Random assembly

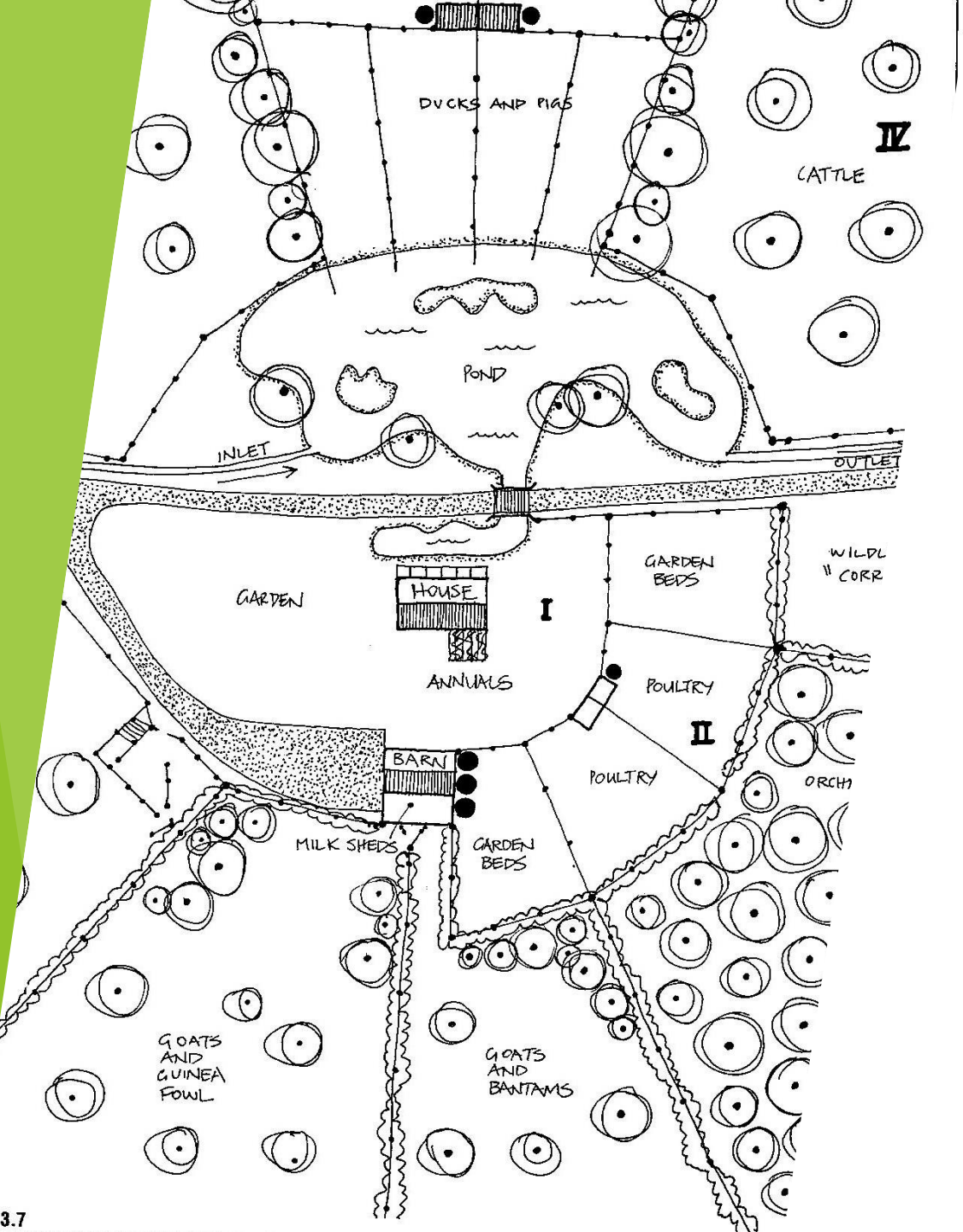
Explore the relationships between functions, elements and systems

Random assembly

Function	Element	System
Food production	Raised bed/ compost/ tool shed/ water butt	Forest garden, IPM
Cash crop	Willow/ Grains/ Cheese	Pasture/ field rotation
Wildlife habitat	Regeneration/ min till	Forest, hedge management
Water catchment	Pond, swale, water butt	Site wide strategy
Space for people	Shed/ tea room/ toilet	Management/ induction

TABLE 3.3:
SOME FACTORS WHICH CHANGE IN ZONE PLANNING AS DISTANCE INCREASES.

Factor or Strategy	ZONE I	ZONE II	ZONE III	ZONE IV
Main design for:	House climate, domestic sufficiency.	Small domestic stock & orchard.	Main crop forage, stored.	Gathering, forage, forestry, pasture.
Establishment of plants	Complete sheet mulch.	Spot mulch and tree guards.	Soil condition-ing and green mulch.	Soil conditioning only.
Pruning and trees	Intensive cup or espallier trellis.	Pyramid and built trellis.	Unpruned and natural trellis.	Seedlings, thinned to selected varieites.
Selection of trees	Selected dwarf or multi-graft.	Grafted varieties and plants managed.	Selected seedlings for later grafts. by browse.	Thinned to selected varieties, or
Water provision	Rainwater tanks, bores wind pumps. reticulation.	Earth tank and wells, bores,	Water storage fire control.	Dams, rivers, in soils, dams.
Structures	House/green-house, storage integration.	Greenhouse and barns, poultry sheds.	Feed store, field shelter.	Field shelter grown as hedgerow and woodlot
Information	Stored or generated by people.	In part affected by other species.	As for II.	Arising from natural processes.


DUCKS AND PIGS
IV
CATTLE
POND
INLET
OUTLET
GARDEN
HOUSE
I
GARDEN BEDS
WILDL
CORR
ANNUALS
POULTRY
II
BARN
POULTRY
ORCH
MILK SHEDS
GARDEN BEDS
GOATS AND GUINEA FOWL
GOATS AND BANTAMS

3.7

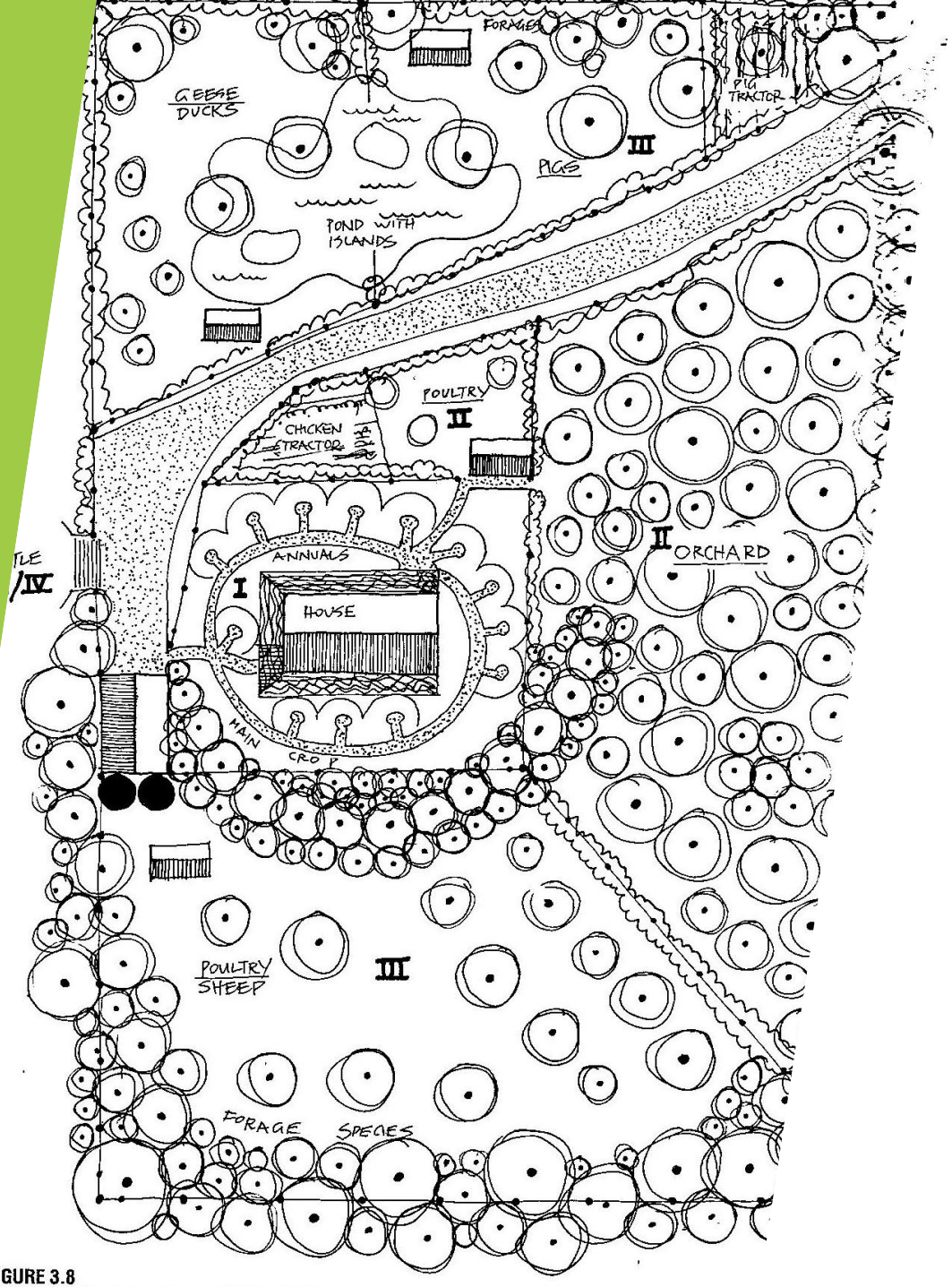
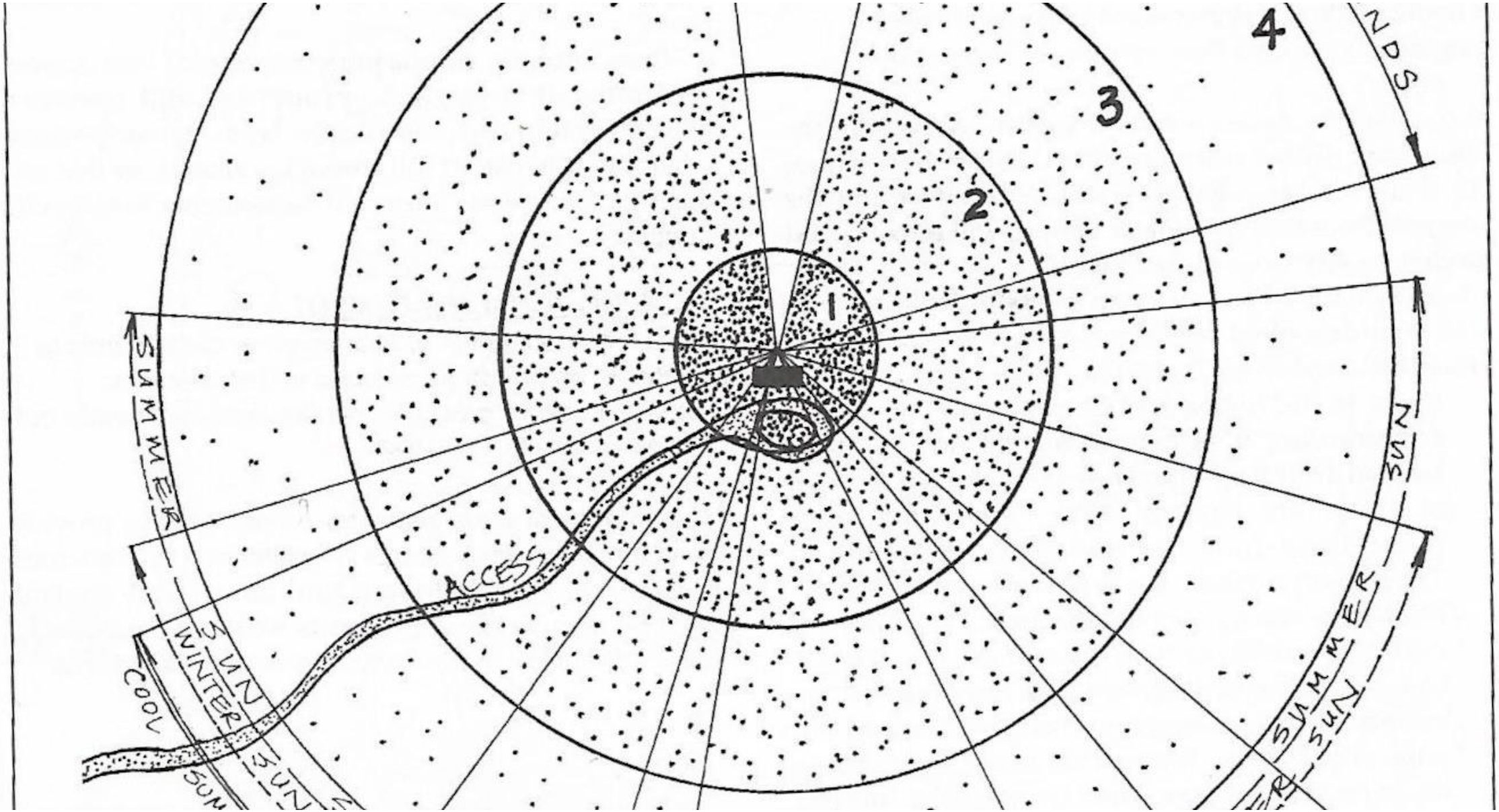

FORAGE
GEESE
DUCKS
PIG
TRACTOR
III
PIGS
POND WITH
ISLANDS
POULTRY
II
CHICKEN
TRACTOR
ANNUALS
I
HOUSE
II ORCHARD
MAIN
CROP
POULTRY
SHEEP
III
FORAGE SPECIES

FIGURE 3.8


4
3
2
1
NDS
SUMMER
ACCESS
WINTER
SUN
SUMMER
SUN
SUMMER
SUN
COOV

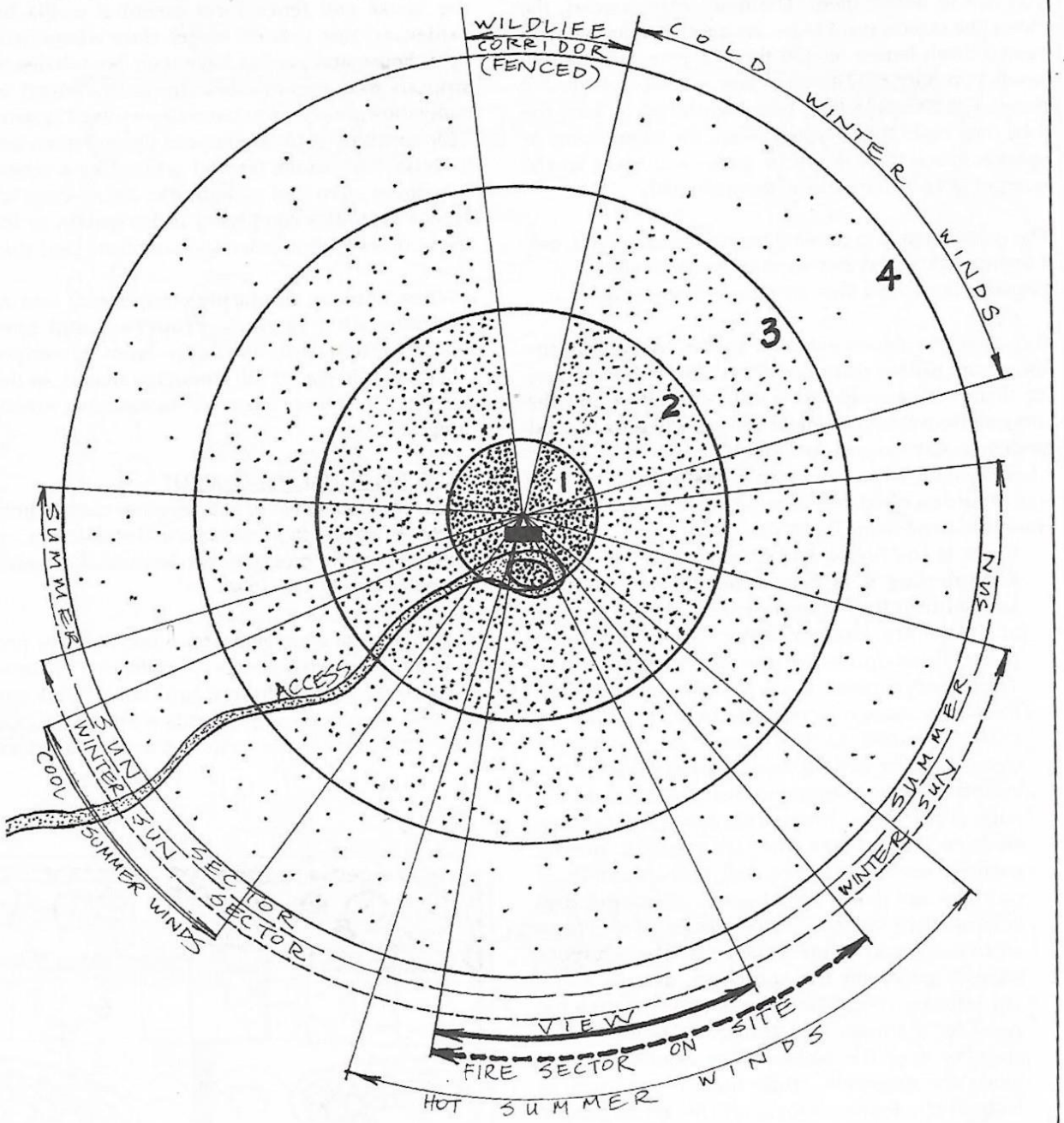


FIGURE 3.10
SECTOR ANALYSIS.

Elevation in design

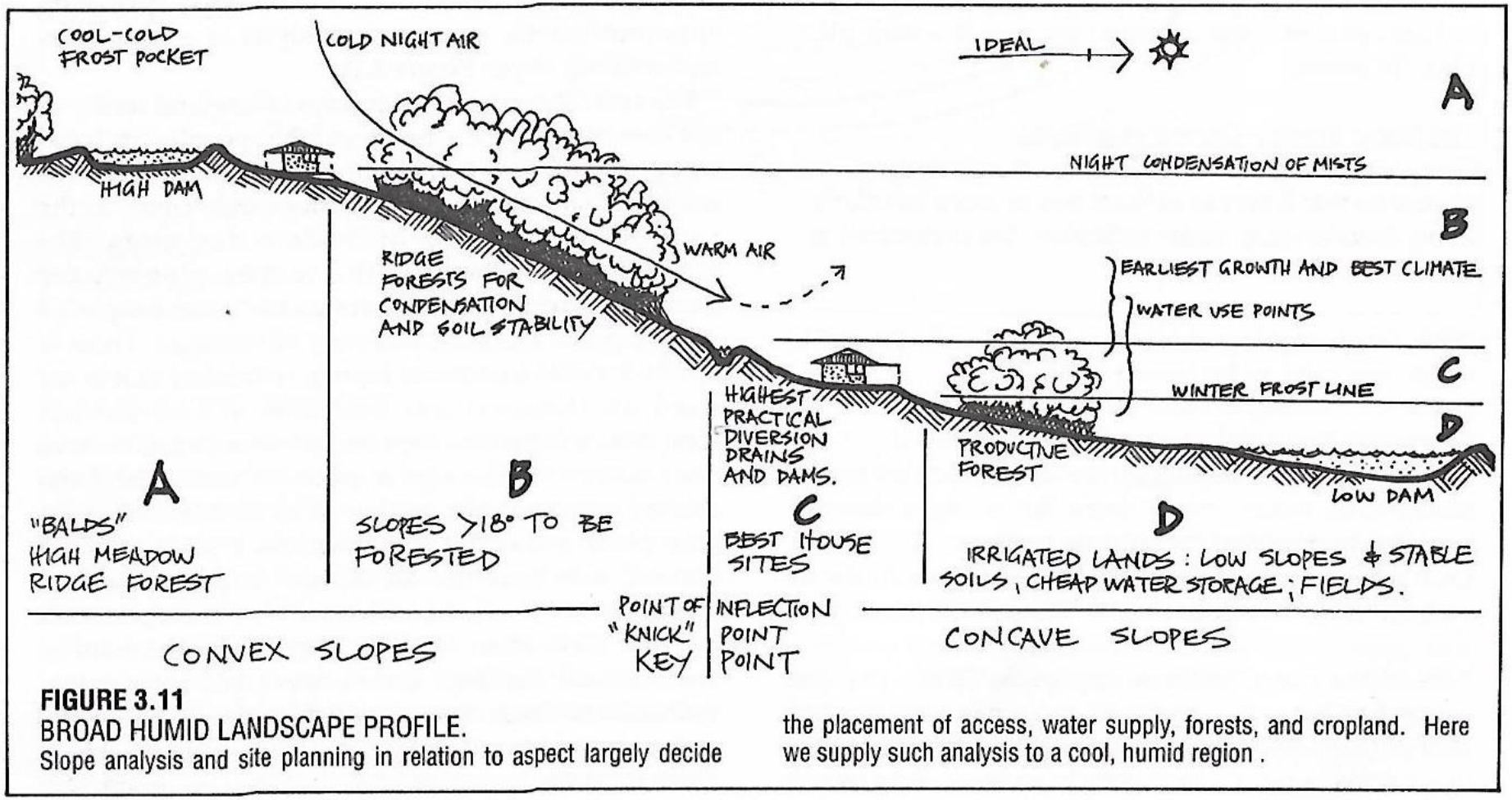
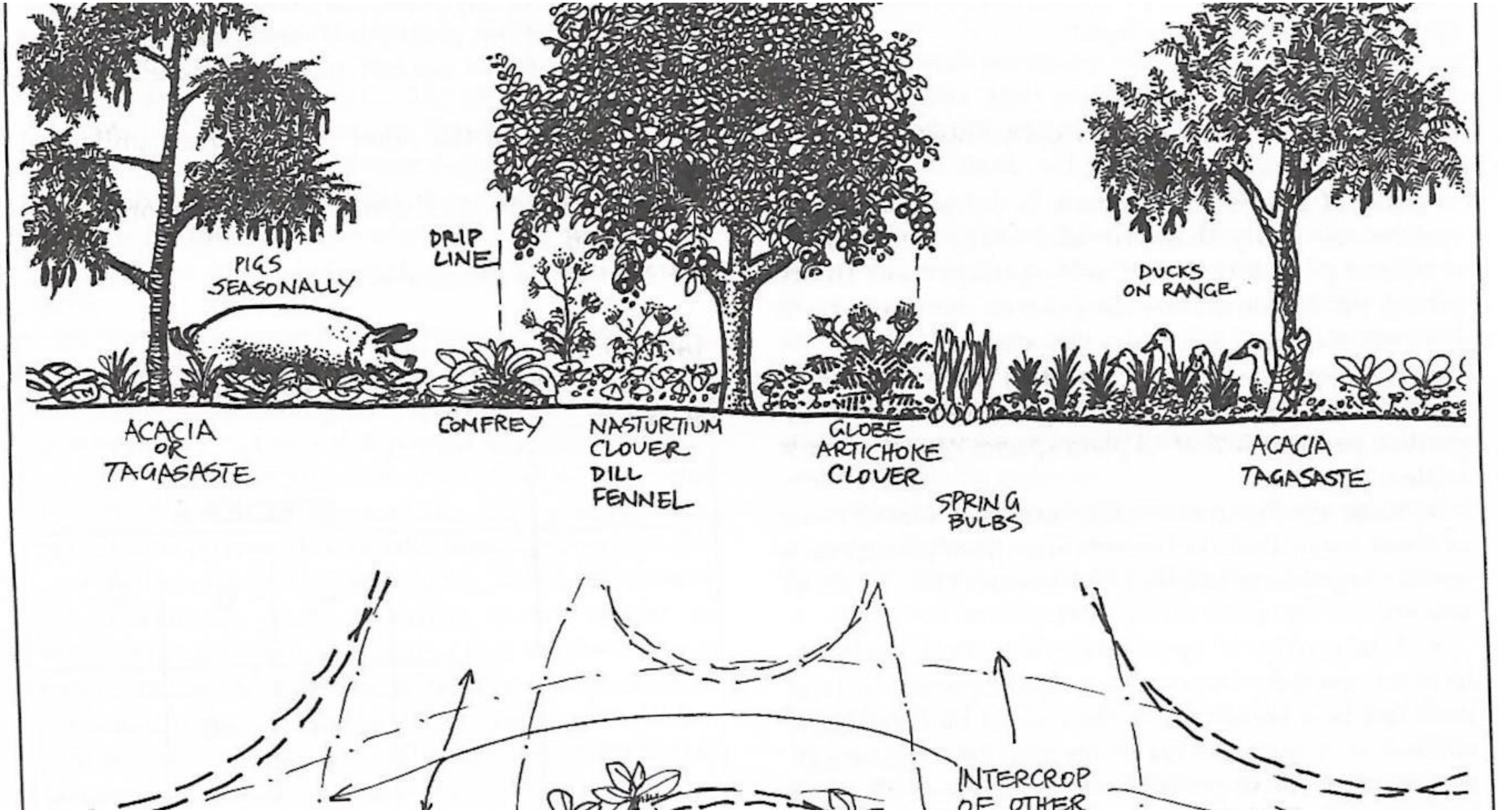
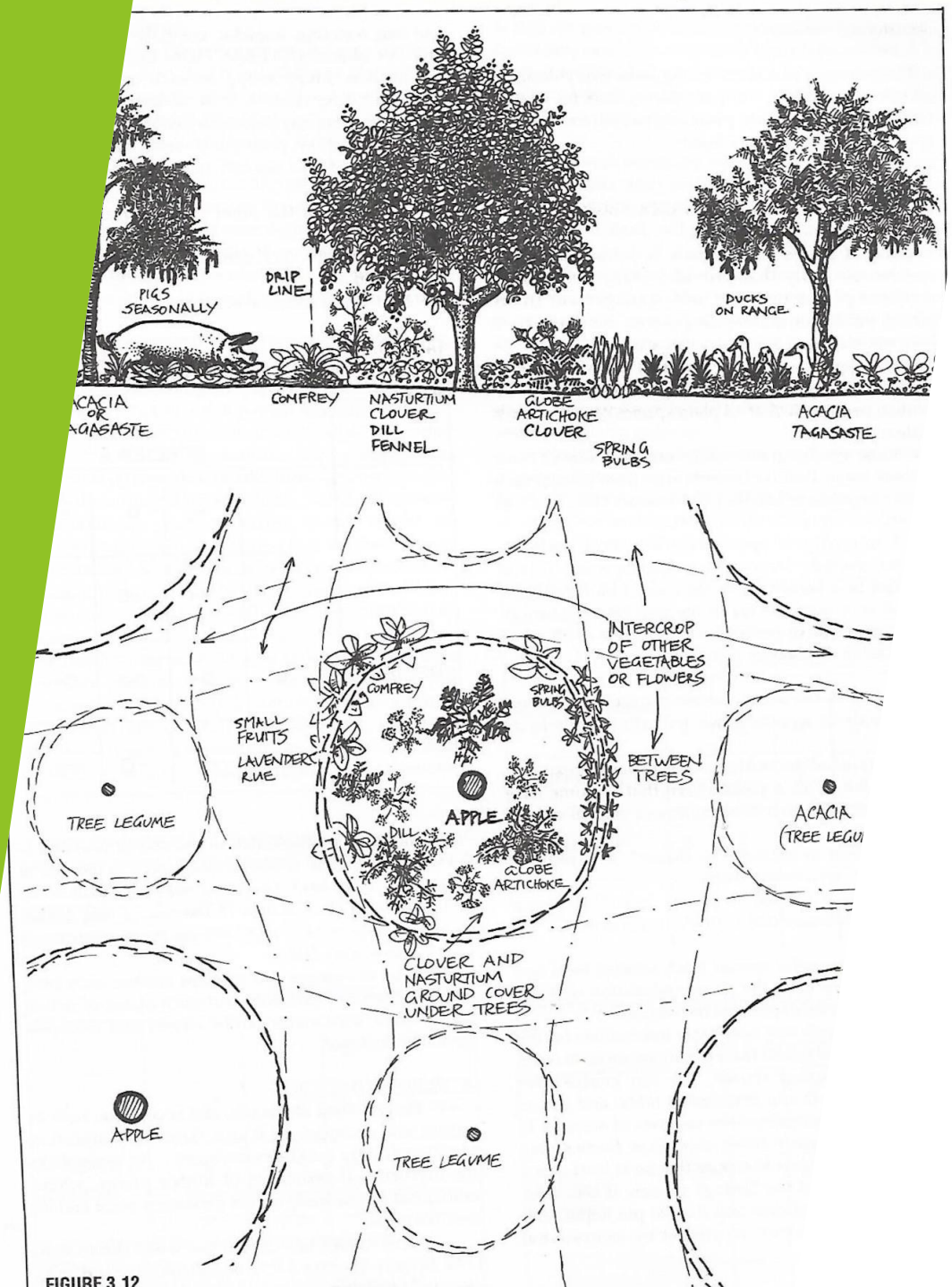


FIGURE 3.11
BROAD HUMID LANDSCAPE PROFILE.
Slope analysis and site planning in relation to aspect largely decide the placement of access, water supply, forests, and cropland. Here we supply such analysis to a cool, humid region .

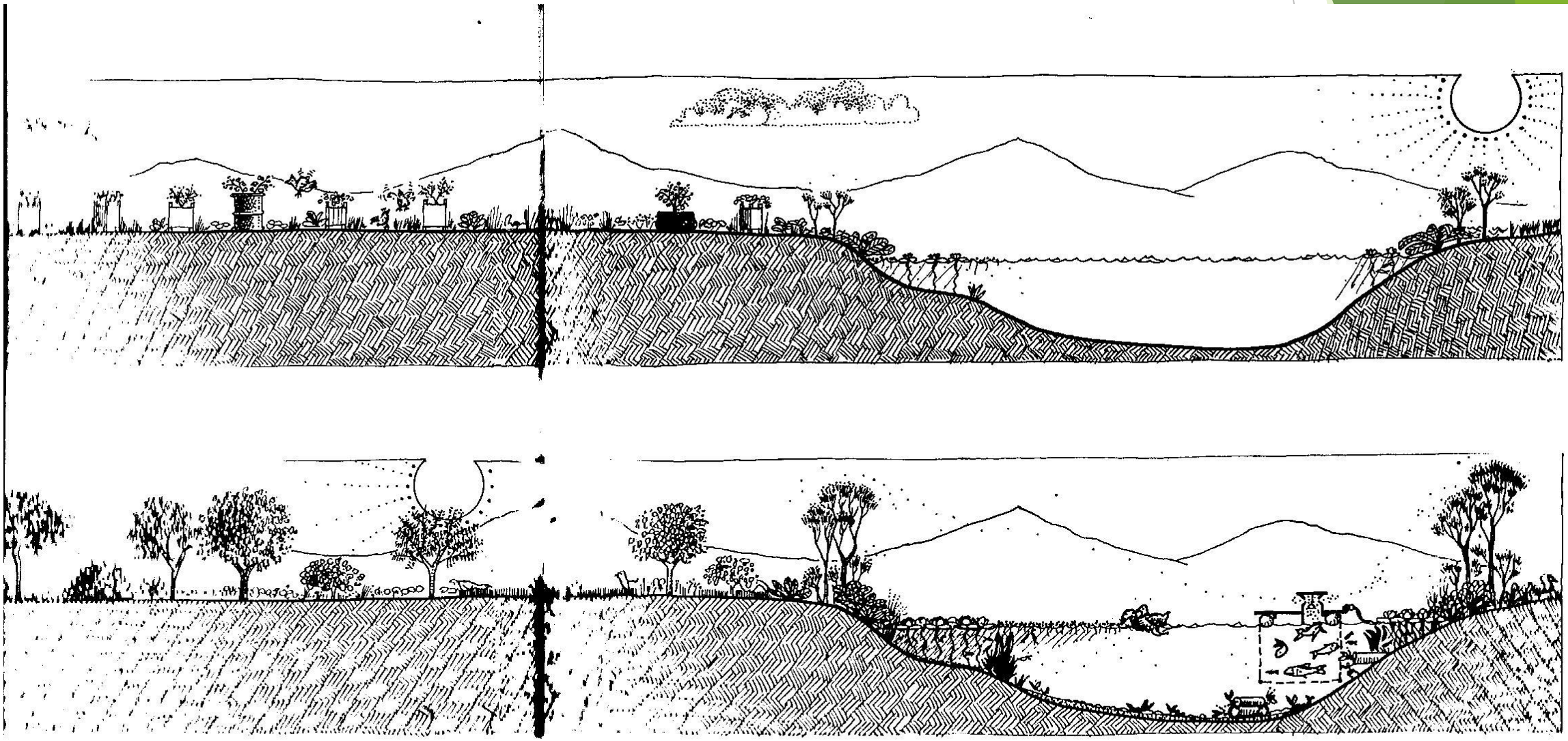

PIGS SEASONALLY
DRIP LINE
DUCKS ON RANGE
ACACIA OR TAGASASTE
COMFREY
NASTURTIUM
CLOVER
DILL
FENNEL
GLOBE ARTICHOKE CLOVER
SPRING BULBS
ACACIA TAGASASTE
INTERCROP

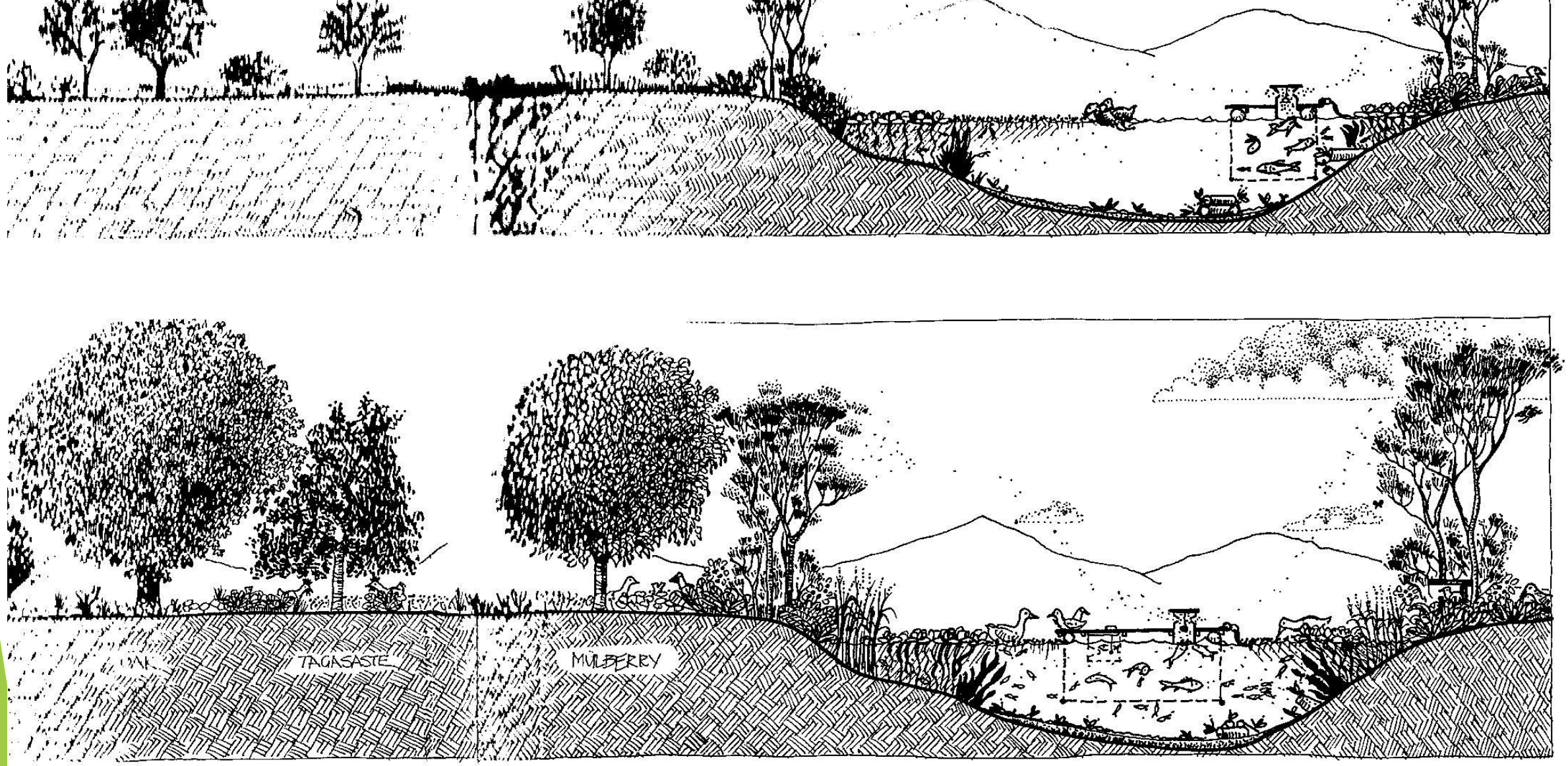


Plant guilds create habitat

- Multiple elements combine to create a stronger and more efficient system
- Increase the velocity of nutrient cycling as well efficiency
- Microclimate can be explored to best advantage
- Design to establish mutually beneficial relationships

Succession





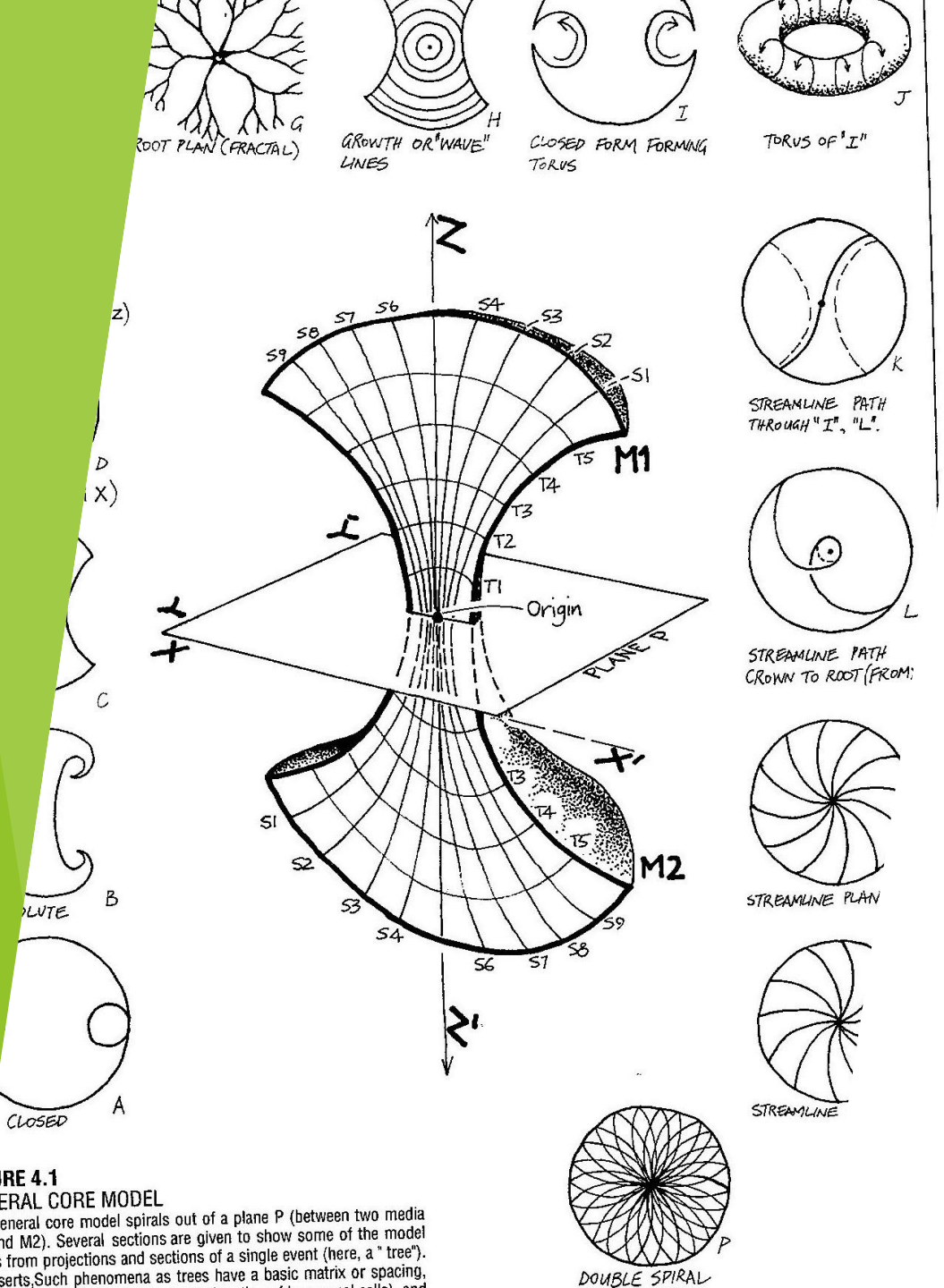
...beginning, an area is fenced and a complex of species ...ted to fail from grazers by fencing and tree guards. Ponds ... only small livestock (chickens) and some annual ...vested.

B. The system evolves to a semi–hardy stage. Geese, fish, and shellfish are introduced, and crops include some aquatic plant species.

C. An evolved system provides forage, firewood, aquatic and animal products. Larger foragers (sheep, pigs) can be grown seasonally. The system provides its own mulch and fertilizers. The mature system requires management rather than energy input, and has a variety of marketable yields (including information).

Chapter 4.Pattern Understanding

- Pattern archetypes
- Observation from natural systems
- Edge effect
- Tessellation
- Spirals



RE 4.1
ERAL CORE MODEL
eneral core model spirals out of a plane P (between two media
nd M2). Several sections are given to show some of the model
from projections and sections of a single event (here, a " tree").
serts,Such phenomena as trees have a basic matrix or spacing,

Cardioid core model

Tessellation

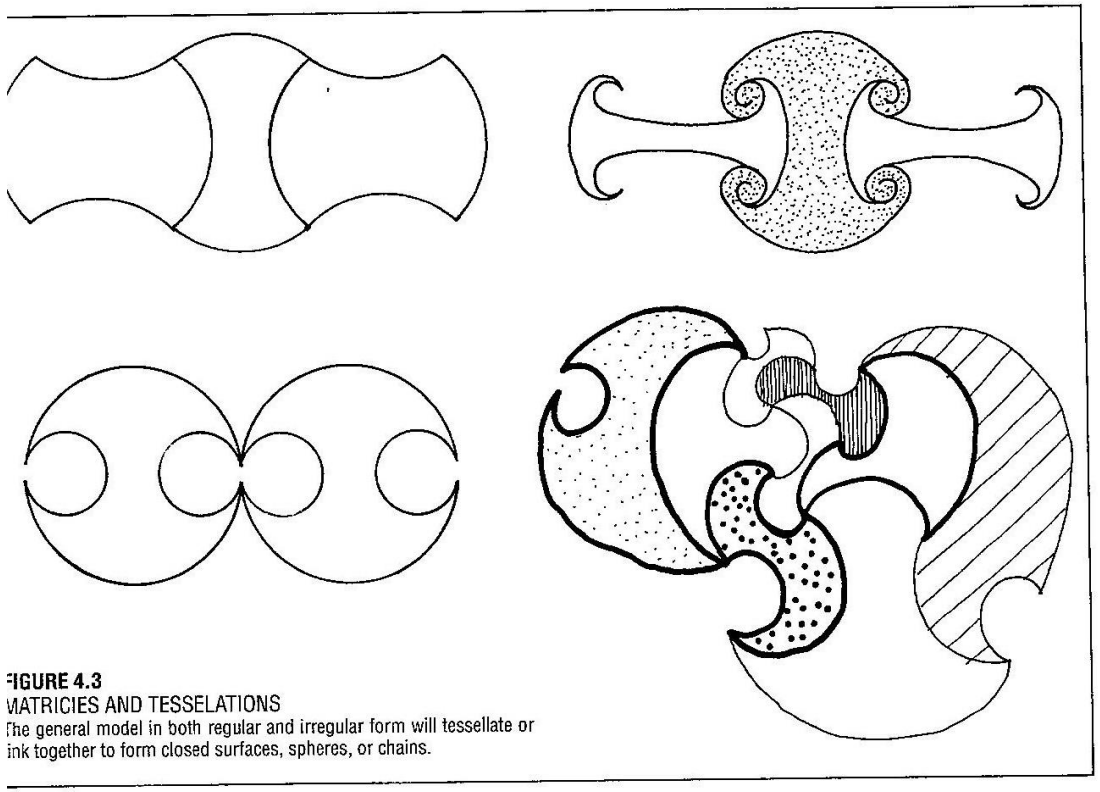


FIGURE 4.3
MATRICIES AND TESSELATIONS
The general model in both regular and irregular form will tessellate or link together to form closed surfaces, spheres, or chains.

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(see also: *Model Engineer* 3 May '51, 8 Sep '60; *Hobbies* Nov 1966; and*New Scientist* 22/29 Dec '83).

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(The basic book on fractals, computer graphics)

Murchie, Greg, *The Seven Mysteries of Life*, 1984, self–published: Marlborough, NH, USA.

Pearce, Peter, *Structure in Nature as a Strategy for Design*, M.I.T. Press, 1979.

Schwenke, Theodore, *Sensitive Chaos; the Creation of Flowing Forms in Air or Water*, Schocken Books, N.Y., 1976.

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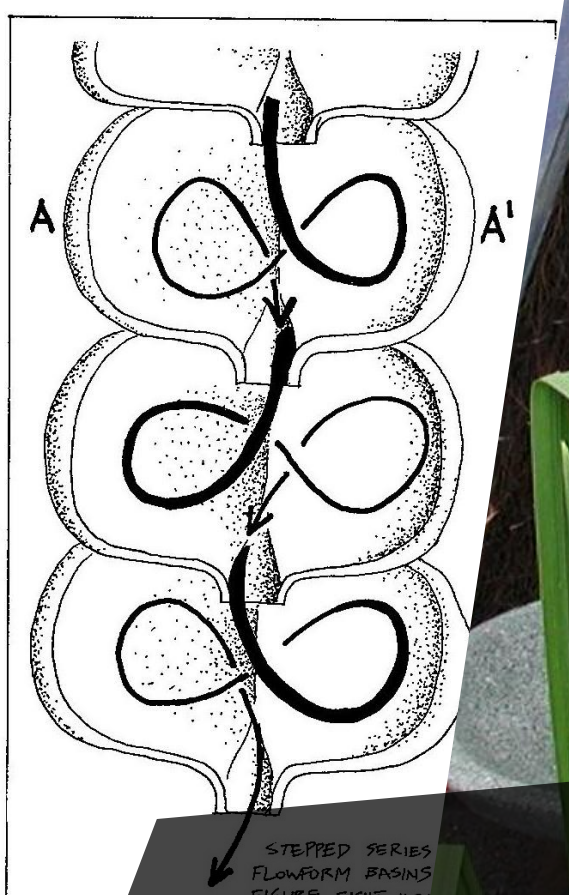
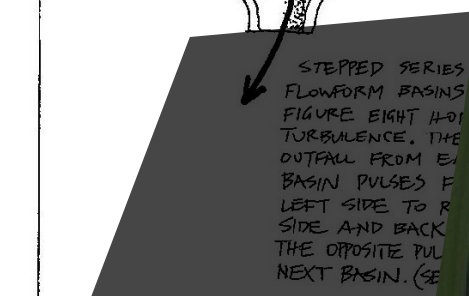
(Multiple examples of forms in nature, spirals)





Flow

4.17

ERS AND DIMENSIONS

rder of branching (as in our river) that we
nsight into the order of orders, and the
f orders. At each point of branching (or size
ne change) everything else changes, from
flows, velocities, and gaseous exchange, to
rms that associate with the specific size of

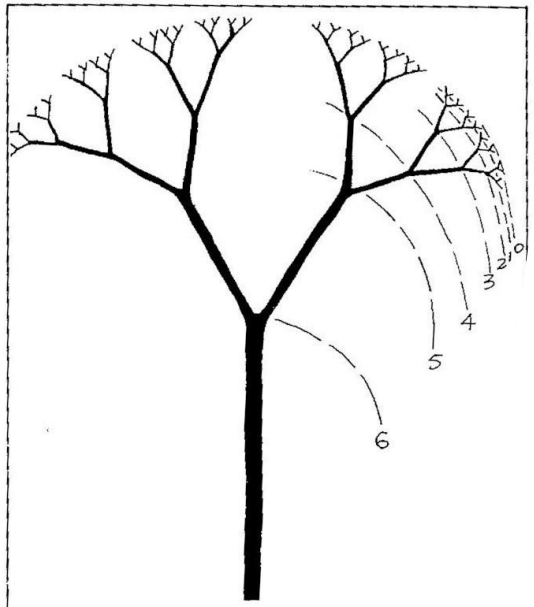


FIGURE 4.25
DENDRITIC BRANCHING.
A regular "tree" based on the proportion of real rivers. The ogi
curved lines, can be viewd as pulses of growth, waves appro
the viscous "shoreline" of the leaves or (in the case of rivers) t
seepage of upland rills. Here, seven orders of branches exis
orders become difficult to develop towards the diffusion
where viscous flow slows the movement of fluids.

TABLE 4.1:
STREAM ORDERS AND SOME RATIOS.

A Folk Name	B Stream Order	C Number of Channels in the Order	D Ratio of bifurcation/	E A. Length Channels branching	F Ratio of Length (km)
Sheet Flow	0	-	-	-	-
Rill	1	308	x 3.5	0.28	x 2.0
Runnel	2	87	x 3.3	0.56	x 2.0
Creek	3	26	x 3.3	1.12	x 2.3
Stream	4	8	x 2.7	2.56	x 2.2
River	5	3	x 3.0	5.76	-
Estuary	6	1		-	
Average			(≈3.0)		(≈

(Modified after Tweadie, *Water and the World*, Thomas Nelson, Australia, 1975.)

Dendritic branching

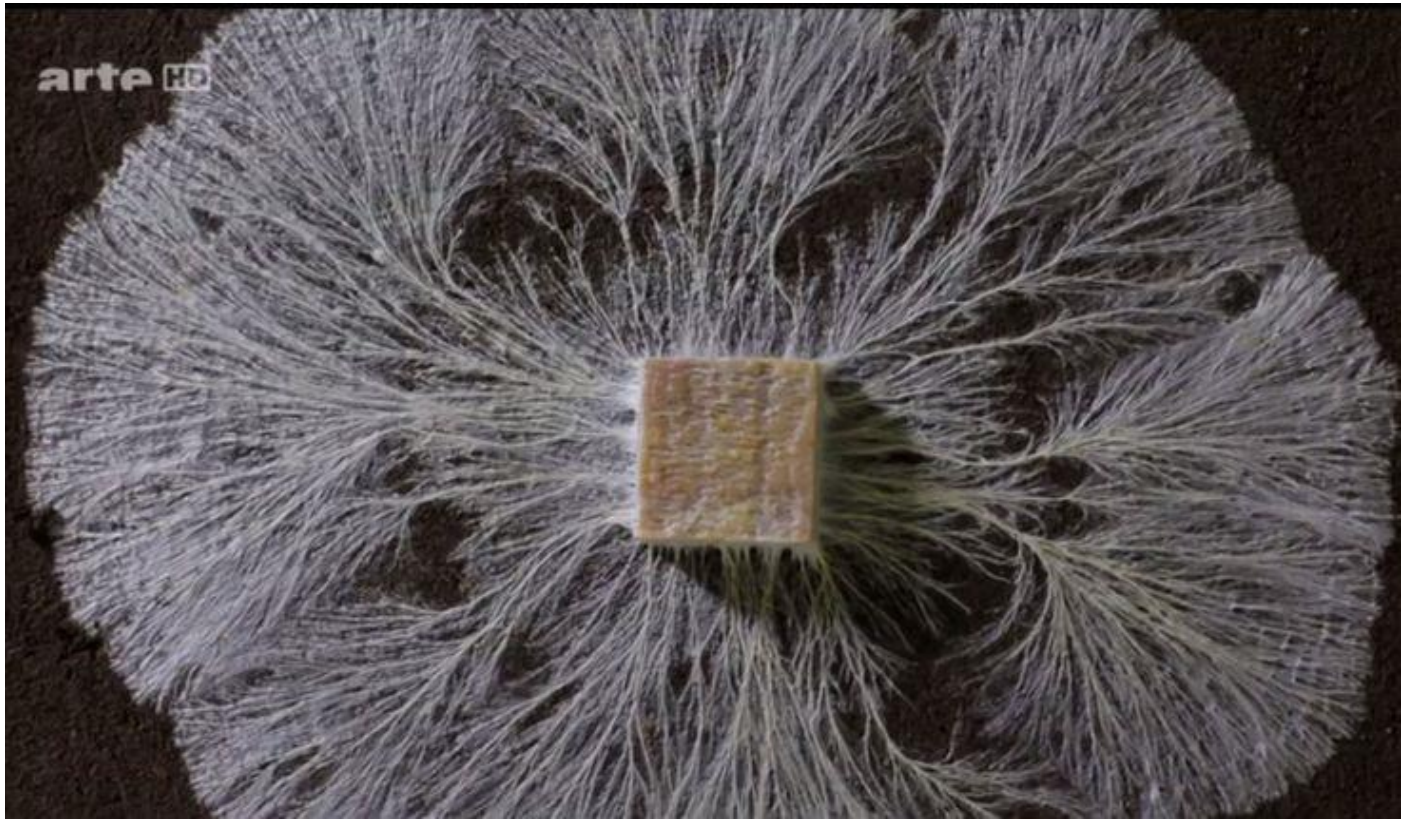
- Tributaries of a river system
- Branches of a tree
- Bronchioles in lung tissue
- Pattern of dispersal or collection

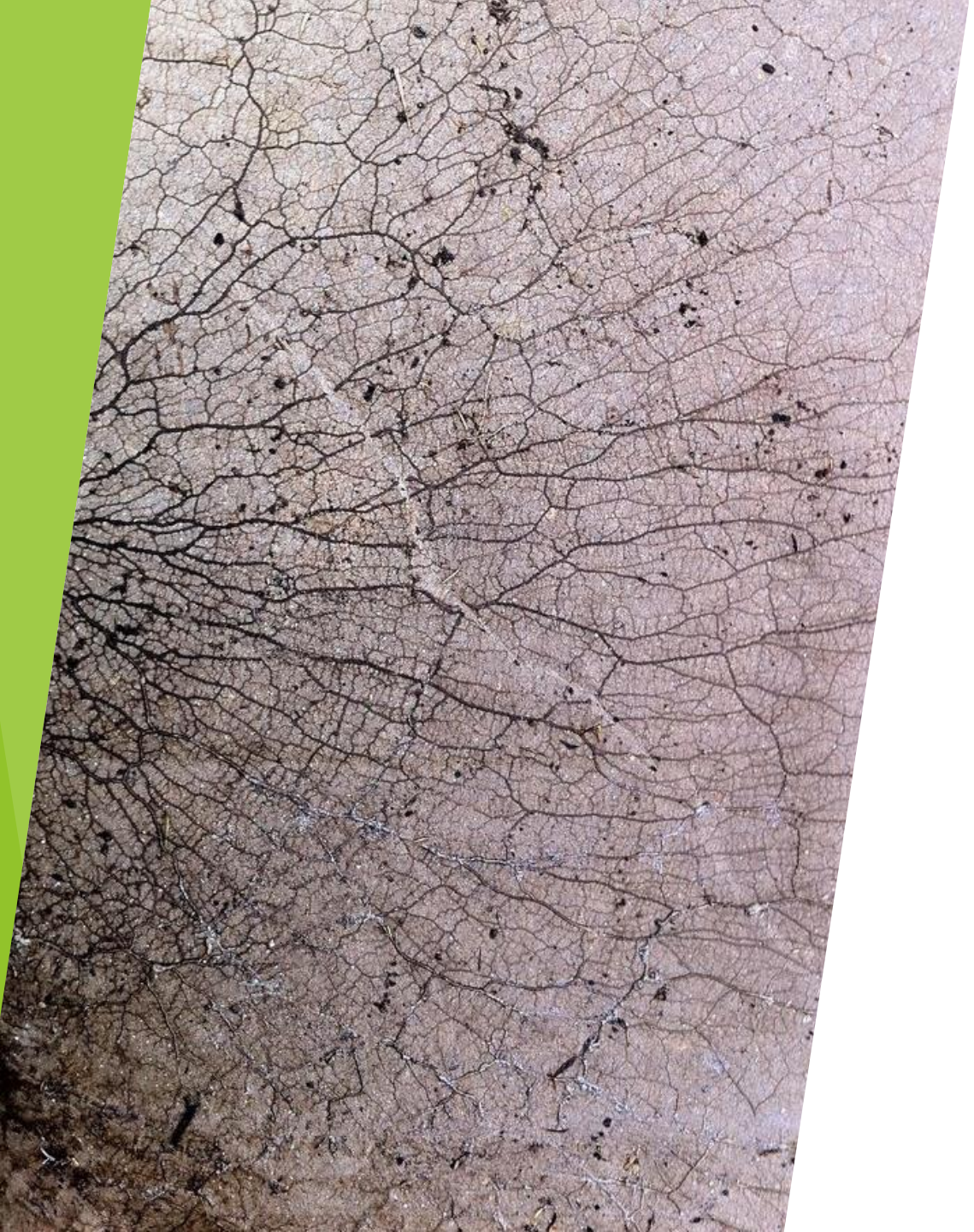
Scatter pattern

- Random
- Explores new opportunity
- Saturate with seed
- allow natural selection to prevail

Web

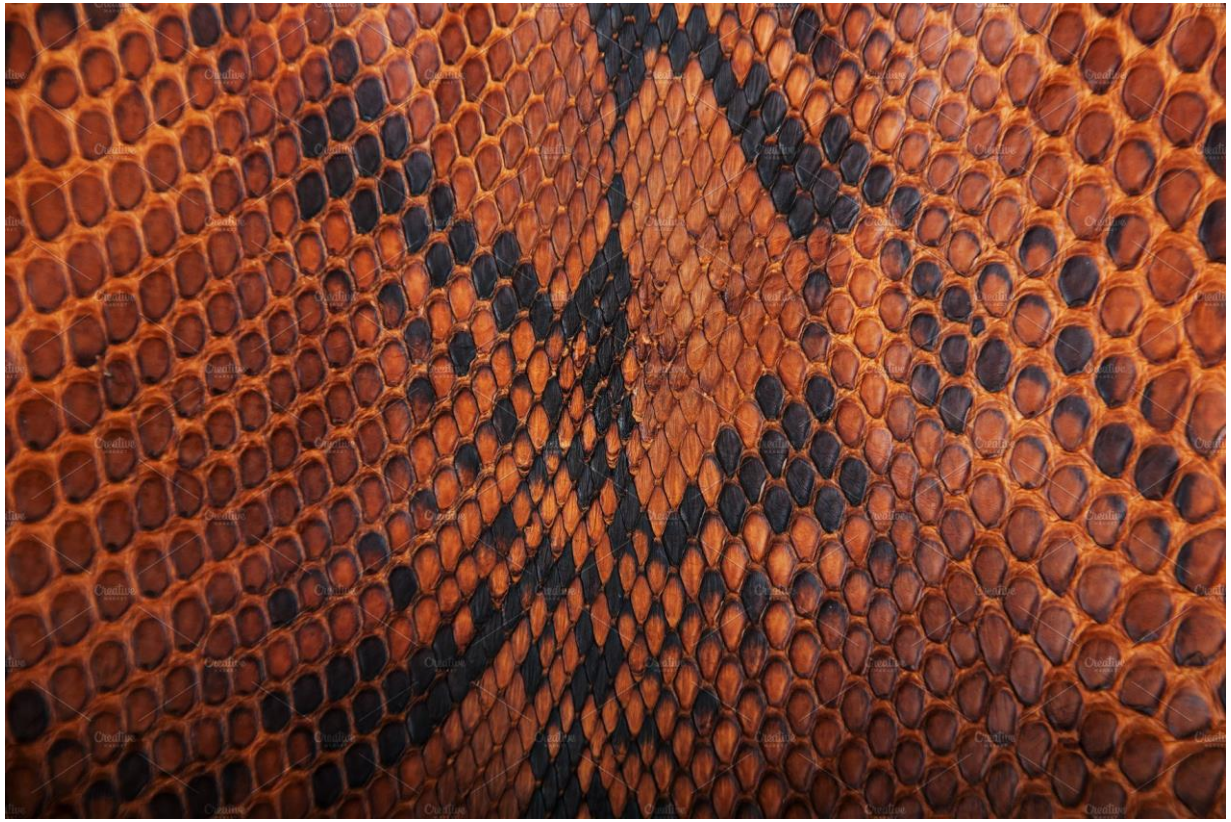
Mycelium





Mycelium on paper

Snakeskin



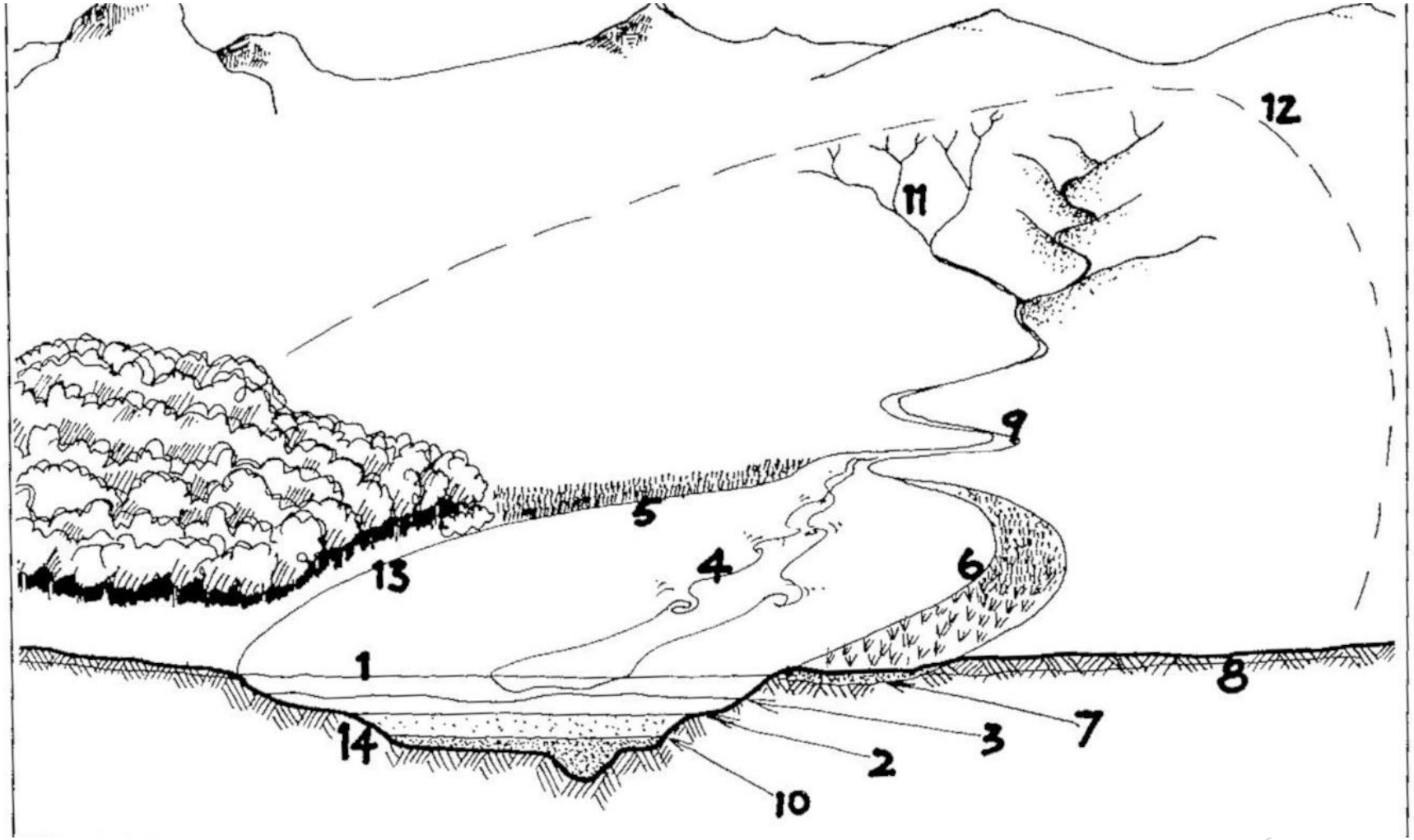
Chameleon

Fungi

Chalk

Bracken

Edge effect



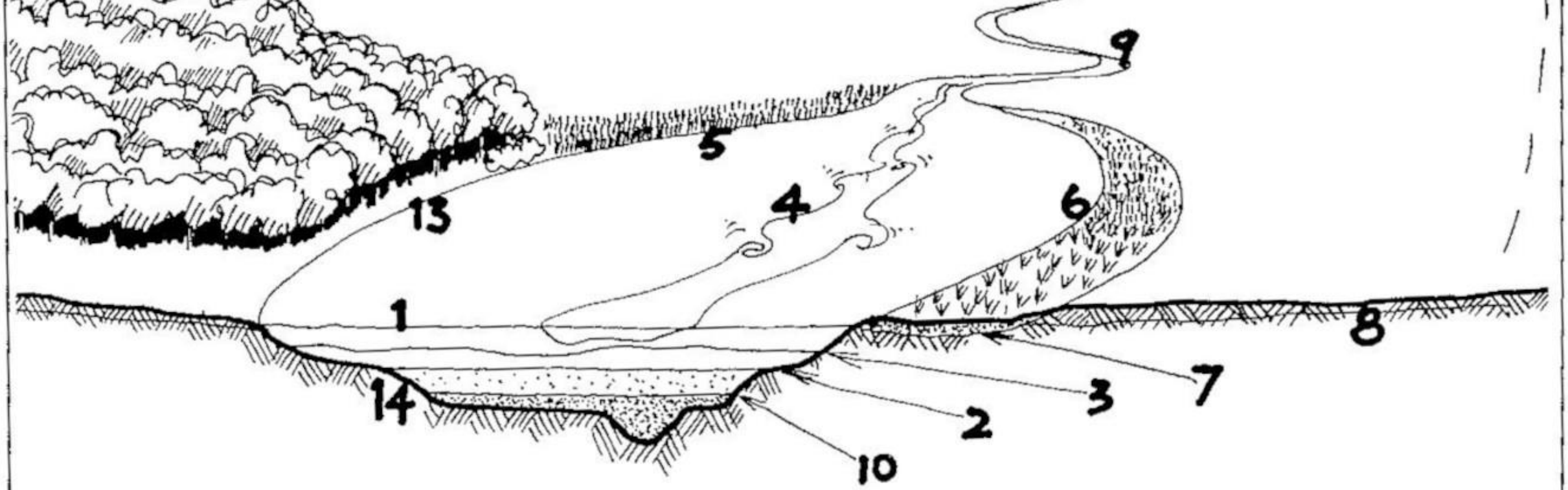


FIGURE 4. 6
EDGES AND SURFACES.
We can distinguish between many conditions or forms of media (air, water, earth, mud), physical conditions (flow, heat, salinity), and we can manipulate adjacent systems (forest, water, crop, grassland, gravels) to produce landscapes rich in borders, hence species and niches.

1 air/water	2 fresh/brackish	3 warm/cool
4 flowing/still	5 grass/water	6 marsh/water
7 anaerobic/subsoil	8 soil/subsoil	9 stream/bank
10 brackish/salty	11 stream order/sub order	
12 catchment/catchment	13 forest/water	14 water/mud

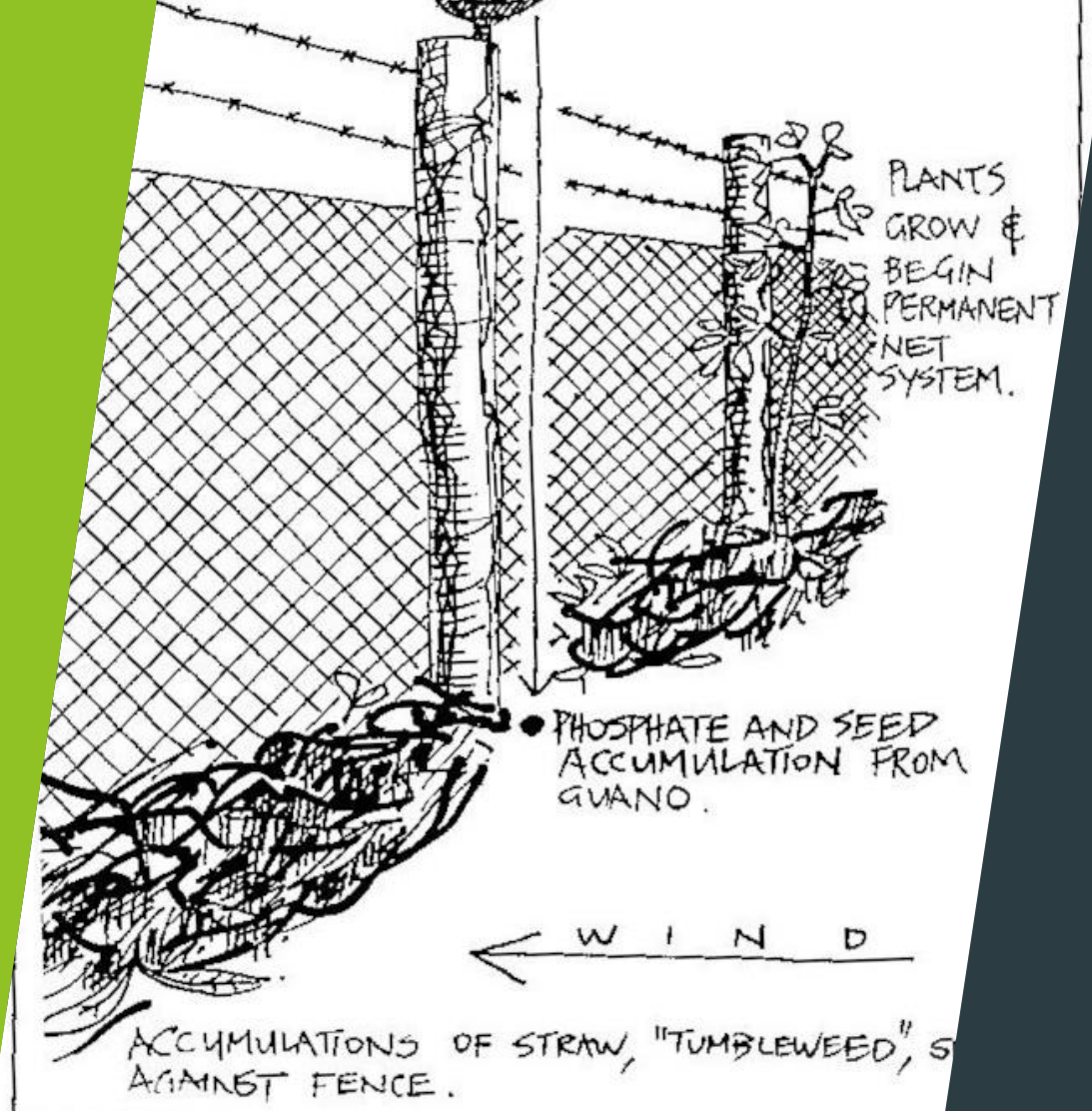


FIGURE 4.9
At powerlines and fences, perched thrushes and wood
defecate, so that each post gains seed and manure, and
generate a plant from nearby forests. Perches plus dist
produce this result. Fences also act as mulch accumulat
wind.

Edge effect

- Compatible and in compatible borders
- No difference in yield or stability
- One benefits at expense of other
- Both benefit
- One benefits, one unaffected
- One decreases the other unaffected

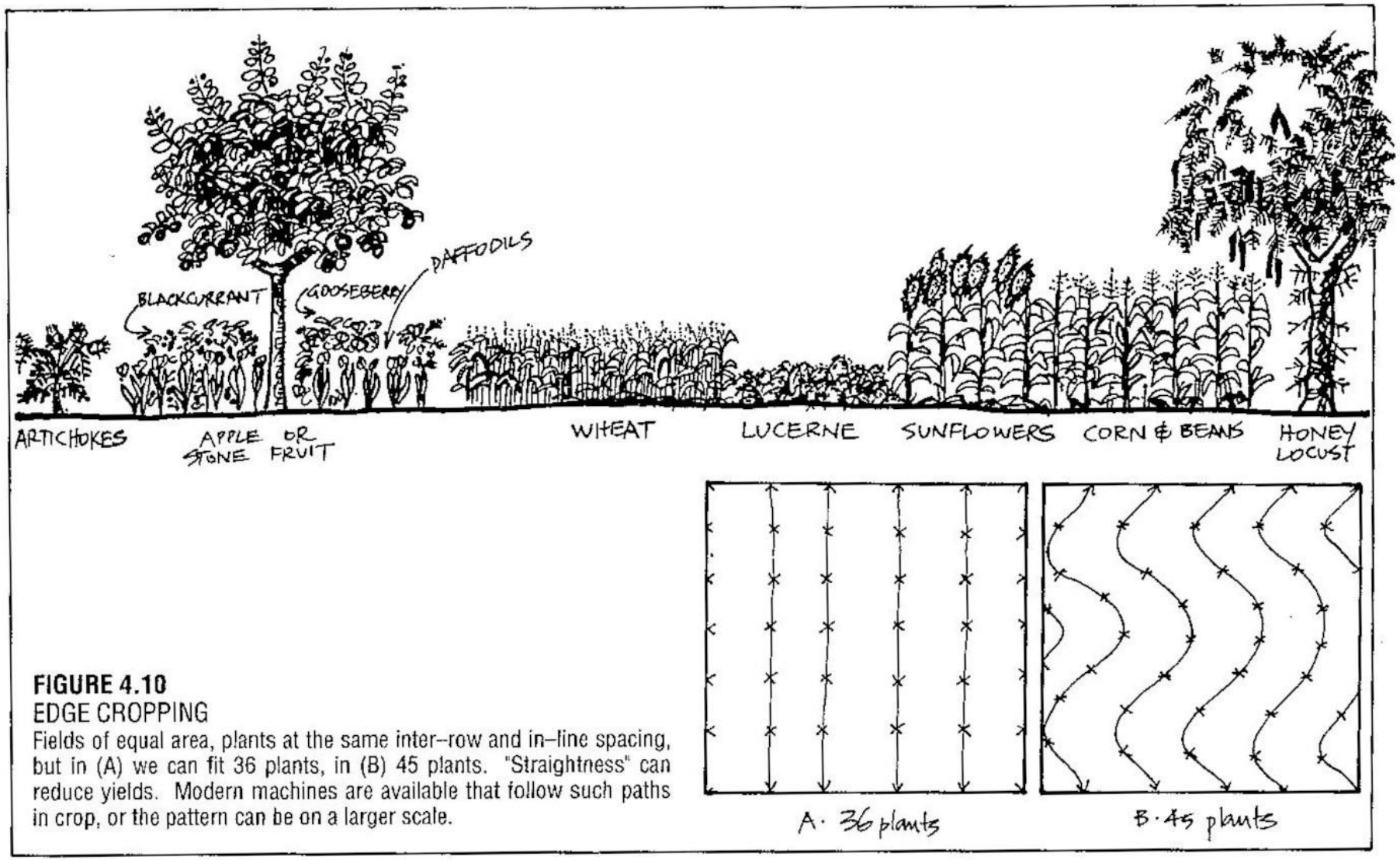


FIGURE 4.10
EDGE CROPPING
Fields of equal area, plants at the same inter–row and in–line spacing, but in (A) we can fit 36 plants, in (B) 45 plants. "Straightness" can reduce yields. Modern machines are available that follow such paths in crop, or the pattern can be on a larger scale.