conversation areas may be subject to influx of native and feral animal flows.
- Predator proofing :- for example, floating island in dam for geese; prickly hedges; toxic hedges, etc.
- Site pigeon towers away from the house, but adjacent to the orchards to *attract* large birds of prey, and so utilize their energies to repel wild parrots from our fruits and nuts.
- Site bat boxes adjacent to vegetable areas and within orchards.
- Establish lizard rockeries within vegetable growing areas to attract lizards that will control insects.



Water Energy

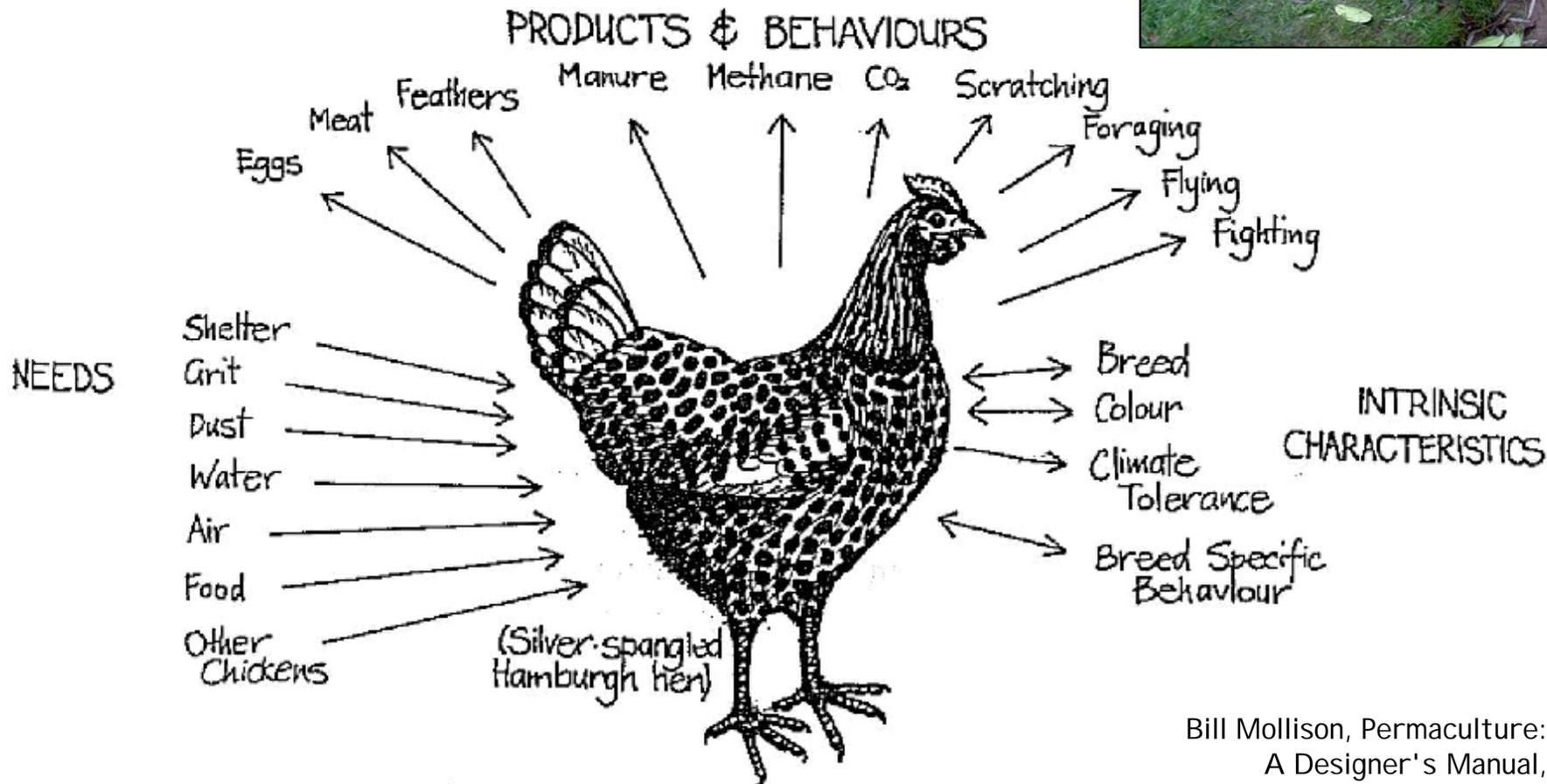
- Assess water catchments both within and beyond your property, storm watersheds, permanent creeks and swamplands, and, establish designs to capture and store water on site.
- Establish rainwater harvesting systems that use natural gravity flows.

Site all Design Components to Manage Incoming Energies of self sufficiency

The basic energy conserving rule in Permaculture landscape design is to place every element in your system so that serves more than one function, and have more than one element in place to serve each important function (eg. fire protection, water collection).

Resource Planning
Multiple function
Natural energy
Biological resource

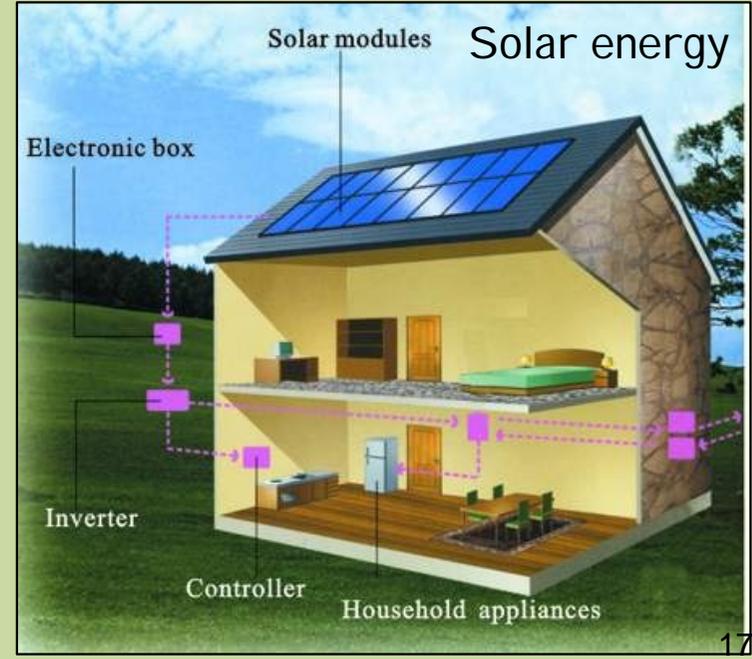
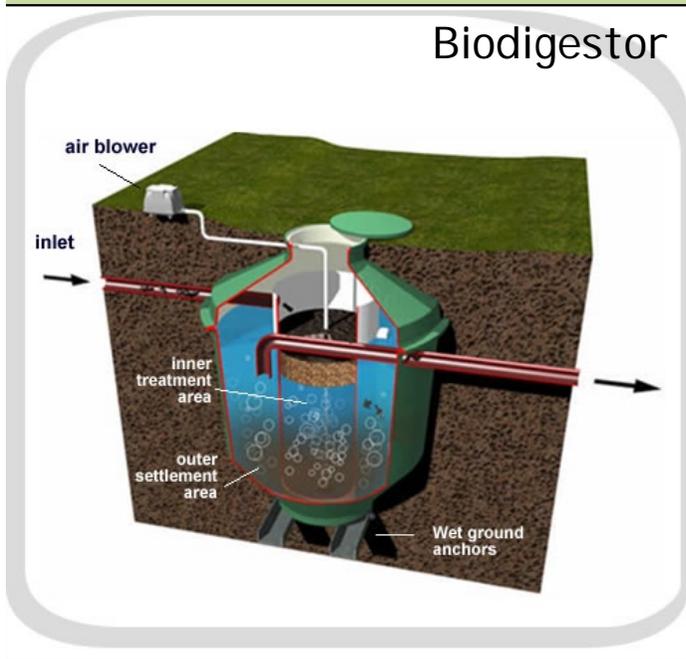
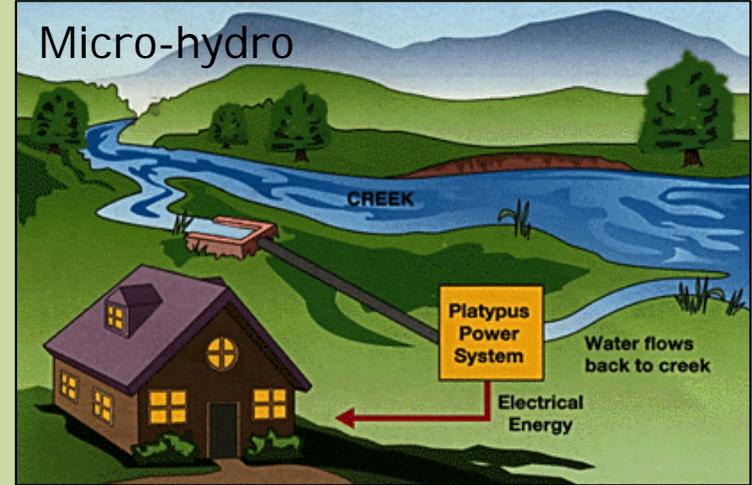
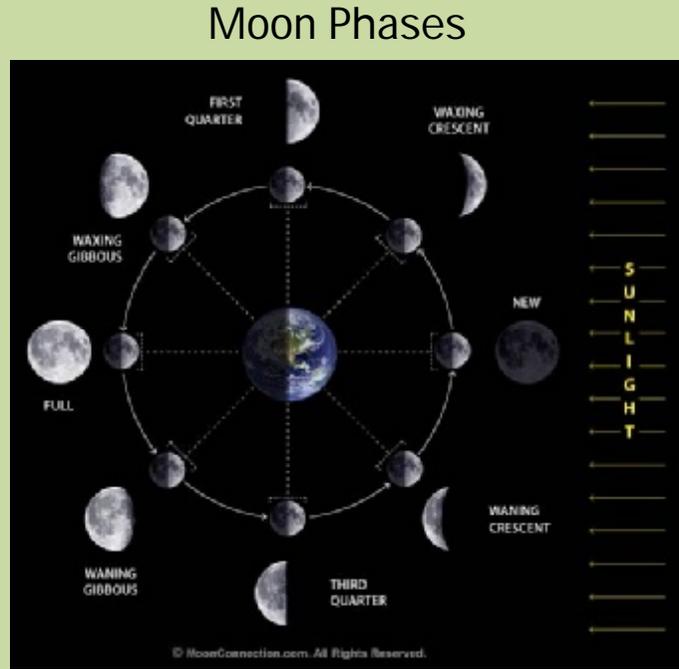
Permaculture Design Principles



Bill Mollison, Permaculture:
A Designer's Manual,

Resource Planning
Multiple function
Natural energy
Biological resource

Permaculture Design Principles



Resource Planning
 Multiple function
 Natural energy
 Biological resource

Permaculture Design Principles

Composting

Mulching

Vermiculture

Mycorestoration

Biodigestors

Ecological sanitation

Reedbeds

Mycelium webs,
 Paul Stamets

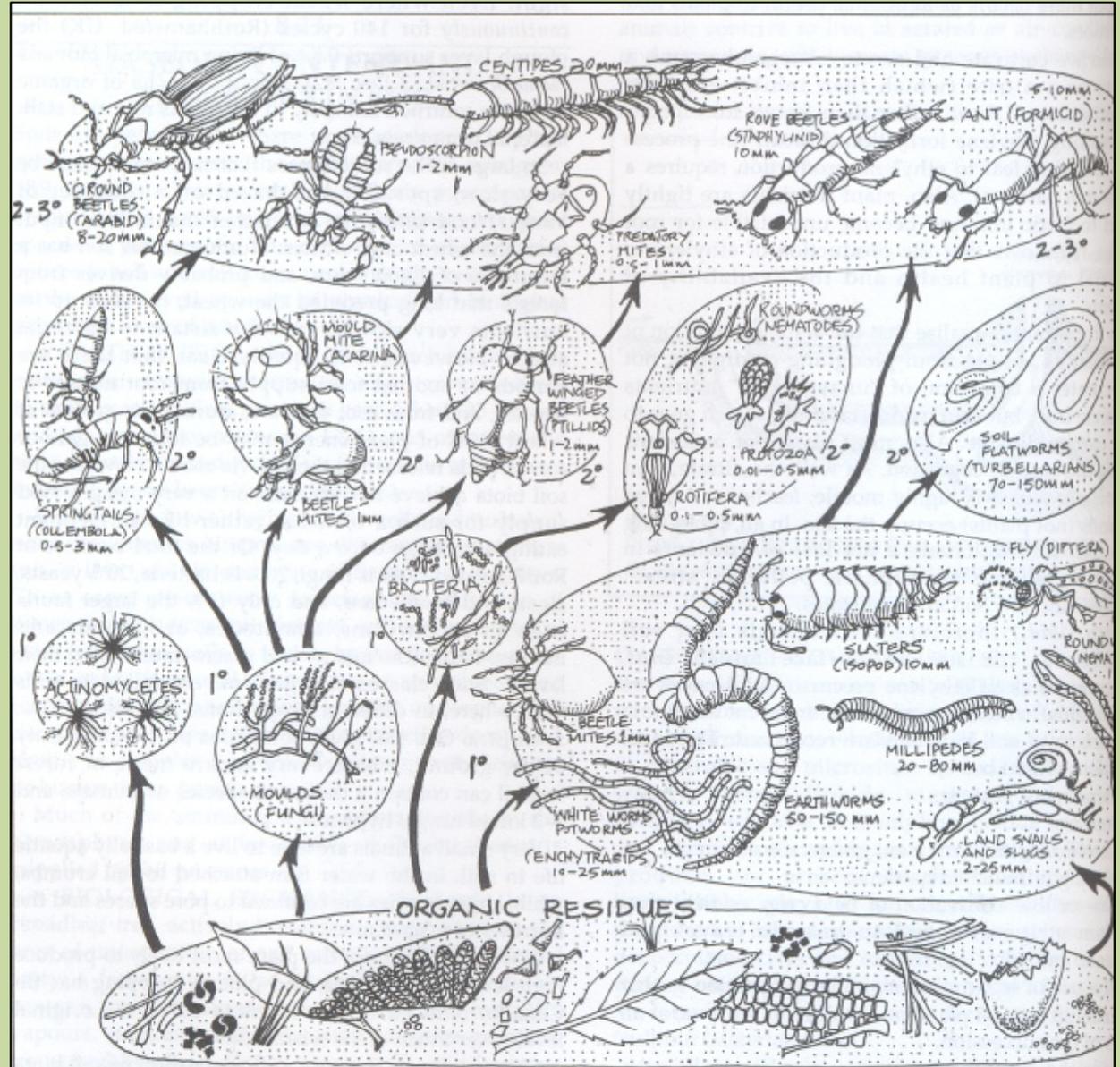
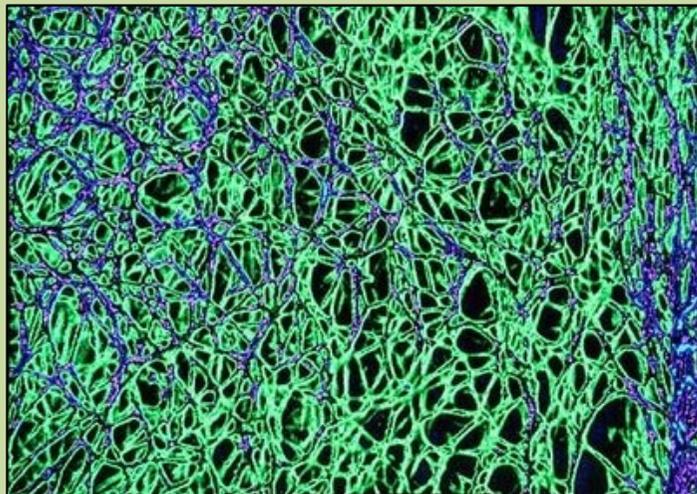


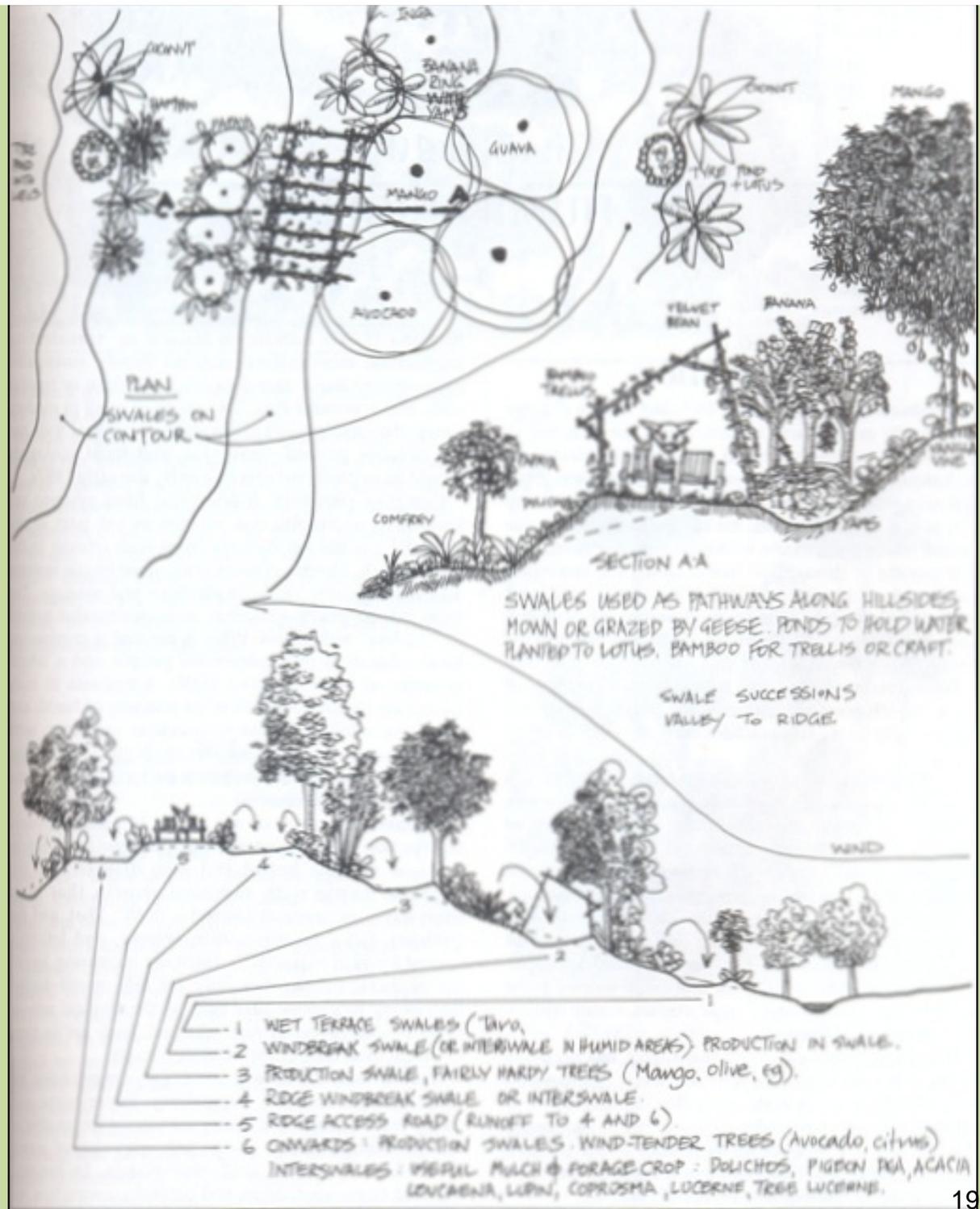
FIGURE 8.6
 FOOD WEB OF A COMPOST PILE
 Energy flows in the direction of the arrows; lengths in millimetres. 1 = first level consumers, 2 = second level, 3 = third level.

[After Daniel L.

Bill Mollison, Permaculture:
 A Designer's Manual,

Design Planning
 Relative location
 Microclimate
 Maximise edge
 Succession
 Diversity
 Pattern

Permaculture Design Principles



Bill Mollison, Permaculture:
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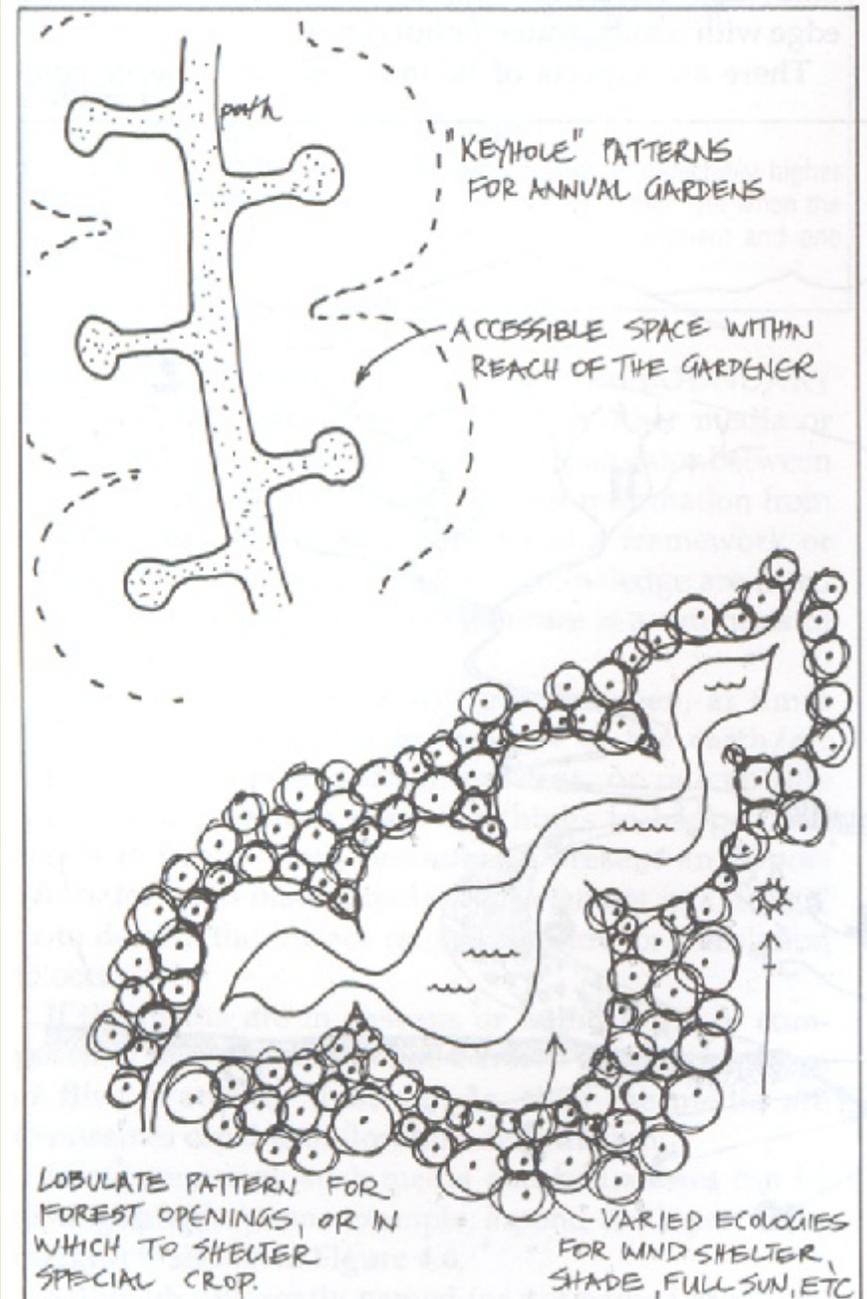


FIGURE 4.7

"Least path" design for home gardens, a keyhole pattern (common in nature) allows us to access garden beds most efficiently. Parallel paths take up to 50% of the area; keyhole beds <30% of the ground. (See also FIGURE 10.26 Gangamma's Mandala).

Design Planning
 Relative location
 Microclimate
 Maximise edge
 Succession
 Diversity
 Pattern

Permaculture Design Principles

Crop Rotation

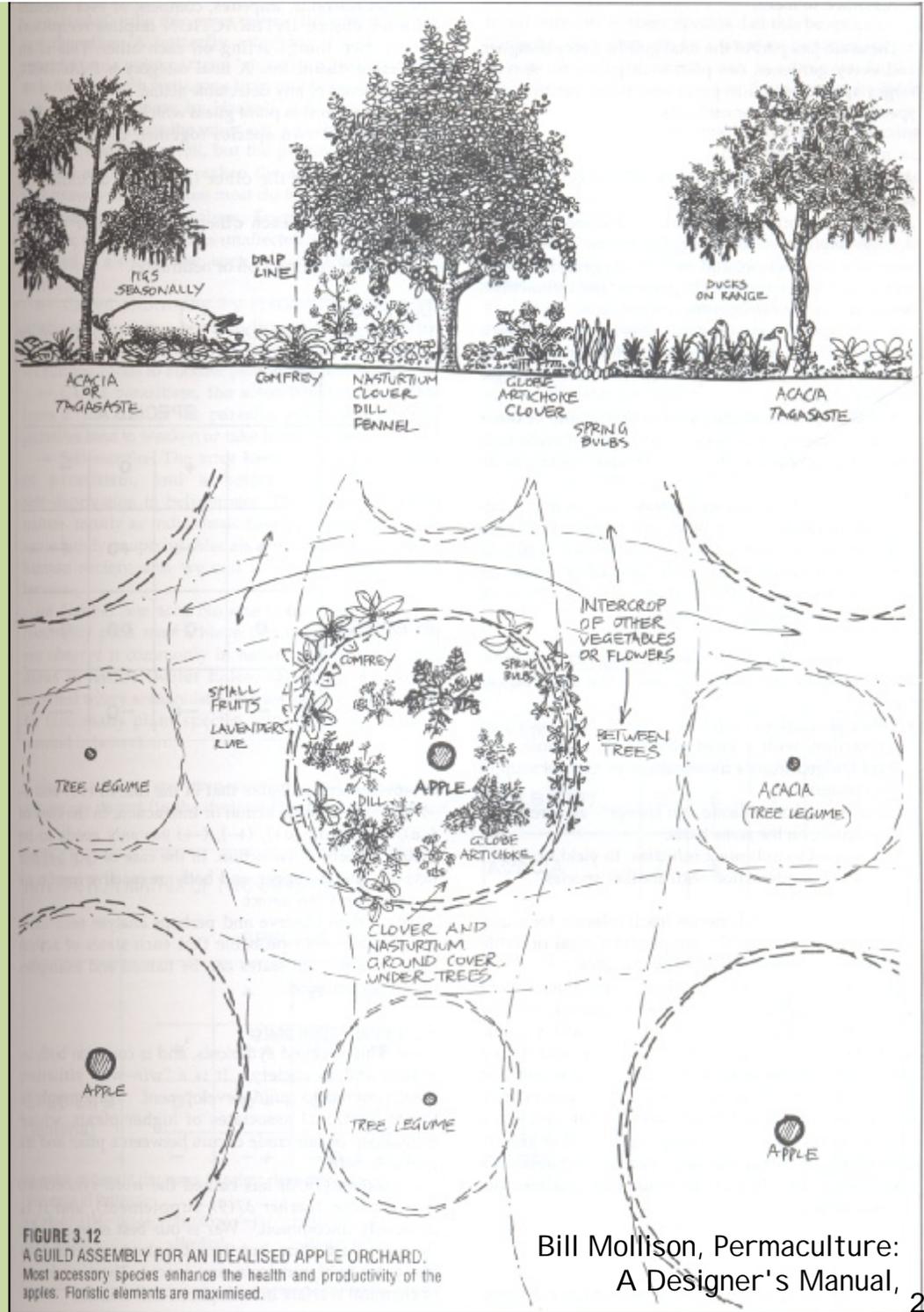
	Year 1	Year 2	Year 3	Year 4
Plot 1	root crops	pulses	potatoes	brassicas
Plot 2	brassicas	root crops	pulses	potatoes
Plot 3	potatoes	brassicas	root crops	pulses
Plot 4	pulses	potatoes	brassicas	root crops

First Year Planting

root crops carrots, parsnips, beetroot, salsify, etc.	brassicas cabbage, savoy, cauliflower, broccoli, sprouts, turnips	potatoes potatoes, celery, leeks, etc.	pulses peas, beans, onions, shallots
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Permanent Crops

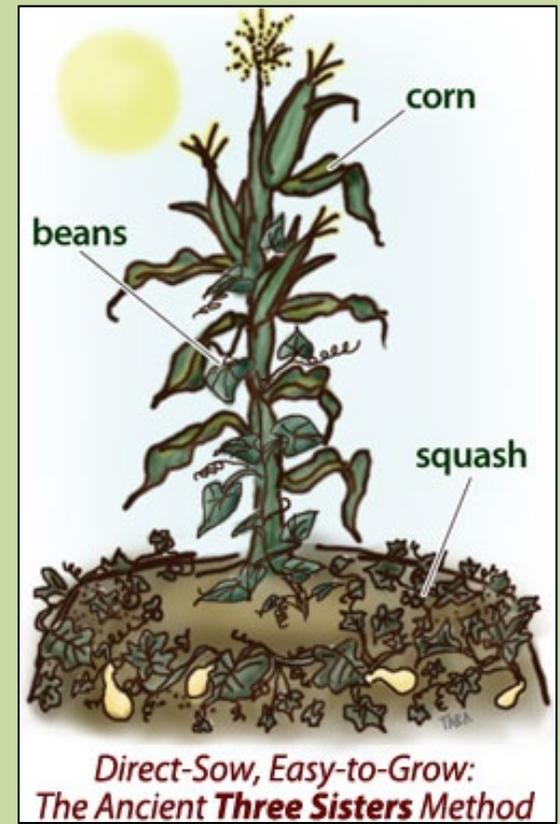
Herbs, asparagus, rhubarb, etc.



Bill Mollison, Permaculture:
 A Designer's Manual,

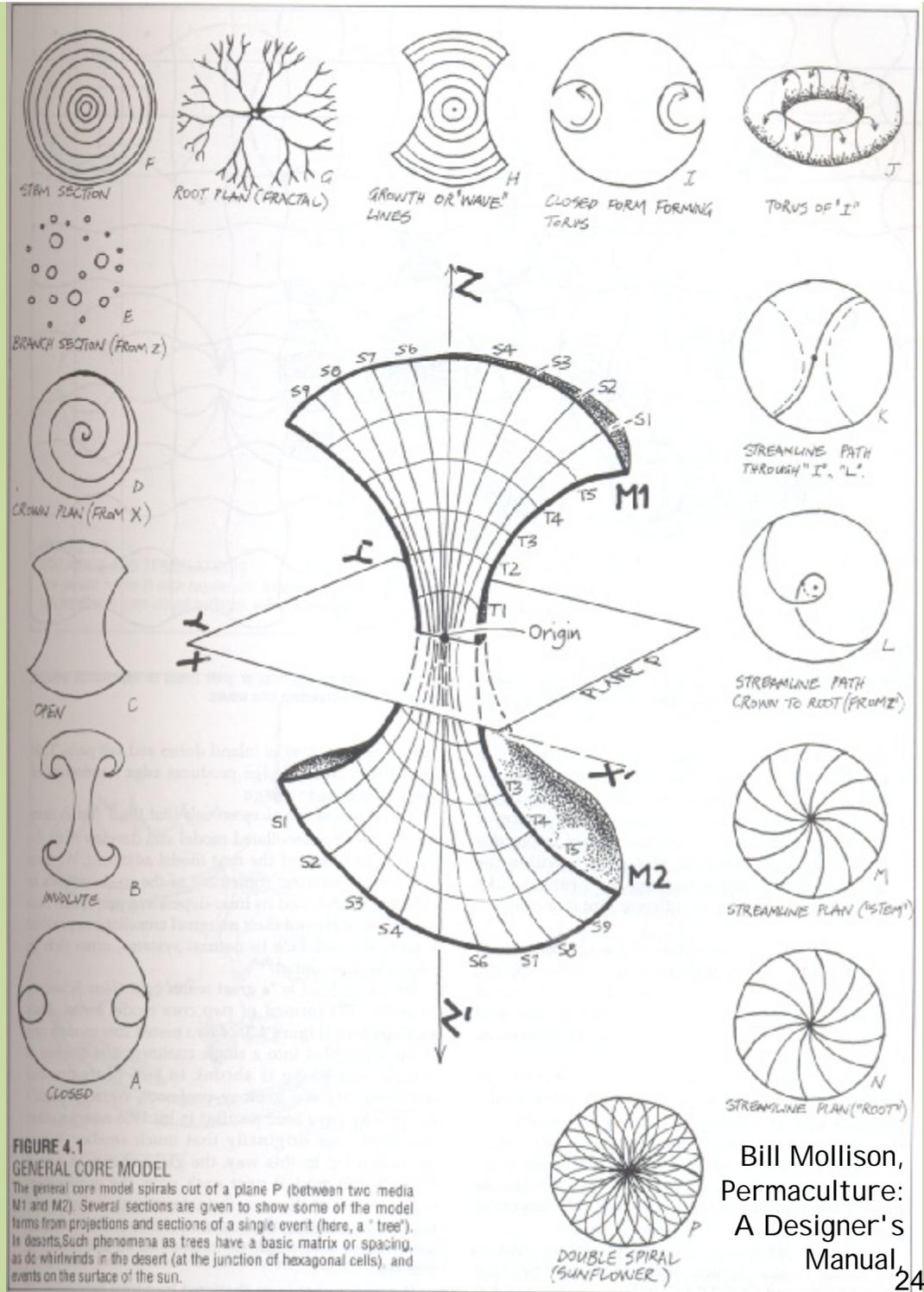
Design Planning
Relative location
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Maximise edge
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Permaculture Design Principles



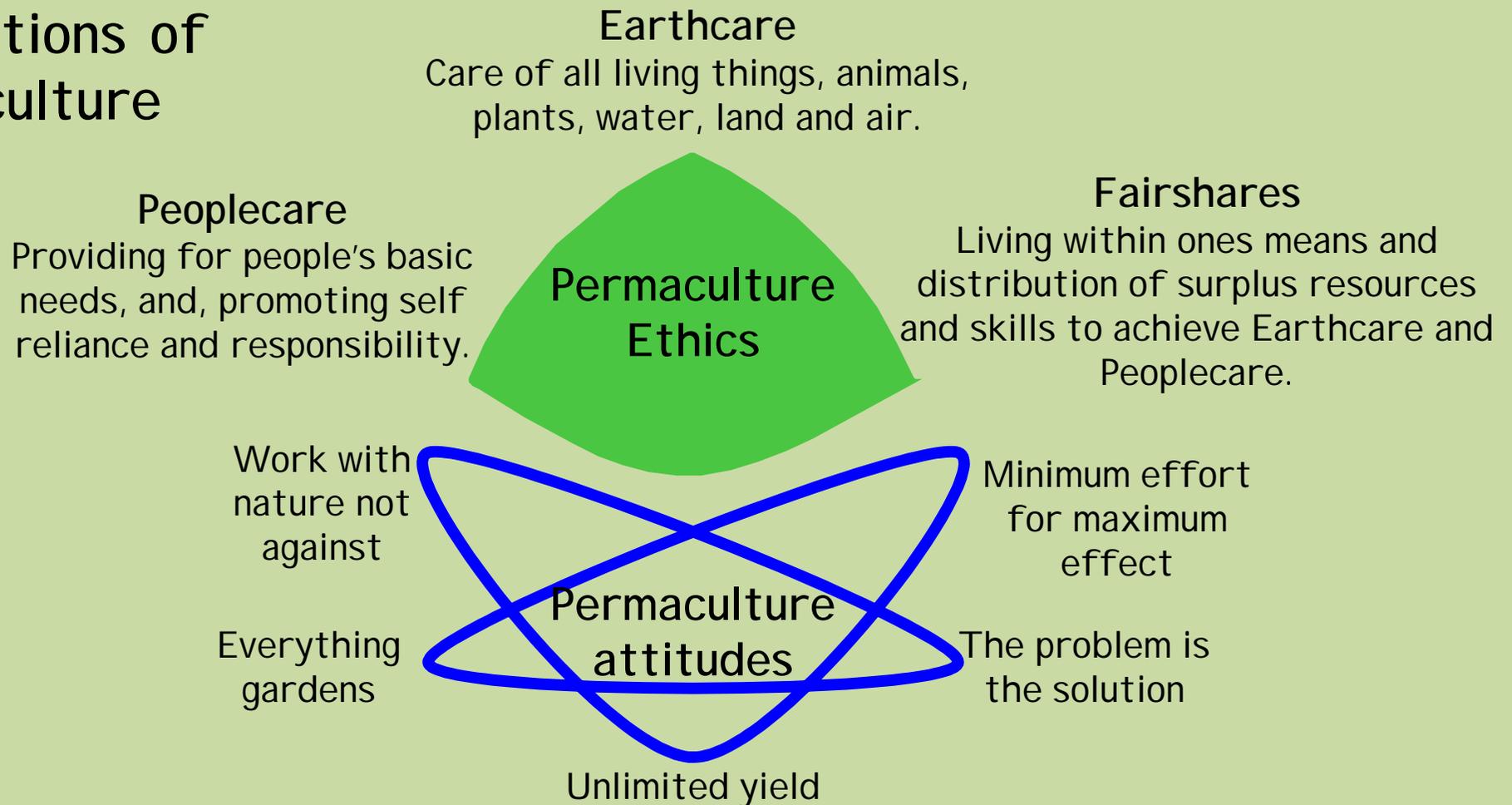
Design Planning
 Relative location
 Microclimate
 Maximise edge
 Succession
 Diversity
 Pattern

Permaculture Design Principles



Bill Mollison,
 Permaculture:
 A Designer's
 Manual

Foundations of Permaculture Design



Permaculture Design Principles

Energy Efficient Planning

Zone planning
Elevation planning
Sector planning

Resource Planning

Multiple function
Natural energy
Biological resource

Design Planning

Relative location
Microclimate
Maximise edge
Succession
Diversity
Pattern

Dave Holmgren's Permaculture Principles

Permaculture Design Principles

- 1 Observe and Interact**
Beauty is in the eye of the beholder



- 2 Catch and Store Energy**
Make hay while the sun shines



- 3 Obtain a Yield**
You can't work on an empty stomach



- 4 Apply Self-regulation and Accept Feedback**
The sins of the fathers are visited on the children unto the seventh generation



- 5 Use and Value Renewable Resources and Services**
Let nature take it's course



- 6 Produce No Waste**
*A stitch in time saves nine
Waste not, want not*



- 7 Design from Patterns to Details**
Can't see the wood for the trees



- 8 Integrate Rather than Segregate**
Many hands make light work



- 9 Use Small and Slow Solutions**
*The bigger they are, the harder they fall
Slow and steady wins the race*



- 10 Use and Value Diversity**
Don't put all your eggs in one basket



- 11 Use Edges and Value the Marginal**
Don't think you are on the right track just because it is a well-beaten path



- 12 Creatively Use and Respond to Change**
Vision is not seeing things as they are but as they will be



From: David Holmgren (2002) Permaculture: Principles & Pathways Beyond Sustainability

First steps to your Permaculture Garden



- Mulching
- Composting
- Mycelium running
- Organic seed exchange
- Planting diversity
- Vermiculture
- Rainwater harvesting with swales & vetiver grass
- Create microclimates
- Grey water recycling
- Form your Permaculture Guild Group

Thank You