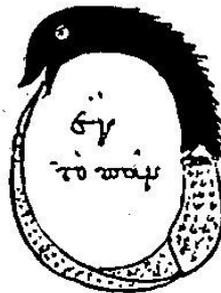


# ATUM to ATOM

## Book 4: Plants, Planets and Insects

Asia Shepsut



© Text and picture research Asia Shepsut  
please use the Feedback section on [www.cosmokrator.com](http://www.cosmokrator.com) for permission to quote  
[NB: Pictures are scrapbook quality only, for reference use]

**Definition: ATUM is the ancient Egyptian Invisible Divine Power beyond All Gods**

**2014**



***Frontispiece: Earth, Air, Water, Fire and Aether embodied in Life***

***WOULD YOU LIKE A COPY OF THIS BOOK?***

This book can be read on-line, but cannot be printed by you. You can order a hard copy from the shopping list accessed from the Cosmokrator Home Page (or e-mail me to order one). Great care is taken to make a good quality copy, saving you the high cost of paper - and colour toners (there are many colour pictures).

*Suggestions for inclusions, amendments or corrections are welcome, and should be sent to [asia@cosmokrator.com](mailto:asia@cosmokrator.com).*

***Title and Contents pages: The Ouroboros Symbol***

The *Ouroboros*, - the snake eating its tail - represents the seamless continuity of the Universe, the reality beyond the illusion of a beginning and an end. In our books it stands for the meeting of Ancient with Modern knowledge, and encapsulates the idea of recurring octaves in cycles – *the one on the title page is taken from an Alexandrian Gnostic manuscript with the Greek inscription 'All is One', whilst that on the Contents Page twists into the symbol for infinity*



# CONTENTS

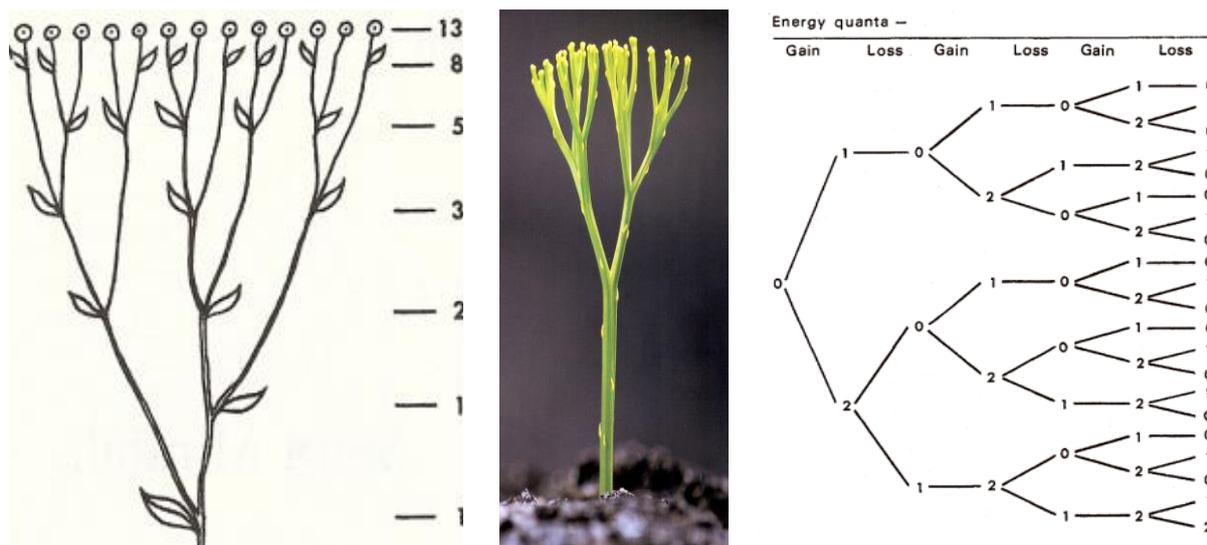
PLANT GROWTH AND THE MOON	5
THE MASTER PLANT OCTAVE	10
THE PLANT RANGE AND ITS MUSICAL STRUCTURE	13
CROSSING BOUNDARIES: PSYCHOTROPICS	17
FLOWERS AND THE NAMING OF PARTS	19
HEALING WITH FLOWERS	23
ROOT, STEM AND BRANCH	26
PHYLLOTAXIS AND BRANCHING	28
BRANCHING HIERARCHIES	30
HERBS	32
LEAVES	33
THE SUN AND CHLOROPHYLL – and other Planetary Influences	36
PLANTS AS CHEMICAL TRANSFORMERS AND CARRIERS OF THE ELEMENTS	38
ZODIACAL CLASSIFICATION OF THE ENTIRE PLANT WORLD	42
PLANTS, PLANETS AND SIGNS	43
HAUSCHKA on PLANTS, PLANETS AND SIGNS	49
THE PLANETS IN FARMING AND GARDENING	50
THE ANCIENT WORLD VIEW	52
BIODIVERSITY	54
THE PLANT-INSECT INTERFACE	56
APPLYING THE KNOWLEDGE	61
SEX, FRUITS AND SEEDS	64
OPENING OUT TO NATURE, AND A NEW KIND OF GARDENING	68
CONCLUSIONS	71
A MEETING WITH THE GREAT GOD PAN	73
APPENDIX A: YOUNG’S FAVOURED PLANT CLASSIFICATIONS	76
APPENDIX B: WORLD DISTRIBUTION OF NATIVE USE OF PSYCHOTROPIC PLANTS	77
APPENDIX C: THE CARBON-HYDROGEN-OXYGEN TRIAD IN PLANT-RELATED COMPOUNDS	78

## THE COSMIC ROLE OF PLANTS

Key numbers: 18/19, 27-30 (The Lunar Cycle)

### AIMS OF THIS BOOK

This book does not pretend to be factually exhaustive, since science already covers the infinite detail of the plant world comprehensively – it is more an essay aiming to cultivate an *attitude* that seeks to look within root, stalk, leaf, flower, fruit and seed for their hidden principles - and encourage a view of the simplicity underlying the bewildering mass of botanical classification in all its tomes (see *Appendix A*). As in previous books we take as our banner the ouroboros symbol to justify a view of both ancient and modern ways of looking at the vast universe of plant life and what it can give and show us. Leading on from the last book on atomic structure, as a starting point, look again at the illustrations from it (below left and right) showing the same musical branching structure in subatomic energy ratios as seen in plant growth: both follow the Fibonacci series, and indicate how the Periodic Table itself could be rearranged!



**III. 4- 1: Phyllotaxis in Fibonacci branching – and Electron and energy exchanges between Hydrogen shells – Huntley fig.12.2**

I would like to think that after reading this short booklet we will be in a position to better match our intellectual knowledge about plants to the individual examples we come across in our daily lives, and start tuning into them at a more refined level – certainly to treat them more sensitively. This opens the door to a more multivalent and beneficial effect on us in return. In fact I began writing this book during the week of the Chelsea Flower Show in London where several of the most admired gardens centred on their role in healing mind, soul and body – not only of war-shocked soldiers or terminally ill patients but also ordinary people sustaining the undermining stresses of every-day modern life. The booklet (as all the others) can also serve as teacher’s course notes and/or pupils’ text book. It provides a bare outline on which users can build by inserting their own pictures, observations and experiences at relevant points.

### **PLANT GROWTH AND THE MOON**

Plants occupy that sub-lunar world growing beneath the Moon but rooted in the Earth (see our frontispiece): they literally clothe the Earth, providing not only vital habitat for animal worlds on several octaves of organic life, but indeed through photosynthesis create the very atmosphere it breathes. In the domain of plants we are aware not so much of technical geometric structure as a seemingly rambling, fluid world that masks it, ringing its changes in every possible combination. We need not spell out again the principles explored in our books so far on the plain numbers behind resonance and musical ratios: taking them as now read, with our new X-ray vision we could find ourselves sitting in the garden for hours watching how that hidden music plays out in a variety of ordinary and extraordinary ways in stalk, leaf, flower and fruit. What is more, these structures are obviously imbued with Life itself – that factor that makes all the difference between an artificial silk flower and a real perfumed rose, or fake plastic bamboo and a living, air-cleansing bay tree welcoming you at a shop entrance.

The connection between the Moon and plants was well-known in the ancient world: on Sumerian stone reliefs, paintings or seals, the Ruler and Moon Priestess are portrayed enacting the annual spring ritual of watering the palm shoot before the Moon God at the temple gates.



**III. 4- 2: The ancient connection between the Moon and plants in 2M Mesopotamian art: (left) Wall-painting from Mari showing the ritual plant representing nature watered by the Ruler before the Moon God; (right) Ur III period seal, Rosen Collection – Klengel-Brandt<sup>1</sup> fig. 84**

Because the Moon is also involved in the female menstrual cycle, female reproduction and plants were both seen to come under the same Moon measures. There is much to ponder for ourselves as to what Moon awareness and practice we might revive in our own approach to gardening. Certainly there is much ancient folk-lore about planting at the full moon and harvesting on the waning moon, but few rural communities these days keep to this rhythm since most indigenous farming has broken contact with ideas of working with the cosmos – other than with the Sun of course, whose influence perpetually happens - with or without human cooperation. A newspaper story printed in the USA on October 5 1963 ran as follows:

<sup>1</sup> E Klengel-Brandt (ed.) **Mit Sieben Siegeln versehen** Berlin 1997

*WASHINGTON – Science has come to the support of farmers who for centuries have insisted it was best to plant crops during a New Moon. Dr Geoffrey Keller... told a House Appropriations subcommittee that research at New York University indicated farmers might be right in believing crops grow better if planted during a New Moon. Researchers, after poring over weather records going back 91 years, discovered that the chances for heavy rainfall in the week after New Moon and Full Moon were up to three times greater than for the week preceding the New Moon.*

A lovely example of the potency of such timing is given by Louise Riotte in her book, *Planetary Planting*, where she describes the erection of a wooden fence around the vegetable plot: 'Fence posts 'planted' in the increase of the Moon and in a moist or water sign have been known to sprout leaves and eventually grow into trees!'

At the turn of the century and into the 20C, L Kolisko and Agnes Fyfe of the Anthroposophical movement founded by Rudolph Steiner took on a more scientific approach to try and prove precisely how each planet plays its part in plant growth. Moon measurement involved measuring the progress of plants sown or transplanted at different Moon phases, noting the daily rise and fall of plant sap within plants picked on different days of the month, made visible

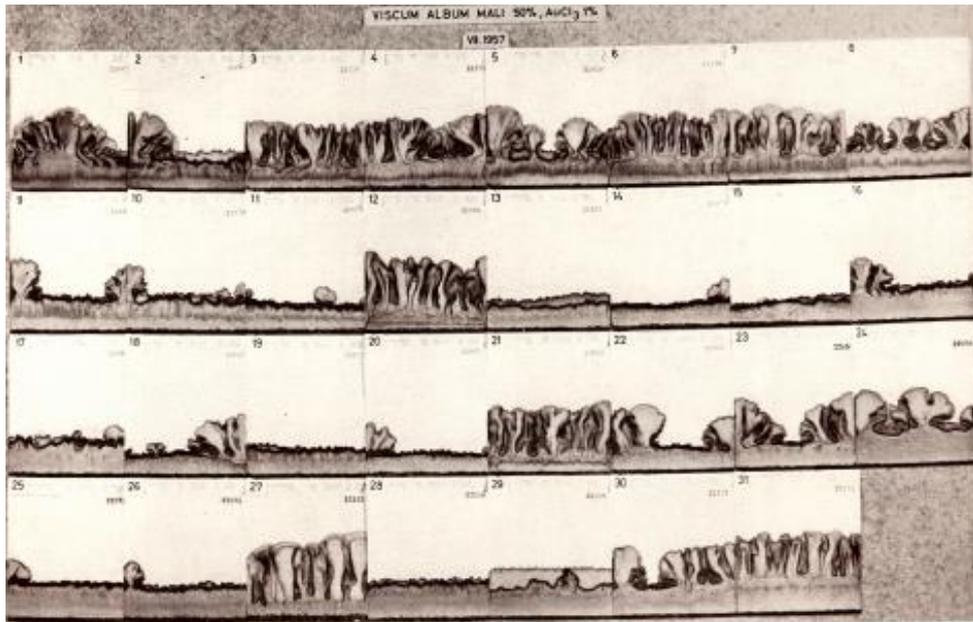


**Ill. 4- 3: The rise of mistletoe sap made visible by gold chloride - Kolisko**

by coloured chemicals such as gold or silver nitrates or chlorides. Such experiments had to be done over many years in order to pin down exactly the nodal points of influence, not only of the Moon, but also of the other planets which also played their part (we consider these later). The results for the Moon were particularly useful, and quite complex, as follows.

Given plants are mostly water, it is not surprising that the effects of the phases of the Moon will be appreciable, since not only does the Moon's phase and position in relation to Earth affect the rise and fall of the ocean tides, but also any body of water - including the fluids of the animal world and the sap of plants. Because the Moon is nearer the Earth than the Sun its gravitational pull has a dramatic effect, even though still weaker than that of the Sun. As it passes over Earth it pulls the nearest water off from the earth beneath it and also pulls the Earth as a whole slightly away from any ocean on the far side. The resulting tides travel around the earth following the path of the Moon, as do fluids in all water-bearing organisms on land, most notably plants at all stages of their development.

In germinating seeds moisture is all-important. The full Moon causes soil moisture to rise closer to the Earth's surface, where newly planted seeds or plants can take full advantage of it. Kolisko was among the first to systematically show under scientific conditions how the influence of the Moon works. Seedlings planted in the waning Moon were puny and undeveloped in later life compared to the full development of those planted in the first, waxing half of the Moon (her result for sap fluctuations for the month of July, below, speaks for itself). However, if the soil is

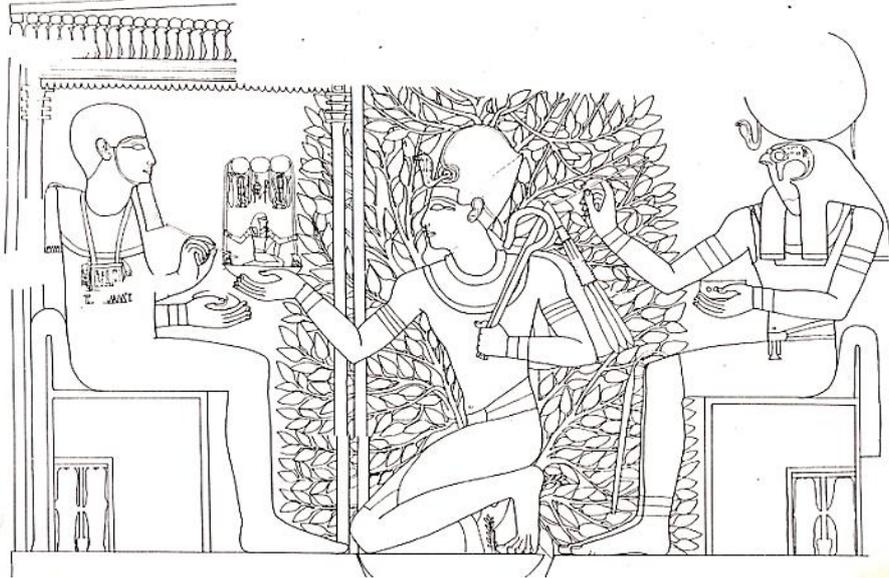


**III. 4- 4: Rise and fall of mistletoe sap for 1-31 July 1957 – from Fyfe, MOON AND PLANT 1957**

dry during the full Moon it will not be able to exert its full influence, given it acts through moisture. However, other researchers later found too much watering during the full Moon gives rise to blowsy fruit with reduced keeping quality and weak germinative vigour in seeds. Overriding the Moon's dark and light fortnights is an overarching mega-cycle in the Northern Hemisphere of flourishing plant growth from Spring Equinox to Autumn Equinox and a decline, even during waxing Moon periods, in the second half of the year (vice versa for the Southern Hemisphere). Thus, even during the waning Moon phase just preceding the Spring Equinox, growth surges strongly in all Moon phases.

Agnes Fyfe, building on Kolisko's work, tried to show that it is the Moon that is responsible for the actual formation of the plant through its pull on the sap, and that its formative influence is checked when it is further away from the earth at full and new Moons, or during lunar eclipses and in the middle of total solar eclipses. If we consider that the Moon is the crucial factor also in the reproduction of human babies, it would seem certainly that it is the Moon influence that *nurtures* the reproduction of all the emergent forms as they fulfil the patterns already encoded in the genetic combinations in germinating seeds, but strictly speaking shaping itself is the cooperation of the Moon, via water, with Vulcan the form-making planet - in the Cosmokrator

scheme of things the true ruler of Virgo. The fresco below shows Pharaoh Seti I against a leafy bush, holding up to the enthroned Ptah/Vulcan a tiny model of the human form with a staff in each hand (the symbol for 'millions of years') the forming of both of which Ptah is the architect:



**Ill. 4- 5: On a wall-painting from his funerary temple at Abydos (19D) Seti I, endorsed by Horus, requests Ptah's everlasting good offices**

As we proceed step by step we will come to realise in full the extraordinary role the plant world plays in mediating between sky and earth, to the benefit of the animal world.

The mega-lunar cycle with all possible combinations of its influence over large numbers of years, which includes its crossing of the Ecliptic at eclipse points until it comes round again to new Moon at exactly the same stellar point in the sky - takes nineteen years (the Saros cycle), so there are refinements of plant success or failure from year to year within this grander sweep, since the Moon on the same day in another year may be in a different Sign, its channelling altered due to the varying stellar influence that it channels.

Maria and Matthias Thun, also Anthroposophists, confirmed Kolisko's work and took it further, publishing an annual planting calendar for gardeners from the 1970s onward. They found that eclipses and the Moon's perigee and apogee affected the germinative qualities of the seeds of plants sown or transplanted at those periods quite adversely, sometimes causing sterility: if grain for human consumption, it would have little nutritional value. They discovered that seed sowing or plant transplanting was most beneficial during the waxing Moon, especially if it was in the same or well-aspected Sign of the zodiac as the Sun, whilst gathering harvest or pruning was best done in the waning phase of the Moon when sap was not rising but dormant and sealed off. The only plants that should be transplanted in the waning phase are shrubs and trees because there is the least danger of sap loss. On the other hand it is during the ascending Moon when sap is rising that cuttings should be taken or Christmas trees cut to last the full period of the season,. It all sounds like common sense, but how often does the ordinary

gardener look up to the Moon in the sky and factor it in to their garden activities today? This is a basic change to make in your gardening awareness! The Thuns take the constellation against which the Moon is moving as further factors to be taken into account. The Moon of course runs through the entire zodiac every 27/8 days and funnels the qualities of the higher principles from any Sign through its own wateriness down to the plant world (we look at specific zodiacal influences later). Their basic rule of thumb, sufficient for an initial understanding here, is that sowing or transplanting of plants grown for their leaf quality should be done when the Moon is in the water signs, for fruit-bearing plants in the fire signs, for outstanding seed quality in Leo, for root vegetables in the earth signs and for flowers the air signs (though I would see the fire signs as paramount for flowers too – but see what you can observe for yourselves).

It is the growth of vegetables which can be noted particularly easily as ruled by the Moon, best watered when the Moon is in water signs as their absorption rate is improved. Spraying against pests (natural sprays such as nicotine, mustard, pyrethrum or soap) is said to be best done under the dry signs of Gemini, Leo or Virgo, so that the effectiveness of the substance does not run off. However, to become truly organised in gardening, by working with the Signs with all kinds of plants, one needs to be a full-time gardener with the proper astronomical information – fortunately every year the Thuns and their heirs still publish their planting and growing calendar for the year ahead. Probably the average gardener can only cope with Moon cycles, whatever Sign it is in, and this is sufficient to get most of the way with tolerably good results.

What has also been demonstrated by the Biodynamic Movement and the official Organic Movement as a whole (led by the Soil Association) is that if the soil itself is right, then adverse planetary conditions are abated and favourable ones enhanced. There is no getting away from the scene of a farm or garden providing, with good husbandry, what the rain forest does naturally, plenty of rotting vegetation and animal droppings kept in the dark with hundreds of the right creeping beasties threading through it to decompose it and form it into the humus that makes sustaining soil. The octave of plant life interplays with planetary harmonics from above with Sun and Moon as principal notes, and from below with the harmonics of healthy soil, made from its own decayed structures: the dissonance caused by chemical fertilisers and the horrendous depletion they ultimately cause has all too often been described, and it is astonishing that the majority of farmers (who by definition should know about healthy soil and crops) are taking so long to reawaken to the age-old lore of natural harmonics. The end of the Second World War in Britain was the turning point for agriculture's adoption of chemicals and factory farming, and only fifty years later did its disastrous consequences come home to roost. Now the tide is turning back to the natural, but it is a long and slow process without immediate returns as Earth and plants stagger to recover. Due to the pressing needs of food supply for its 8 billion inhabitants, the divide between the two kinds of farming will continue to widen.

### **THE MASTER PLANT OCTAVE**

Only the true teacher or researcher can direct us into the hidden cosmic music that shapes plant life according to the environment it has to cooperate with, a process D'Arcy Thompson summarised as 'growth and form'. We look at this idea simply, then in its detailed complexity. It is the plant octave that Goethe, Rudolf Steiner's great inspiration, described as the *Urpflanze*,



**III. 4- 6: Corn Poppy from Gerard's Herbal showing the basic octave from root to fruit/seed** or *Master Plant* - the *Plant Prototype* - which exists in virtual reality *as a plan* before it manifests in its countless variations of tree, bush or grass, as determined by its specific gene structures. To give us the main framework for this booklet, let us take an overview of the average plant life-cycle and its parts that hold good whatever the variations of shape and size.

At the turn of the 19C Goethe recognised that plant development follows a three-phase cycle of expansion and contraction pairs: the expansion of initial foliage followed by contraction into calyx and bracts; expansion into the petals of the flower and contraction in the meeting point of stamen and stigma, and finally the swelling of the fruit followed by contraction into seed. If we add germination of the first root and ensuing root formation as the first expansional stage at the beginning of a plant's life – and death at its end as the final contraction – we have the full octave for the Master Plant, not difficult to see.

Ernst Lehrs viewed such plant stages in terms of levels of sacrifice versus growth: leaves losing their vitality to allow flowers to develop, and flowers dying so that seeds can form. Miraculously, the seed contains all the elements necessary for the reiteration of the octave, from root to leaf to flower and fruit stages - and back again to seed. If you have ever had to prune back and weed an unruly garden, the thought might have crossed your mind many times: 'where on earth did all this vegetation come from?' It appears to have come from nothing: you sowed a handful of seeds - in spring and summer there was a profusion of flowers and in autumn baskets of fruit - and by the winter you have filled bags and bags of leaves and prunings to put on the compost heap - all that manifestation held invisibly inside the seed after growth interactions with minerals, planets and Signs which we will detail below. Again it is the



**III. 4- 7: The most common pollinators of flowers apart from the wind are insects**

Germans - usually inspired by Goethe and Steiner - who devised an agricultural method for gaining optimum performance from plants as reduced to compost - and from new plants grown in it - by considering the particular connections with planets, stars as well as the microstructure of the soil (they called it Biodynamic farming). We will describe their method in due course.

The fact that the same plant results from the same seeds time after time, following the same laws of unfolding, Rupert Sheldrake<sup>2</sup> attributes to morphic resonance - his name for the plant 'memory' surviving within the musical arrangements of each seed - absorbed, he believes, from succeeding encounters with the outside world rather than from the eternal principles posited by Pythagoreans. This 'memory' he sees as amounting to the combination of musical notes that create such proportioned structures given music is the original formative resonance. It must surely be a combination of the two, a dialogue between *Urpflanze* and local conditions as it adapts to and draws on them. Scientists who dismiss the idea of morphic resonance are simply looking at the structural codes of genes without taking the further step of tracing them back to musical notes: both sides of the debate are on to different levels of the same truth. Sheldrake

<sup>2</sup> *A New Science of Life: The Hypothesis of Formative Causation* 1981, reprinted as *Morphic Resonance: The Nature of Formative Causation* 2009, and *Presence of the Past: Morphic Resonance and the Habits of Nature* 1988, revised edition 2011.

from early on courageously put his career on the line by taking on scientists *using their own methods of proof* and subjecting life processes to laboratory conditions. Sheldrake was one amongst a stellar group of intellectuals who wrote contributions for the New Age magazine published in California, *ReVision*, whose aim was to try to bridge the gap between science and the arts in the light of the Berkeley Campus upheaval of the Sixties. These led to his earliest books<sup>3</sup> (continually in print since) demonstrating that far-reaching awareness is a normal faculty in plants and animals but deadened in modern urban man. He demonstrated through simple experiments how all life forms are interconnected in extended memory fields stretching not only to great distances spatially, but also far back in time. He showed how resonance operates in simple everyday life situations (detectable without needing drugs!) in plant, animal and human interaction: wild birds sense straight away, for example, when a human, or animal predator, is staring at them. I have found that I prefer to hear him speak than read his books since I don't need to have such matters laboriously 'proved' to me – it is the scientists his books are aimed at (the very people who won't read them)!

Lehrs considered the transformations of the plant in its successive phases of contraction and expansion stages as parallel to those of the caterpillar from egg, then chrysalis to butterfly. In

<b>PLANT</b>	<b>BUTTERFLY</b>
Flower	Butterfly
Bud	Chrysalis
Shoot	Caterpillar
Seed	Egg

**III. 4- 8: Parallel plant –v- insect stages of transformation)**

this book, inasmuch as they are a crucial factor in the success of plants, we cannot avoid taking insects as part of plant life (see *III. 4- 58*) whether as butterfly, bee or ant - though on occasions certain reptiles, birds and small mammals also play a part in pollination or as seed carriers (the vampire bats of Mexico which pollinate the blue agave (the tequila plant, vital to Mexico's export economy) have recently been saved from extinction by Rodrigo Medellin).



**III. 4- 9: The interface between plants and insects often extends to small animals**

---

<sup>3</sup> *Seven Experiments that Could Change the World* (1994) and *The Sense of Being Stared At – and Other Aspects of the Extended Mind* (2003)

### **THE PLANT RANGE AND ITS MUSICAL STRUCTURE**

Not many realise plants, as well as being musical in form, can even *feed* on music, growing badly when surrounded by pop music and proved in experiments to flourish under the strains of Mozart, meaning the music corresponds to - or conflicts with - the plants' own harmonic structures (surely a warning to humans about the effect of music on them too – and why Plato would admit only the noble modes in his Republic). Conversely, plants give out communicative sounds of their own – both background music and distinctive messages - such as when they need water, 'screaming' if damaged. They have their own fields of resonance that interconnect with those of other plants and insects in the vaster octaves of Planet Earth. Dramatically, Tompkins and Bird showed in their 1970s bestseller, *The Secret Life of Plants*<sup>4</sup>, how they emit fields of sound as they sway within the vaster morphic fields of all cellular life and thought forms. More remarkably, they react to the emotive side of thoughts in humans, recoiling when they sense someone intends them harm, and can pick up the 'vibes' of someone who is lying. Plants attached to electrode graph equipment also emit reactions to death or harm to any kind of cellular structure – the killing of a fellow plant, the cracking of an egg, or a human cutting their finger. They are in fact so true to thought fields that they can betray a criminal in a group, remember a particular person who has hurt or loved them in the past, react to their owner's emotional ups and downs even at many miles' distance, and in general absorb the ambience of the ethos in which they are placed.

Such experiments show how plants bestraddle that connective layer between the physical, psychic and mental worlds - and on a grander scale relay the influence of the planets which help form them in the first place – in particular the Moon (in horoscopes associated with the emotions). They are of course reactive to whatever the Sun does, but also amplifiers of all other planetary and zodiacal influences raining down on earth (itemised shortly). Plants have been known to pick up interstellar signals which scientific instruments have not been able to detect, providing a biosignalling potential which has barely been tapped so far. Without needing to go into the numbers of it, we can accept the general premise that, in the scheme of the laws of correspondences, plants are conductors of high importance in connecting upper and lower worlds. Tables of correspondences between plants and planets survive that go back to ancient Mesopotamia - in *Book 7A* on the *Babylonian Theory of Correspondences* I reproduce a clay tablet written in cuneiform that gives the plants for each Sign of the Zodiac (the main problem being how to translate these plant names into their present-day equivalents!).

All this means that being surrounded by vegetation is crucial for our mental and physical connectedness (see under our final *Conclusions* at the end of the book). Vegetation is a silent presence keeping the world alive in a whole universe of sensitive signals, if we would only

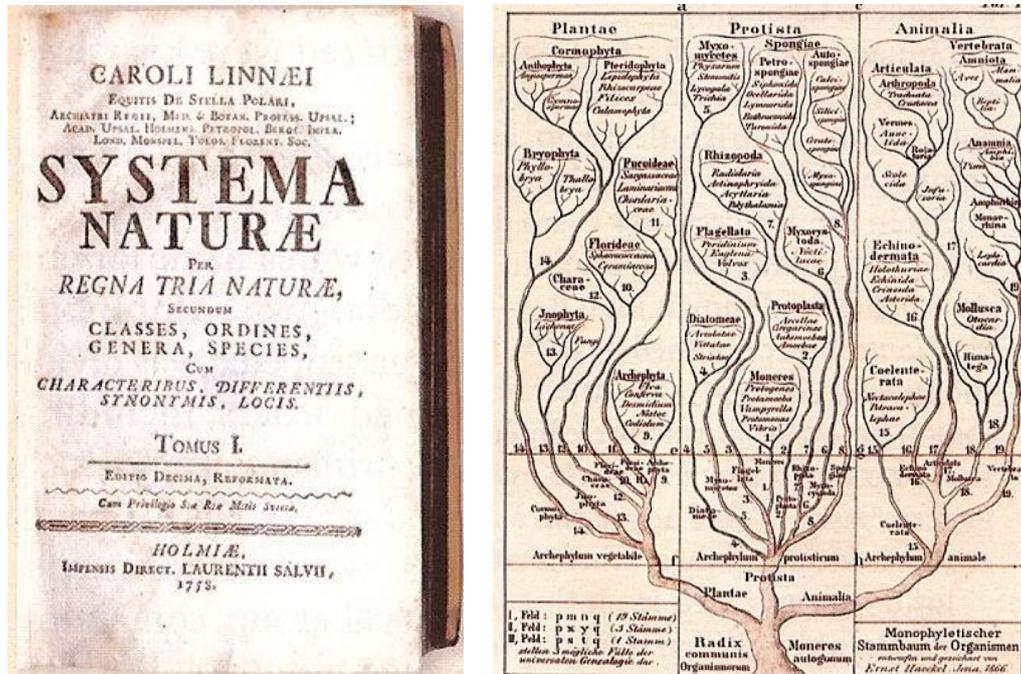
---

<sup>4</sup> Peter Tompkins and Christopher Bird *The Secret Life of Plants* first published in 1973, always in print thereafter.

deign to pick them up – better than watching television all day, and definitely light-years more subtly life-enhancing than constantly being on earphones on the stream of musical and TV downloads that screen out all their high-octane music. As Backster, the experimenter quoted in *The Secret Life of Plants* who built up an astonishing relationship with his philodendrons wrote, 'Sentience does not seem to stop at the cellular level. It may go down to the molecular and beyond. All sorts of things which have been conventionally considered to be inanimate may have to be re-evaluated' (when his first article was published in *The International Journal of Parapsychology* in 1968, over 7,000 scientists wrote to ask for reprints). In fact it was Sir Jagadish Chandra Bose's work on plants that had originally pointed the way in modern scientific terms to how sensitive plants are. We perhaps associate him most with Bose Sound Systems today, but in fact he was one of the first Indian scientists using Western methods who proved electronically how sensitively plants react to all kinds of external stimuli. He invented an instrument he called the Crescograph which could record and observe their minute responses by magnifying the motion of their cells to about 10,000 times their actual size, demonstrating, for instance that plants feel pain, quivering if injured. His books include *Response in the Living and Non-Living* (1902) and *The Nervous Mechanism of Plants* (1926).

An instance of how plants show emotion came up with a Japanese researcher, Professor Hashimoto: in devising a way of using plants as a lie detector, realised that he could also try to interact with the plant (a cactus) himself, and read off its reactions as electronic impulses – but failed to get anything. Passing the job over to his wife, something quite different happened. 'As Mrs Hashimoto assured the plant that she loved it, there was an instant response from the cactus. Transformed and amplified by Dr Hashimoto's electronic equipment, the sound produced by the plant was 'like the high-pitched hum of very high-voltage wires heard from a distance, except that it was more like a song, the rhythm and tone being varied and pleasant, at times even warm and almost jolly'. Vogel, another experimenter quoted in *The Secret Life of Plants*, realised that the interchange happens both ways, and that humans can consciously work at linking in with the bio-electric field of plants, concluding that 'a Life Force, or Cosmic Energy, surrounding all living things, is shareable among plants, animals and humans. Through such sharing a person and a plant become one'. One cannot underestimate the tremendous power plants have to heal humans through such interchange - hence the trend for hugging tree trunks, let alone our usual gardening potterings or tending of an indoor plant. Ancient laws are also verified - for instance plants have energy surges at the mention, or action, of animal sex. Indeed, ancient ritual often prescribed intercourse by a couple in a field to set up a wave of general fertility in nature: the more formal sacred marriage ritual in the temples of Mesopotamia was intended to suffuse the entire country with the impetus for successful crop growth.

The most important conclusion to emerge from Tompkins and Bird's account of science's attempts to understand plants is that scientists who will not use their emotions or imagination, and who treat experiments in a robotic way, get no results! Cataloguing and measuring cannot



**Ill. 4- 10: Title page of Linnaeus' *Systema Naturae* (1758 edition) and Ernst Haeckel's *Tree of 1866* giving it visual form – see also Appendix A**

be an end in itself if it does not help to then understand the symphony of each plant form as a whole, and what it is transmitting. If only we could get Krüger to draw up the musical diagrams for the properties of key plants as he did for Chlorophyll (Ill. 4- 35) - this is as encyclopaedic a task awaiting a dedicated researcher as Linnaeus' achievement (from 1735 on) in classifying all plant types (illustration above). He made a vast contribution on the purely scientific side, though Tompkins and Bird quote Raoul Francé's famous words about him: 'Wherever he went, the laughing brook died, the glory of the flowers withered, the grace and joy of the meadows was transformed into withered corpses whose crushed and discoloured bodies were described in a thousand minute Latin terms... . When the work was over we stood disenchanting and estranged from nature'.

That difference of approach is well summed up in the contrast between Richard Dawkins' *The God Delusion* (2007), challenged by Rupert Sheldrake in his *The Science Delusion* (2012). Two incidents nicely summarise the nature of the divided worlds of scientific enquiry versus tribal knowledge though they can at certain moments cross over to their mutual benefit. It was reported in *The Fortean Times* for May 1994 that Dr Djaja Soejarto of the University of Illinois brought back some twigs of a certain type of gum tree growing in the swamps of Sarawak, then discovered they contained a compound successful in blocking the spread of the AIDS virus without damaging human cells in the process. He and colleagues boarded a plan and rushed

back to the site of the tree, only to find it had been cut down for construction purposes - and they could not find another. Other trees of the same species failed to contain that vital compound! A similar AIDS-inhibiting vine was discovered in the Cameroons by British botanist Duncan Cameron and now research continues on developing its potential. The story shows how even in the present day the huge possibilities of known or yet to be discovered exotic plants are still seen as a Holy Grail by present-day medical explorers, and is an area where ancient tribe and modern medicine meet – perhaps with one important difference. In native tribes still living at close quarters with nature, healing plants and psychotropics were used in the context of contact with the greater daevic forces pulsing through nature (see our description of the Findhorn Garden later), which because of their power were - and often still are - worshipped as Gods, whereas scientists seek to extract the active ingredient and then artificially synthesise it.

In this short-sightedness in believing itself superior, the lack of that wider connection in modern medicine too often leaves out several fields of higher healing! Take the account (reported in *The Times* of 11 October 1994) of the British commando, Bob Mann, who with his companions got lost in the jungle in Borneo and developed a gangrenous hand after a machete accidentally slashed his hand as he fell down a gully: two fingers were almost severed and there was a gaping wound on his palm. After 8 days' march they finally emerged at a local village and Mann was sure he would lose his by now swollen and festering hand. A village elder called for the local medicine woman and the old lady grabbed his hand and forced it into a large jar of what he was told was a mixture of herbs, snake flesh and bones. He said, 'It felt as though my hand was on fire [but] when she pulled it out about 20 minutes later the skin was spotlessly clean: thanks to the jungle treatment my hand was saved'. *The Times* story ends, 'A spokesman for the Royal Army Medical Corps in Hong Kong said, "We want to know what the medicine consisted of and establish if in fact there is any benefit which can be adopted within military medicine"' (!). Ouroboros style, ancient and modern approaches up to today confront each other and in actual instances humbly (or arrogantly) make use of each other's approach.

We cannot in this book do more than give general nods to the many specialist dimensions plants can open up: medicine; superfoods like chocolate for endurance or avocado to prolong life; dyes for all colours of the spectrum; fibres such as flax and cotton; containers such as gourds; building materials from bamboo to wood; herbs - and psychotropics. Later on we make a quick summary of the herb range, but as an interlude to further hard analysis of octaval structure, we can take a quick look at psychotropics<sup>5</sup> - where the same divide in attitude shows up - simply because they are an extreme example of how they themselves can open doors to a deeper perception of life around us.

---

<sup>5</sup> A good overview is Terence McKenna *Food of the Gods: The Search for the Original Tree of Knowledge* 1992

***CROSSING BOUNDARIES: PSYCHOTROPICS***

Don Juan in Castaneda's *Journey to Ixtlan* (first published in 1973) laughs heartily when the latter approaches him to make lists of plants on which the master is reputed to have deep knowledge. It takes many meetings under his instruction for Castaneda to break the western habit of knowing *about* things without actually understanding anything about them at all. At their first encounter Don Juan says, 'I pick plants, or rather, they let me pick them... plants are ... alive, and they feel'. On their first plant expedition Castaneda is amazed to see Don Juan leaning down to a plant, caressing it and talking to it gently: he has to have it explained to him that any plant gatherer must apologise every time to plants for picking them, and must assure them that one day his own body will in return serve them as their food. Such communication must be made from true inside consciousness and understanding.

*Appendix B* maps just how many world tribes still use psychotropic plants as a way of life today (should we perhaps include our regular cups of tea or coffee in this category as mild forms of plant addiction that help to smooth the anxieties of everyday life?). As far as modern urban man is concerned, the pioneer of ethnobotany, Albert Hofmann, who discovered the constituents of LSD and its relation to the sacred morning glory of the Nahuatl peoples, and the first to synthesise psilocybin, the active principle of the mushroom revered by Central American and other tribes, also announced the presence of LSD-like alkaloids in the ergot-bearing grasses



***III. 4- 11: The inner world of organic shapes of growth and intermediate stages of form are in constant flux - detail from Michael Reagan, Inside the Mind of God (2005) p.32***

or grains used in the Eleusinian Mysteries of ancient Greece<sup>6</sup>. In his autobiography he writes, 'While still a child I experienced... deeply euphoric moments on my rambles through forest and meadow. It was these experiences that shaped the main outlines of my world view and convinced me of the existence of a miraculous, powerful, unfathomable reality that was hidden from everyday sight. Intrigued by the plant world since early childhood, I chose to specialise in research on the constituents of medicinal plants... . In studying the literature connected with my work I became aware of the great universal significance of visionary experience. It plays a dominant role, not only in mysticism and the history of religion, but also in the creative process in art, literature and science'. Even early mainline world religions used mind-enhancing plants in rituals to act as 'water wings' to give people a glimpse of worlds beyond the physical before learning how to evolve towards them and swim in them unaided through meditation, music, dance, word and the experience of nature. This is to avoid forcing the body too far beyond its capacity since by its very physical makeup it is screened from higher worlds by natural barrier-gateways - crashed through at our peril. Ignorant Western drug-taking often shatters those gates - resulting, without a metaphysical framework of higher worlds to place their experiences against, in what Shakespeare would call 'the expense of Spirit in a waste of shame', causing mental, spiritual and bodily self damage - and harm to society overall since the development of soul virtues and the exercise of moral responsibility has been abandoned in the process.



**III. 4- 12: Hindus liken mystical experience to drinking nectar from the heart of the flower**

One of the mercies of the survival of primitive peoples in overlooked pockets of the world is that they often still know more about what plants can offer humans than the official medical

---

<sup>6</sup> There is an entire branch of ethnobotany associated with the archaeology of the ancient world. See for instance Despina Ignatiadou 'Psychotropic Plants on Achaemenid Style Vessels' in Darbandi and Zournatzi (eds) *Ancient Greece and Ancient Iran: Cross-Cultural Encounters* Athens 2008 (and further references in the endnotes). The Zoroastrian Haoma was probably the same as the Vedic Soma plant. For Egypt, see Charles Musès 'The Sacred Plant of Ancient Egypt' (private publication) that associates it with *qat*, chewed all over the Arab-East Africa Triangle; and 'The Politics of Psi: Acculturation and Hypnosis' in Joseph K Long (ed.) *Extrasensory Ecology: Parapsychology and Anthropology* 1977 which looks into the development of depersonalised modern urban culture and the problem of non-religious dependency on addictive substances.

profession brought up on lists of substances in books. E O Wilson points out that of the 119 known pure pharmaceutical compounds in use, some 88 were added to the group through leads from traditional medicine. The Indian tribes of South American have gradually divulged to us knowledge not only of poisons and hallucinogens, but also of a variety of medicinal plants, including several for birth control; the Chinese use some 3,000 plants in their herbal medicine, many superior in efficacy to the hard drugs of the Western world; and many other indigenous cultures have made their contribution. As their knowledge dies out – unfortunately usually as a result of the impact of Western ways, so is it often scooped up just in time by those Europeans keener on reopening those direct links with plants than their allopathic colleagues.

Aside from ingesting its mind-expanding essences, in present times Tompkins and Bird were amongst the earliest to popularise for the man in the street a reawakened awareness of the plant world primitive man is naturally connected to, opening up the possibility of tuning in again to this hidden universe. They inspired so much further research that by 2014 it was not thought outrageous in a BBC Chelsea Flower Show item to play the music a pineapple makes when its leaves are stroked if attached to an amplifier. On the other hand, referring to the first Charles Musès item in the footnote above, Somalis in Britain who chew *qat* as a daily habit are now being arrested by the British Police for selling or being in possession of Class A drugs, totally misunderstanding the age-long cultural background of this comparatively harmless practice (European alcoholism - also based on plant substances - is a far more serious problem).

### **FLOWERS AND THE NAMING OF PARTS**

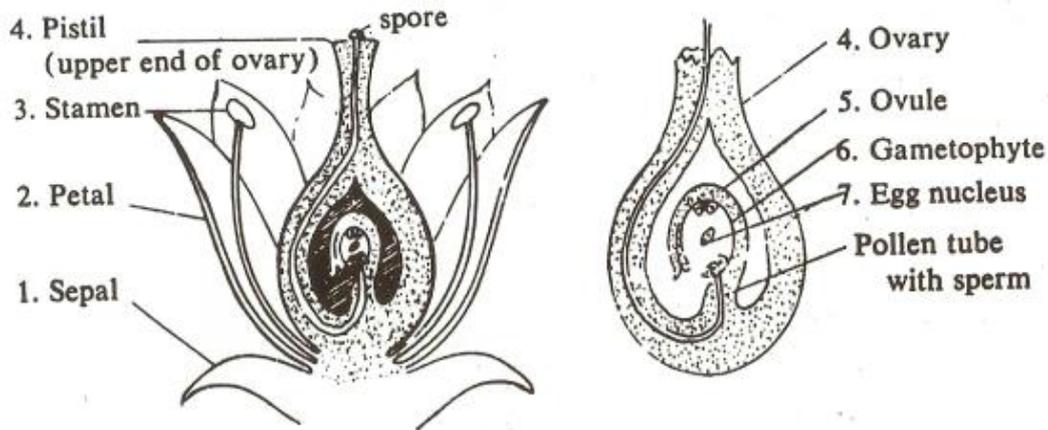
Looking at sub-octaves within the overall plant, Arthur M Young<sup>7</sup> pointed out how flowering



**Ill. 4- 13: Cross-sections of artichoke and miracle berry and print of all parts of the grenadilla creeper, its flower likened to Christ's crown of thorns (hence named the Passion Flower)**

<sup>7</sup> *The Reflexive Universe* 1976

plants in *cross-section* also show seven *layers* of tissue, most clearly identifiable at the flower level (diagram below). The sepals come first (1), encircling the petals (2), within which are the stamens holding pollen (3) and inside that circle is the sticky pistil which is the outside end of the inner ovary (4). Within the ovary are ovules (5), within which is the gametophyte, or egg-bearing, layer (6), and finally the nucleus (7) which, on fertilisation from pollen coming down the tube of the pistil, will develop into fruit and seeds. I would consider the pollen tube a layer in its own right, but from



**III. 4- 14: The flower octave of seven layers –Young p.107**

one starting point or another, the case for a *transverse* octaval layering in plants can also be made, to which *Young points out the similarity with the seven shells of sub-atomic structure*.

It was the leader of the Anthroposophists, Rudolf Steiner, who with the members of his agricultural movement, made a central issue of the plant octave, realising that each 'note' of the plant in itself contains its own mini-octave of further, vital microtones. So for instance a flower or leaf alone can be subdivided into its own octave of shapes, colours, scents, structural chemistries and spacings, and those again into yet smaller intervals of vibration and influence – most of which in the end are best taken by us as read so as not to kill the subject by too much measurement (as, for instance, in Kayser's *III. 4- 31*)!

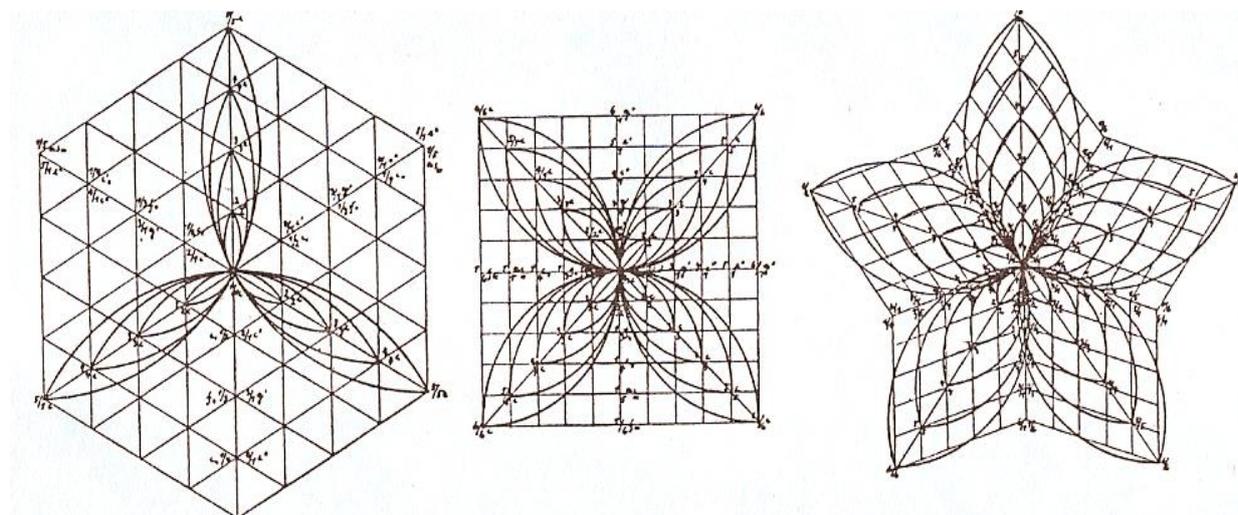
The polygonal arrangement of the petals of a flower petals is the easiest starting point (**Book 2, III.2-1**) for seeing how plain geometry and Fibonacci numbers and their combinations are operative in a plant (all flowering plants, the plant world majority, are classified as *angiosperms* – see *Appendix A*). Three- or five-petalled flowers are especially common, but 2 x 4-, 6- and 8-ray florets are regular, with the more unusual 13 in ragwort, 21 in ox-eye daisies and marigolds, and sometimes even 34 in the last two (the latter also Fibonacci numbers). Huntley in *The Divine Proportion* gives iris 2 x 3; primrose 5; ragwort 13; daisy 34 and Michaelmas daily 55 or even 89. These observations might instigate us to look more closely in this way at the flowers we buy or grow, moving on to note the arrangement of stamens and pistils within the seven differentiated layers of tissue. The Fibonacci series shows up particularly strikingly in

certain flower centres, as for instance in the more unusual 10-petalled Passion flower (*Ill. 4-13*) with its 3-part pistil rising above a five-branched stamen, encircled by (I have counted for myself) 89 purple and white filaments! Then we see how the ovary section of the flower swells into a fruit (notice how the remains of the flower often remains on it, as on the navel of an apple), the fruit in turn containing one or many seeds (as, for instance, in the poppy seed-head of *Ill. 4-6* (source of heroin and morphine) which we know contains hundreds of tiny seeds, or the Passion fruit itself with its many tasty jelly-covered seeds inside).



**III. 4- 15: *Passiflora* (Passion Flower) – c.f. *Ill. 4- 13* – and lotus flower (right)**

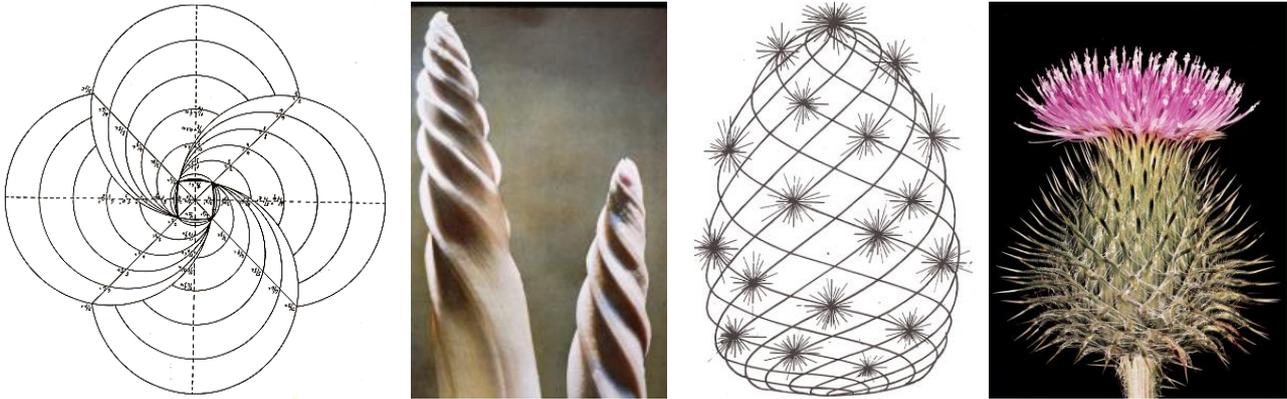
Kayser writes, 'One must agree that in the soul of plants certain form-carrying prototypes – [usually] thirds and fifths – are at work which, as in music, shape the blossom forms as intervals'. His analysis of flower shapes (next illustration) is as detailed as that for leaves, and it does not take much to become just a little more alert oneself in not only counting petals around a centre, and major and minor number themes, but also to see through to the musical nuances of actual outlines. We start ourselves to see at Kayser's level of detail, breaking down even the



**III. 4- 16: Geometric generation of flowerheads – Kayser *Harmonia Plantarum* fig. 91**

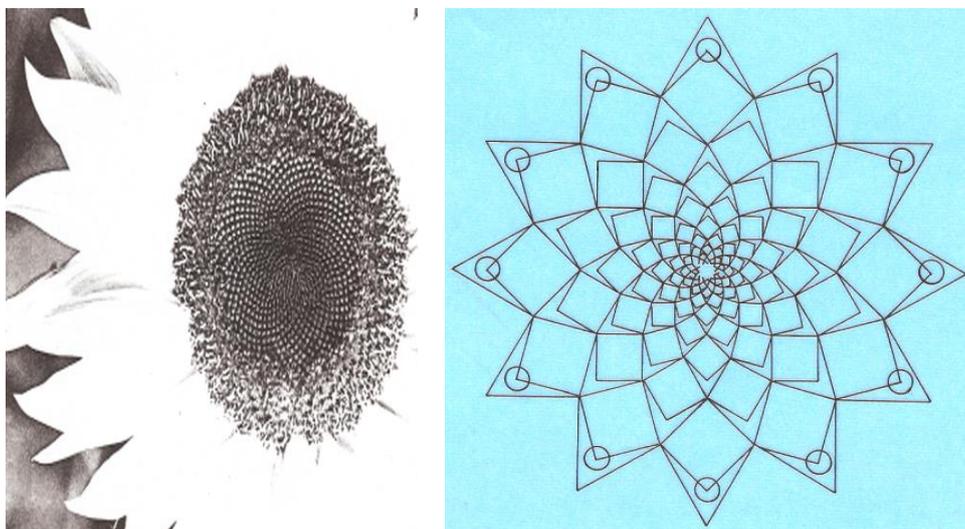
most complex flower into its constituent parts, angles and microtonal lengths – without necessarily having to put numbers to it all – more to sense the overall gradations at work. Most

flowers unfold in a spiral moving in one direction (as below) – indeed the study of the exquisite ‘packaging’ of the flowers or leaves of an emerging plant, with intermediate protective layers or sheaths, is a study in itself - on which modern man-made commercial packaging is based. A spiral arrangement can also be seen in the disposition of cactus florets or thistle spines as they follow the Fibonacci series in a double-spiral going in each direction down the main body:



**Ill. 4- 17: (left) Petals unfolding - Kayser fig. 92; (centre left) Morning Glory bud on the point of opening; (centre right) Cactus spine or floret spirals – Doczi fig. 130; (right) Thistle head**

This double-whorl is seen on a two-dimensional plane in the arrangement of seeds at the centre of the giant sunflower (below), where the number of spirals running one way are in Fibonacci ratios to the number of spirals running in the other. Daisies, too, may show from 21 running one way to as many as 89 or even 144 going the other – as also for the thistle head. The usual number of spirals running clockwise is 55, interweaving with either 34 or 89 spirals running counterclockwise. The principle of their arrangement can be expressed diagrammatically (below right) by the harmonic progression of arcs of spiralling squares whose size increases outwards by Fibonacci ratios. The diagram can be read as a flattened rendition of the pine cone, with its close-packed assemblage of woody scales tightly arranged into interlocking rhomboidal shapes.



**Ill. 4- 18: (Left) detail of sunflower centre; (right) geometric principle of the sunflower double spiral – Josephine Munthali after Keith Critchlow, ORDER IN SPACE**

### HEALING WITH FLOWERS

The microtones embodied by flowers are subtle and multitudinous, offering variations of form, colour, nectar and angle that heal and appeal to senses, mind and spirit all together (we need to wait until *Book 7* to discuss the music of colour gradations and perfume properly). Such variations are surely a reason why gardeners seek new species, colour combinations, and hybrids (in other words, always looking for new tunes to try). One way the finer vibrations of flowers have been accessed is through their healing powers as potencies dissolved in water (google key words to find specific present-day healing centres and publications).

Edward Bach's intuitive discovery of the healing power of 38 specially chosen flowers, whose essence he first collected in the dew from their petals, later by floating them in pure water in sunlight - the solution mixed to homeopathic dilutions - is one of the more recent discoveries of how flowers can heal not only physical malfunction, but also, more importantly, the psychological hurts which often cause them in the first place. As one Bach Flower Remedy booklet<sup>8</sup> puts it, 'The 38 Remedies cover every negative state of mind known to Man... providing... a simple and natural method of establishing complete equilibrium and harmony through the personality by means of wild flowers'. These remedies cover seven main causes for dis-ease at various levels of intensity:

FEAR; UNCERTAINTY; APATHY IN CURRENT CIRCUMSTANCES;  
LONELINESS; DESPONDENCY AND DESPAIR;  
OVERSENSITIVITY TO SURROUNDING INFLUENCES;  
OVERCONCERN FOR OR CRITICISM OF OTHERS

To take one example, under Fear come

- 🌸 sheer terror – allayed by Rock Rose
- 🌸 phobias – allayed by Mimulus
- 🌸 anxiety for others – allayed by Red Chestnut

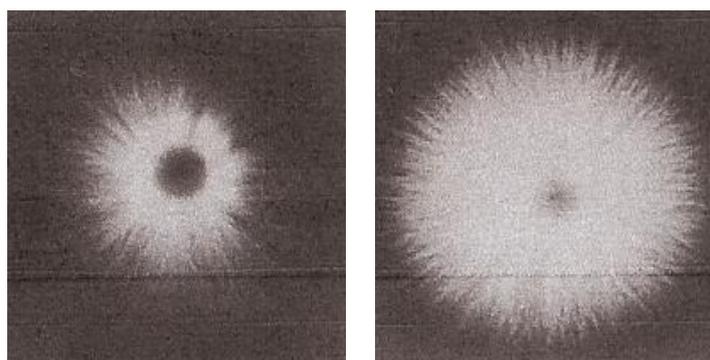
Bach had given up a Harley Street practice to seek more natural cures, spending days wandering in the Welsh and English countryside (usually from late summer) seeking the right flowers which he believed vibrated on a very high frequency in ways that could raise the sluggish notes of sick people. He chose his flowers by feeling their radiance as he lightly placed them on his hand and tested their effectiveness on himself, finding that they caused in him the states of mind and illnesses which they could cure (experiment with this yourself). He likened his flower remedies to beautiful music or arrangements of colour that flood the psyche and body with subtle vibrations in such a way that 'disease will melt away as snow in the sunshine'. Barnard writes, 'Many of the states for which he later found an antidote he experienced in himself as intense suffering, both mental and physical', contributing to his early death at the

---

<sup>8</sup> Julian Barnard *A Guide to the Bach Flower Remedies* 1979

age of 50'. He thus added a crown to the hundreds of natural substances collected by the first homoeopath, Hahnemann, who had discovered that highly dilute solutions of any natural substance are more effective than concentrated ones, and that cures are effected by matching like to like (*similia similibus curantur*) - exactly the principle of vaccination discovered by Lister - and with no uncomfortable side effects! Although scientists understand the vaccination principle, they have been puzzled by the dilution phenomenon, but if one molecule of a substance is stretched out in a solution to extreme dilution it is said that the subatomic realm, where the real power lies, is brought into play. Perhaps when we take flowers to someone in hospital we have forgotten the true reason for doing it - since the patient should smell and stroke the flowers and embrace them as part of the cure. We should give real home-grown flowers with true perfume and not greenhouse hybrids which have lost their scent through mass-production and chemical fertilisation. The writer Myrna Lewis found when visiting Black Sea sanatoria in Russia that patients were not treated with drugs but required to visit large greenhouses every day and smell certain flowers for a number of minutes several times a day. They were also treated with music recitals and recordings of the sea breaking on the shore.

Elizabeth Bellhouse started out as a Bach Flower Remedy practitioner and was intuitively led to make further discoveries about the radiant power of flowers, creating her own mixture called *Vita Florum* which is still sold today by her heirs in liquid, powder, ointment and massage oil forms, for use not only on humans but also on farm animals and crops. Through certain experiences which she described in her autobiography she eventually claimed her elixir was so multivalent it connected the user to the Divine Principle itself, resulting in a beneficial, flourishing condition on all planes. At one point she was taken to court as a quack for seemingly simply selling plain water in bottles, but Kirlian photography revealed the difference:



**Ill. 4- 19: Drop of water from Bellhouse's local water authority (left), compared to a drop of that same water after Bellhouse's flower and meditation infusions**

These discoveries were being made out of the public eye and gradually coming to the fore at a time the Hippy movement was extolling Flower Power as a slogan - mostly unaware of its true depth - but people are often made the unconscious bearers of general spiritual truths more far-reaching than is their role to know at the time, enabling others silently to pursue finer dimensions.

In ancient Egyptian art the Pharaoh is sometimes shown presenting flowers to the God or Goddess instead of precious unguents or other offerings, and still in the Hindu religion today garlands of fresh flowers drape the statues of their Gods and Goddesses daily. Flowers go with



**III. 4- 20: Ramesside temple relief with the Pharaoh presenting lotuses to the Goddess Hathor** weddings and funerals because of their divine fire – and only today does knowledge of their music and atomic structure enable us to understand precisely why. In flower arrangements at churches and other spiritual gatherings the living music of plants is given back to the Divine Order, in recognition of their superior and all-governing origin. Their living music of colour, geometric, structural and perfume levels can be more compelling than a bare diagram in leading the soul to higher dimensions and reach a lasting state of calm and joy (described by Hindus as *Sat-Chit-Ānanda* - saying those words over and over again alone gives Bliss).



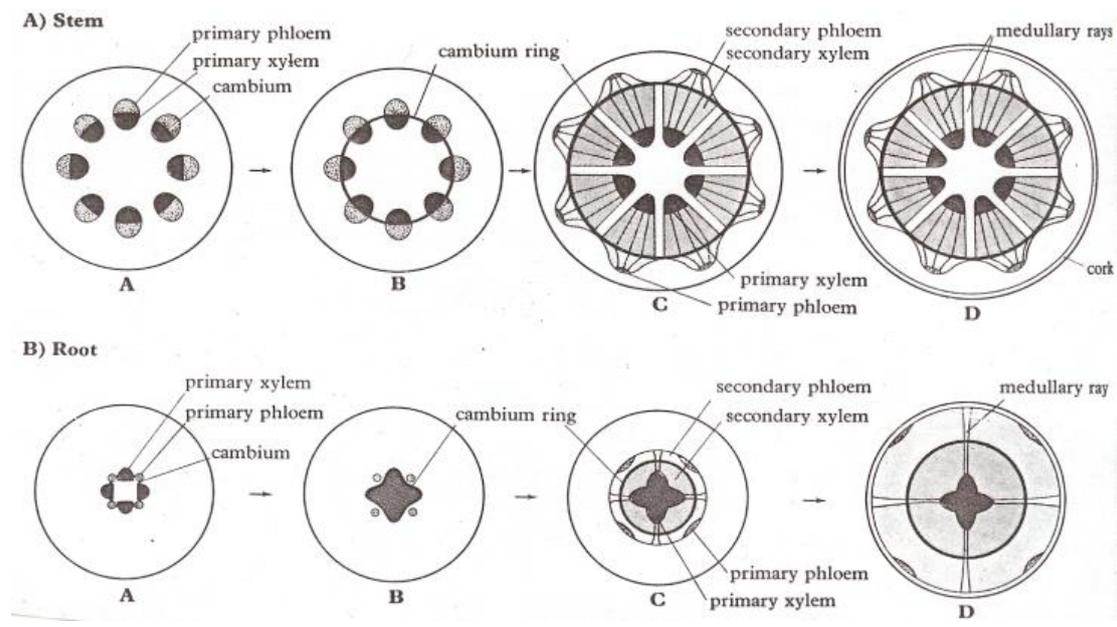
**III. 4- 21: Lotus Mandala by Barry Stevens (see [www.mandalas.co.uk](http://www.mandalas.co.uk) )**

Certain flowers have played a deeply symbolic role in man’s psyche, answering to the structure of his own variously-petalled chakras (illustrated in *Books 0 and 6*). The Rosicrucians see all the chakras as roses that open or close as they activate. In far eastern religions it is the lotus with its rings of petals which provides the analogy for the layers of creation and the journey to the centre where heart and Nirvana meet (*Ill. 4- 15 right*).

We can do so much more to consciously open ourselves out to the inner impact of flowers in their finer dimensions and think what we are doing when presenting a bouquet (or accepting one for that matter). It was a beautiful gift by France to Queen Elizabeth II to rename their Paris flower market in her name in June 2014 for the 70<sup>th</sup> anniversary of D-Day. Saying it with flowers really does go back to the Numbers of the Universe and their heavenly Harmony.

**ROOT, STEM AND BRANCH**

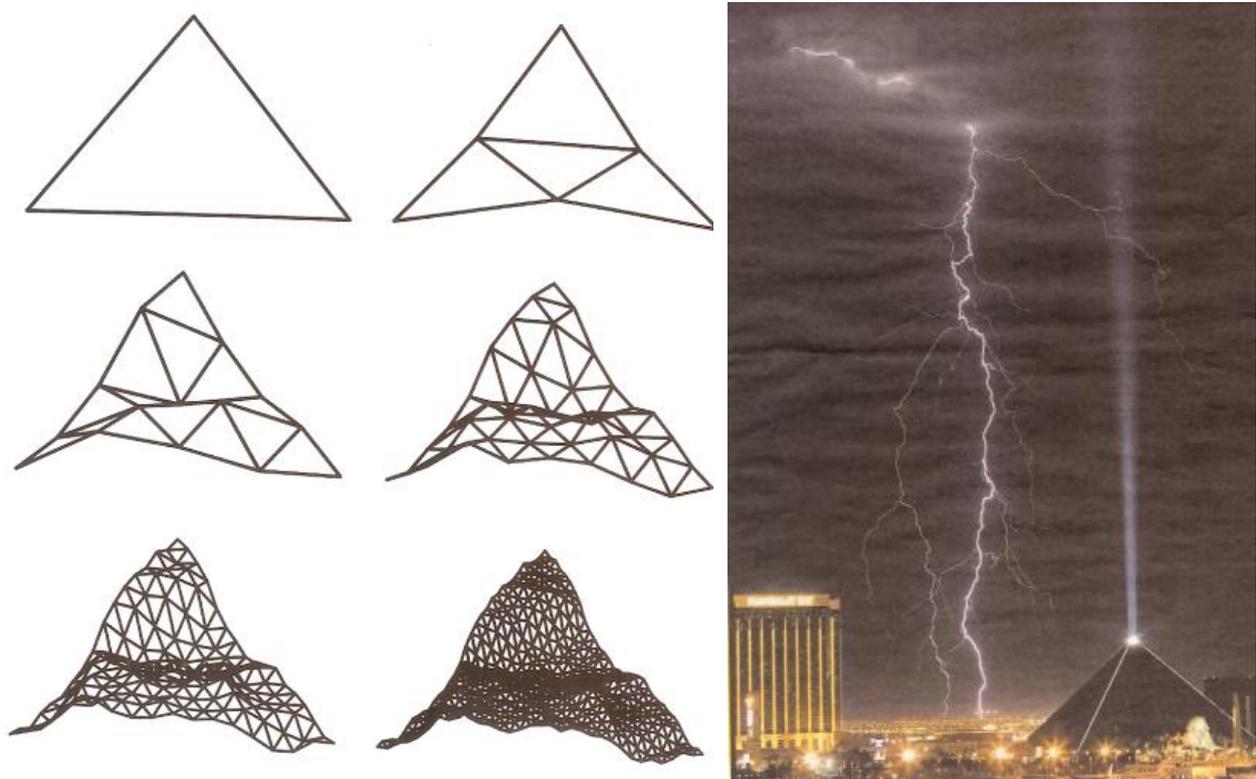
The arrangement of cells in stalks is usually rigid since they must hold up the entire plant – and is usually very obviously polygonal, with cells fitted concentrically. Similarly, the cross-sections of roots - essentially adapted pipes leading to the stalk - show cells arranged round the central artery, even when swollen to vegetable proportions, as in turnip, carrot or even tree trunk. The obvious overall vertical and horizontal octaves of the average flowering plant which we have already described are easy to see – while in the cross-sections of roots or stems their geometry is more clear-cut and less variable. When it comes to growth patterns overall, where (as seen in *Book 5*) minerals are governed by rigid  $\sqrt{3}$  geometry, plant life is governed by the fluid networks enabled by  $\sqrt{5}$  ratios that generate the Fibonacci Series and nested Golden Section-



**Ill. 4- 22: Patterns of growth and development in stem and root cross-sections – from a standard biology textbook, Roberts’ BIOLOGY: A FUNCTIONAL APPROACH fig. 26**

based interlocking shapes. The fluid, intermediate shapes of nature often at first glance do not seem to be based on geometry at all, but Mandelbrot’s fractal geometry recently caused as

much of a cult following as Hans Jenny's experiments with sound, since it can express any organic form if first reduced to its basic seed shape and then used in agglomerations of it as

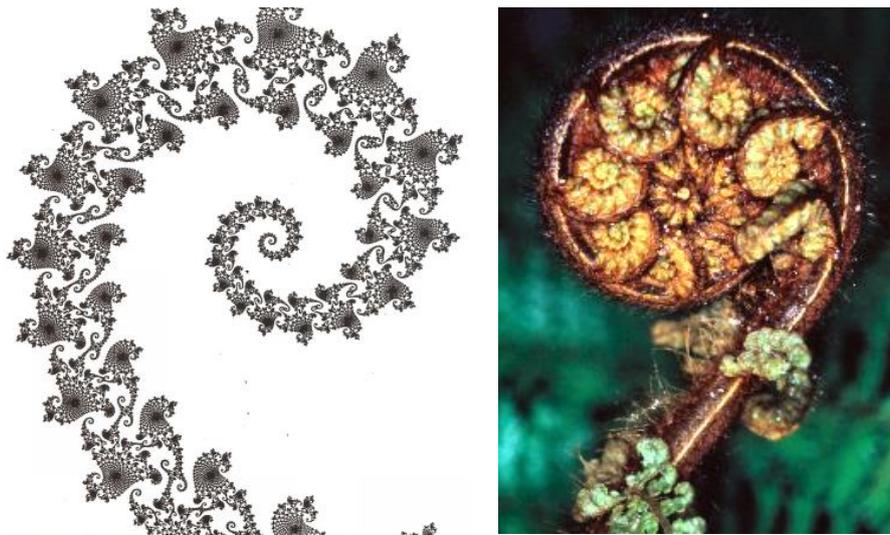


**Ill. 4- 23: (Left) Expression of the mountain form using fractal techniques by Alvy Ray Smith – from Holtzman *Digital Mantras* fig. 13.5; (right) lightning at Las Vegas (note also the pure triangles of the pyramid that contrast with the organic, flexed ones of the mountain)**

the basic architectural unit repeated in succeeding sizes on an ever-increasing or -decreasing scale. As Mandelbrot<sup>9</sup> said, 'Clouds are not spheres, mountains are not cones, coastlines are not circles, and bark is not smooth, nor does lightning travel in a straight line'. Thus the overall form is built up by 'flexing' the units, as in the example of the mountain (above left) which starts with the seed shape of the triangle.

Fractals are a geometric system that has been used to explain shell or plant growth, as in the case of the nautilus shell spiral based on miniature versions of itself, or the organic actuality of unfolding mini-spirals in an opening fern leaf (next illustration). This new geometry that caters for nature's irregularities can be followed up in the many beautiful books Mandelbrot inspired: their algebraic equations alone are forbidding, but the images alone speak for themselves, showing processes in nature that work on a principle similar to homoeopathy whereby structure arises out of self-similarity replicating itself endlessly in smaller or larger sequences. The key, as with other geometries, is to look beyond complexity to underlying simplicity. In the fractal version of the nautilus spiral we remember from *Book 2* on *Geometry* that its gradated reduction in size as it homes in on the centre is, again, entirely due to Golden-Section ratios.

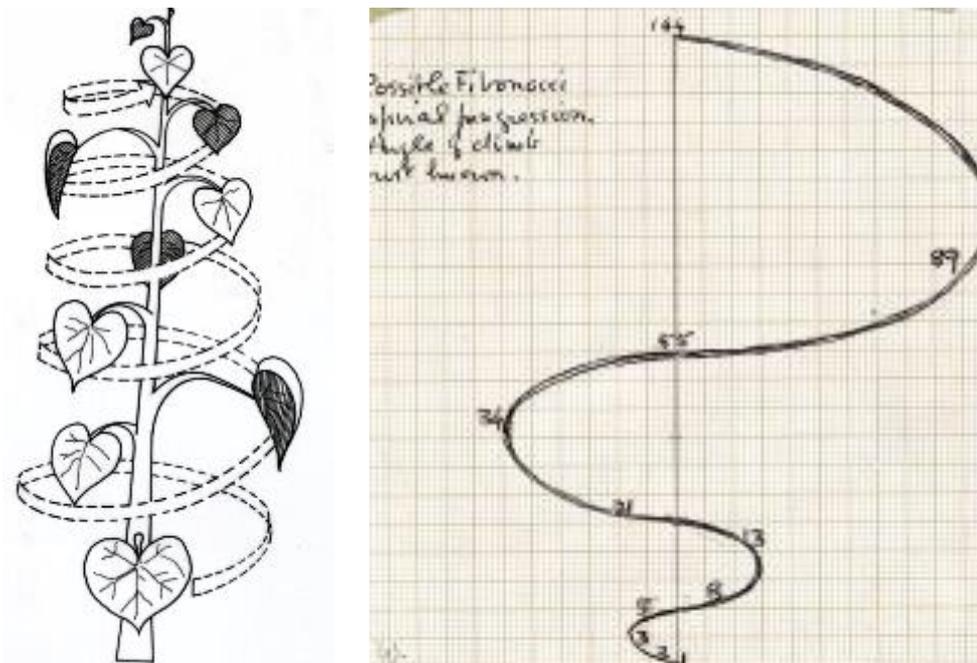
<sup>9</sup> Benoit B Mandelbrot *The Fractal Geometry of Nature* 1982



**Ill. 4- 24: (Left) Fractal version of the nautilus spiral, itself a giant blow-up of one section of a basic cluster unit which through self-replication serves to form it – from Peitgen & Richter<sup>10</sup> p.88; (right) precisely the same process is seen in a developing fern shoot (photo K Marshall)**

**PHYLLOTAXIS AND BRANCHING**

From the smallest plant to the mightiest tree, branching is part of the circular movement of plants (Ill. 4- 1) and it usually takes place in a spiralling motion around the upright stem of the plant. Goethe noted how vegetation grows up both vertically and spirally, seeing the vertical direction as the male force and the unwinding circle the female force at work: Doczi called the interchange between both impulses *Di-energy* – a clumsy term better understood as the push-pull of that underlying polarity holding up the entire universe that was the theme of *Book 0*.



**Ill. 4- 25: Phyllotaxis (left) and the dwindling spiral of a dowsing pendulum (right)**

<sup>10</sup> H-O Peitgen and Peter H Richter *The Beauty of Fractals* 1986

One of the ways of spotting di-energy at work is to study the growth arrangement of leaves round stems or tree trunks, a specific leaf-spacing phenomenon known as phyllotaxis (above left). The way the leaves are arranged and the distances at which they emerge from the stem again follow harmonic proportions. Thompson<sup>11</sup> felt that the ancient geometers must have noticed this spiral arrangement of leaves round a central axis and the angles of branching, and that they probably applied those principles to the proportions of architecture (as in the modulated parts of the Greek temple and its parts - followed up further in *Book 11 on Architecture*). One obvious reason for the harmonic spacing of leaves, also becoming successively smaller as they rise on the vertical support, is to ensure each faces the sun without being overshadowed by others, to ensure photosynthesis to take place. He noted that by starting from a leaf at the bottom and proceeding upwards and round the stalk, decreasing in size harmonically as they unfold up the stem, each succeeding leaf would be at 2:5 of the circumference of the stem round from the first, an angle round of  $144^\circ$  to  $360^\circ$  round, i.e. at the ratio of 2:5. Remembering that  $72^\circ$  is the inner angle of a pentagon,  $144^\circ$  is twice that, there is thus an implicit pentagonal arrangement of leaves whose size and spacing up the stalk follows, once again, the Fibonacci intervals (above left).

Look out for this yourself next time you stand in a park instead of looking vacantly into the distance! Once you get your eye in to the phenomenon you will see it at work in any plant you pass, some more clearly than others (grasses, for instance, are more linear in their makeup), but all the same note the spacing of the nodes up the stalks: phyllotaxis is sometimes innocuously understated. Anyone wanting to study it in all its variations should go to Thompson's original edition, as unfortunately the abridged version, published in 1969, omits the whole of the chapter on phyllotaxis as well as two other chapters. The reason for this can be traced to the Introduction where the editor, T Bonner, seemed to find any mention of Platonists or Pythagoreanism outdated and no longer relevant, symptomatic of the arid and short-sighted scientific view later to predominate in the polemics of the run-of-the-mill science world at least.

The ratios of stalk lengths vertically between leaf nodes enable us to define the growth of any plant in musical terms: it grows within the three-dimensional space it occupies according to the 'scale' on which it has been composed, though you will notice the plant has the intelligence to adapt and extend further into any vacant space it can find, favouring those spots that catch the most sun. As you will notice, leaves do not always spiral round but can be spaced at intervals up the stalk as if at the sides of simple polygons – but altogether Thompson showed the most common to be the Fibonacci-related spiral progression:

1:2; 1:3; 2:5; 3:8; 5:13; 8:21; 13:34 etc.

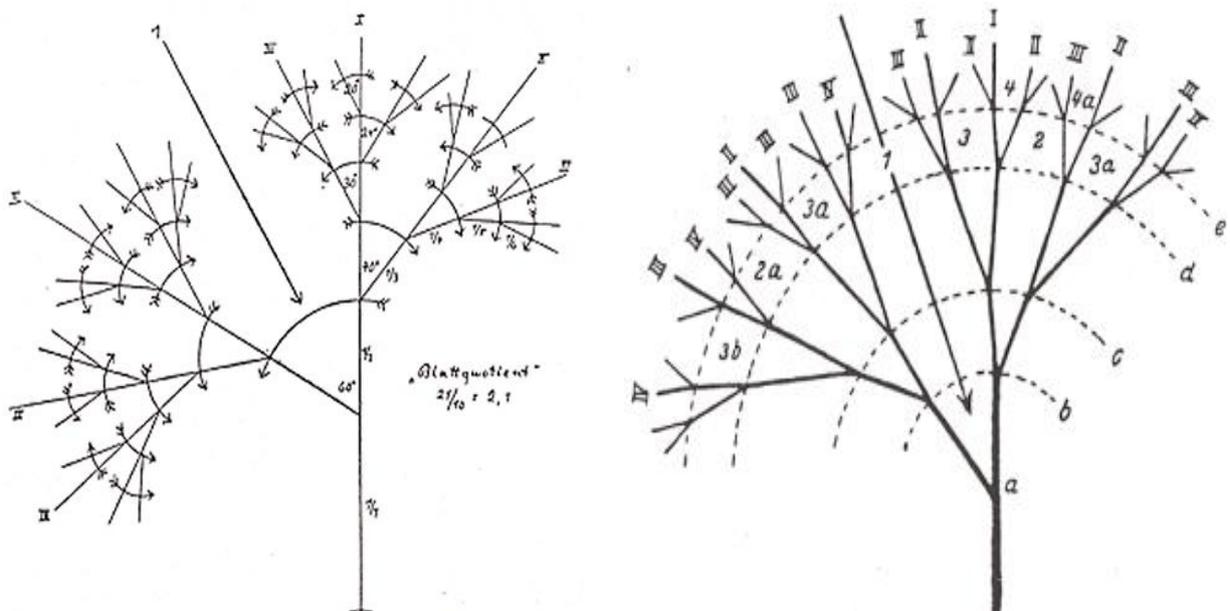
---

<sup>11</sup> D'Arcy Wentworth Thompson *On Growth and Form* first published in 1917 and continuously in print since.

In the Fibonacci series the last and first terms are added together to produce the next, giving spacings roughly equal to the 1:1.618 ratio (Golden Section). In leaf arrangements the most frequent starts with 1:2 (the first pair sprouting from the seed), then the sequence unfolds. This is the series for the spiral arrangement of pine cone seeds, cactus spikes, daisy, sunflower or thistle seed heads (*Ill. 4- 17*). Count the parts and spacing of whatever plant you scrutinize, looking at how far round in degrees the placings are, as well as how far up they are positioned. Other spacing sequences Thompson spotted were: 1:4, 1:5, 2:9, 3:14, 5:23, etc. and 1:4, 2:7, 3:11, 5:18, 8:29, etc.: in the former each ratio comes from adding the numerator and denominator of the previous fraction, whilst the latter series has more syncopated jumps. Pursuing the Fibonacci fractions further Thompson writes, 'Whenever any system of spiral steps is present, certain others invariably accompany it. The spruce cone is said to have a phyllotaxis of 8:13, but there are even steeper scales up to 13:21, and we may find lower series of 5:8, 3:5, or even 1:2 in different species'. Interestingly, Lethbridge in his use of a pendulum in dowsing recorded its dwindling circular pattern as a Fibonacci spiral (illustration above right).

**BRANCHING HIERARCHIES**

Connected with phyllotaxis, a slightly different process is that of successive hierarchies of branching from one original trunk (we take it as read that roots branch in similar fashion). Leonardo da Vinci was as interested in the branching of trees as in the curlings and furlings of waves and many of his drawings are attempts to systematise the laws of growth. While the Victorian art critic John Ruskin sat in front of a tree drawing its branches, he experienced such deep identification with the laws of nature that it led to his main criterion of art, that the best art imitates nature, taking as masterpieces the paintings of Turner - and the Pre-Raphaelites. Any person can do as Ruskin did by sitting down with pencil and drawing pad in front of a



**III. 4- 26: Kayser's analysis of the microtones of branching trees**

clearly branching tree in the cold season and following its progress from trunk, to first fork, to subsequent forkings. Not surprisingly the experts found, again, that the patterns follow the Fibonacci series in the steady unfolding of branches and twigs which, if bunched together at any one level of outgrowth, will equal in circumference the branch or trunk they come from. D’Arcy Thompson tried to explain branching in geometrical terms but Kayser took this further by systematically relating twigs and branches to string-lengths, angles and their musical notes (see under **LEAVES**, below). His measurements bear inspection with a magnifying glass!).

We start to understand the nature of Moses’ mystical experience of The Burning Bush, when God conveyed the hidden divine in-forming it as a sign of his communication with the Jews of Exodus, whilst elsewhere in the Bible the leaves of the Tree are named as ‘for the healing of the nations’. The divine nature of branching trees is particularly symbolic as a model of hierarchies of existence. The Buddha gained his enlightenment while sitting and meditating under the Bodhi tree, and Adam and Eve were banished from the direct presence of the Tree of

<b>A</b>	Ailm (Elm)	<b>B</b>	Beite (Birch)	<b>C</b>	Coll (Hazel)
<b>D</b>	Dur (Oak)	<b>E</b>	Eagh (Aspen)	<b>F</b>	Fearn (Alder)
<b>G</b>	Gath (Ivy)	<b>H</b>	Heath (Whitethorn)	<b>T</b>	Togh (Yew)
<b>L</b>	Luis (Rowan)	<b>M</b>	Muin (Vine)	<b>N</b>	Nuin (Ash)
<b>O</b>	Oir (Spindle tree)	<b>P</b>	Peith (Pine)	<b>R</b>	Ruis (Elder)
<b>S</b>	Suie (Willow)	<b>T</b>	Teine (Furze)	<b>U</b>	Ur (Heather)

**III. 4- 27: The Druid Tree Alphabet**

the Knowledge of Good and Evil for misusing its knowledge. The Scandinavians proposed Yggdrasil, a giant ash tree, holds up the world, as do most civilisations of the world in variations of the Tree of Life, including the Hebrew stylized Sephirothic tree (illustrated in **Book 0**) whose wisdom underlies the entire western sacred tradition. Tammuz, Osiris and Christ are all likened to trees, the Tree of Life or the living vine. The Prophetess Deborah gave pronouncements from under a palm tree, and in Islamic tradition the Virgin gave birth to Christ by standing under a palm tree and shaking it – as did the Buddha’s mother before. The bay tree was the tree of prophecy which inspired the Delphic Priestess in the delivery of her oracle, and was preceded historically by the oracular oak of Dodona– one example of the Europe-wide Stone Age religion later called Druidic, whose alphabet was represented entirely by trees (above). This calls to mind Shakespeare’s line from **As You Like It** that there are ‘tongues in trees, books in the running brooks, sermons in stones and good in everything’.

D’Arcy Thompson was quite sure there were essential organising principles without which there could not only be no manifestation, but no interaction between entities in the realm of nature; that inner forces control and limit growth as do outer conditions, the latter playing a large part

in drawing down the ideal forms into combinations of the four elements of water, air, fire/light and earth. Some writers, with the Pythagorean *Five Elements* in mind allocate roots to Earth, the stem as the fluid carrier, the leaves as the air processors and the flowers as forms of fire (indeed, they have been measured as having a higher temperature than the rest of the plant). One can see fruits as a synthesis of all four, with the seed storing the Aetheric principles for the next generation. D'Arcy Thompson proved over and over again the inevitability of any organic form, elegantly structured to perform with maximum efficiency the role allocated to it within the environment it found itself in, since nature must produce entities that will perform harmoniously with each other: though being of an earlier generation he was oblivious to the subatomic world, and lived too early to know the detail of Kayser's work supplying the musical explanations.

### HERBS

Usually when we think of herbs we mean leaves – though there are exceptions where it is other parts of the plant that contain the potent substance, such as root or seed. It is also difficult to draw the line between 'just a plant', a herb, and a special food that we wouldn't necessarily call a herb – while many so-called 'weeds' such as dandelion or nettle turn out to be powerful herbs! We cannot dwell at length on the full range of what individual herbs do for us, but there are endless books on the subject the reader can turn to, from culinary use to medicinal - and how best to grow them for yourself<sup>12</sup> and try all possible uses - including dyestuffs<sup>13</sup>. Having gone through a craze for herbs in the 1970s, buying practically every book that came out on the subject (even though they repeated each other) and dyeing cotton and silk pieces all kinds of colour from plants in my garden, when I had to down-size I found the most comprehensive small book worth holding on to was John Lust's *The Herb Book*, continually in print since 1974, which I used here to remind me of the overall perspective. We stand at the end of a long process of oral knowledge passed down from Neolithic Man which is too valuable to ditch in favour of artificially synthesised substitutes which so often miss out the one vital dimension the plant substance offers, as if their individual tunes are given to us, but off-key – and enough to seriously matter. Due to the baneful influence of the worst aspects of the scientific approach, most herbs are actually banned by the European Union because their effects have not been 'scientifically tested'! But adherence to the obvious beneficial effects of plants by the mainline population still in touch with that powerful tradition which has come to its own conclusions about what each plant does through centuries of trial and error is too strong to be pushed under by such bureaucracy. At the tip of the chronological iceberg, after printing was invented, Lust points out that in documentary terms the earliest Chinese Herbal dates back to 2700 BC,

---

<sup>12</sup> See, for instance, James Wong's *Grow your own Drugs – Easy recipes for natural remedies and beauty fixes* 2009 and *Homegrown Revolution – amazing edibles from saffron to sweet potatoes* 2012

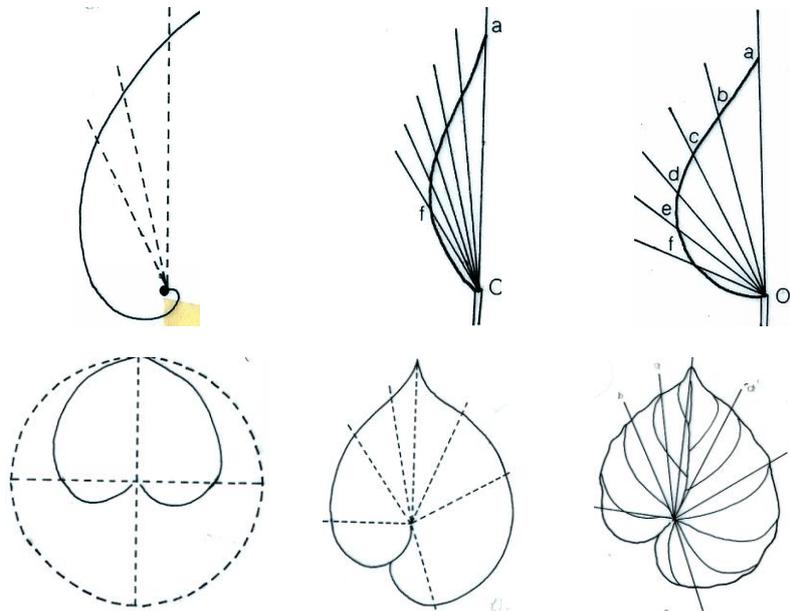
<sup>13</sup> See, for instance, Alma Lesch's *Vegetable Dyeing* 1970, Rita Buchanan's *A Dyer's Garden* 1995 and the amazing story of Indigo as told by Catherine McKinley in *Indigo: In search of the colour that seduced the world* 2011

and that by 1000 BC the ancient Egyptians knew as much about indigo as they did about mint or opium. Then of course the famous late mediaeval manuals (amongst the first printed in Europe) - such as *Gerard's Herbal* - liberated such knowledge from the secrecy of the alchemists to the ordinary urban population now beginning to lose contact with rural life and its ancient lore – so often only passed down through the housewife or wise old woman.

### LEAVES

Young saw how, even though lower life forms self-develop to some extent, it is plants that provide the first stage of biological life that is very clearly proactive in Evolutionary terms. It is not simply a matter of 'survival of the fittest' through adaptation, but of the capacity for *growth* through cell-development – and the ability to *procreate* future versions of themselves through seeds or cuttings – this Young deems a 'purposive' trait not seen before (the *intelligence* of the plant world - as opposed to its *emotions* - shows up in other ways, explored more later). Suffice it to flag up here that it is the role of leaves on their stalks that lies at the heart of that quantum jump that enabled the plant world to move up an octave from the domain of the simplest protoplants (listed in *Appendix A*, taken from Young's Chapter VIII).

Thompson saw flower petals as variations on the leaf and the flower centre simply as the



**III. 4- 28: Variations on leaf shape according to angles of veins – reduced sketches by Josephine Munthali after Thompson/Doczi – compare with III. 4- 30**

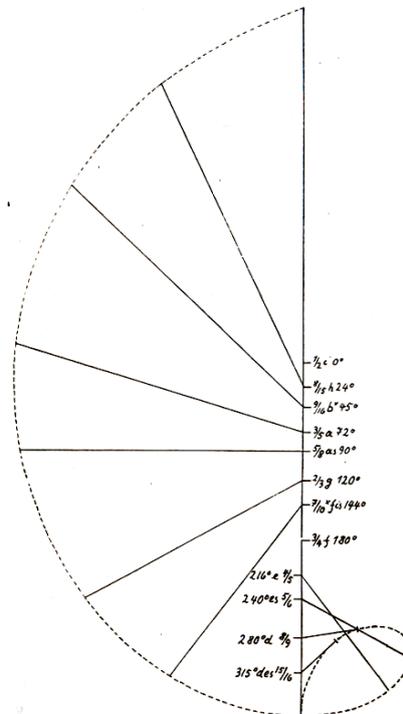
flattened termination of the stalk, their disposition around the centre point being the geometric constant. At his level of enquiry, Thompson in *Growth and Form* demonstrated how plant and animal life in all stages of growth adopts forms that conform to numerical unfolding, and spent a lifetime taking careful measurements of the dynamics and shapes of plants and their patterns of growth. He tried to define how the geometry of leaves, with their branching veins, led to organic variation simply due to changes of angle from what in pure form would have been grids

of parallel lines. Doczi<sup>14</sup> drew these more elaborately, but the images as simplified by Josephine Munthali above make the point sufficiently.



**III. 4- 29: Dead leaves in losing life and green chlorophyll move to complementary red colours**

Gerbert Grohmann<sup>15</sup> spelled out more explicitly the idea that the leaf is the baseline for the plant's next stage of evolution into the flower octave illustrated in *III. 4- 14* – thus the sepals are specialised leaves, inside whose containing rings petals evolve. The pistils in turn are modified petals, well seen in the lotus or passion flower (*III. 4- 15*), and all fruits and seeds develop out of ovary tissue – which itself is evolved stem tissue. So fundamental for seeing how this must work is understanding of the transverse octave of the plant (*III. 4- 14*) as it follows different stages of expansion and contraction/self-sacrifice in order to rise to new levels.



**III. 4- 30: Kayser's 'Teiltoncurve' – Form der Geige ill. 3**

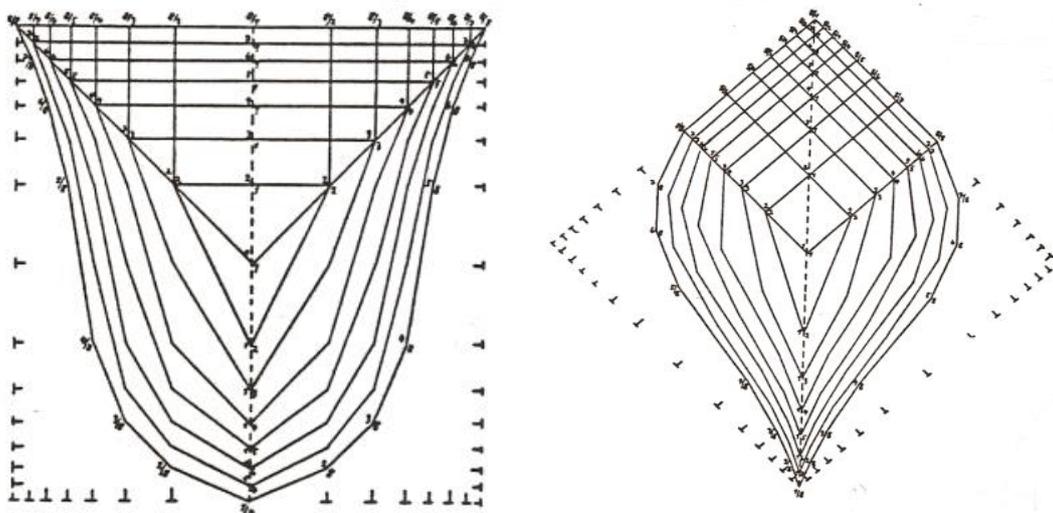
<sup>14</sup> G Doczi *The Power of Limits: Proportional Harmonies in Nature, Art, and Architecture* 1981 and reprints

<sup>15</sup> *Die Pflanze* (translated as *The Plant* 1989 by K Castelliz and Barbara Saunders-Davies)

The leaf is therefore absolutely crucial to the subsequent development of the plant, being the medium for its gaseous exchanges of Carbon Dioxide and Oxygen with the ambient atmosphere and generally the main 'factory' for the chemical exchanges of atomic Elements and planetary influences vital to the plant's life and development. We come back to these factors further on: for now, as with the other plant parts, we consider the musicality of their structure.

Where Thompson had made an impressive start on analysing leaf shapes, it was the detailed analysis made by Kayser in another of his books, *Harmonia Plantarum*, which opened up the microtones of leaf and petal structure with absolute precision, starting from the coordinates of the initial three-dimensional blueprint of the Platonic Six Directions of Space. At the microtonal level he concluded, 'It can be said that the framing intervals of the octave, which is the very basis of music-making and of sensation, contains within it the form of a leaf' - implying each type of leaf is a specific green raga, or musical scale. Let us see what this means.

The radiant lines from their centre points are in essence string lengths, as summed up in the Tonal Curve diagram he made for another of his books, *Form of the Violin* (above). He also saw the angles of the radiant lines from the centre point of any leaf or flower petal were real life applications of his Tone Circle (*Book 1, Ill. 1-48*) and Tone Spiral (*Book 1, Ill. 1-47*), meaning changes of angle within any one radiant line was a note shift. Hence the high, sweet music of leaves or flowers arises from the angles and lengths of the leaf veins or petal shapes. His treatise on the violin form explains not only the monochord factor along the stem of the instrument but also the acoustic reasons for the curvilinear shapes of its body with its leaf-like



**Ill. 4- 31: Two drawings of flowerhead microtones –Kayser's *Harmonia Plantarum* ill's 84/85** outline. Metaphysically the generating centre point of any leaf is the Doh or Middle C of all ensuing notes, and can be read also as the Solar centre of a mini-planetary system of orbits.

Using Kayser's 360° Tone Circle and corresponding notes for the various angles round the stem, we can as well precisely plot and number the branching pattern of any plant, and virtually hear

its musical blueprint at work as well. Because he made the connection between form and quality (described in *Book 1* on *Music*) he was able to show in relation to plant shapes how every flower, every leaf, every branching, is not merely quantity, but essential spiritual qualities translated into line, angle and plane (we have seen above how his diagrams analyzing the nature of tree branching show an astonishing level of detail in matching the process to music).

Plants are considered static because they do not actually use their roots as legs to walk with, but though fixed in the ground they still show a huge range of movements which time-lapse cinematic photography reveals. As one great master said, plants are never unfaithful, since their flowers and leaves always twist round to face the Sun, wherever it is. People travelling through Spain have seen the phenomenon of an entire field of Sunflowers turning their heads as one to follow its course from east to west during the day. Because trees take so long to come to term, the spiral motion of their straining towards the Sun often leaves a permanent mark in the twisted 'muscles' of their trunk, or in the corkscrew of the urban evergreen tree which I spotted on a building site (below centre). Obviously, along with the Moon, the Sun is the main planet governing plant life: but we can also see the signs of other planets at work.

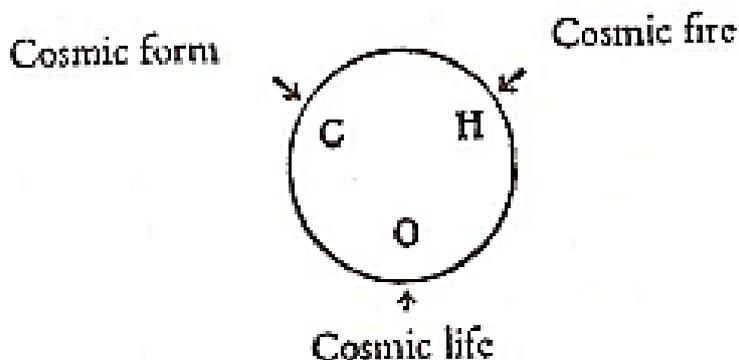


***Ill. 4- 32: Root, tree and leaf – and a small conifer spiralling to follow the Sun – explained by Goethe and Hauschka as resulting from the pull between the vertical/male and radial/female***

### ***THE SUN AND CHLOROPHYLL – AND OTHER PLANETARY INFLUENCES***

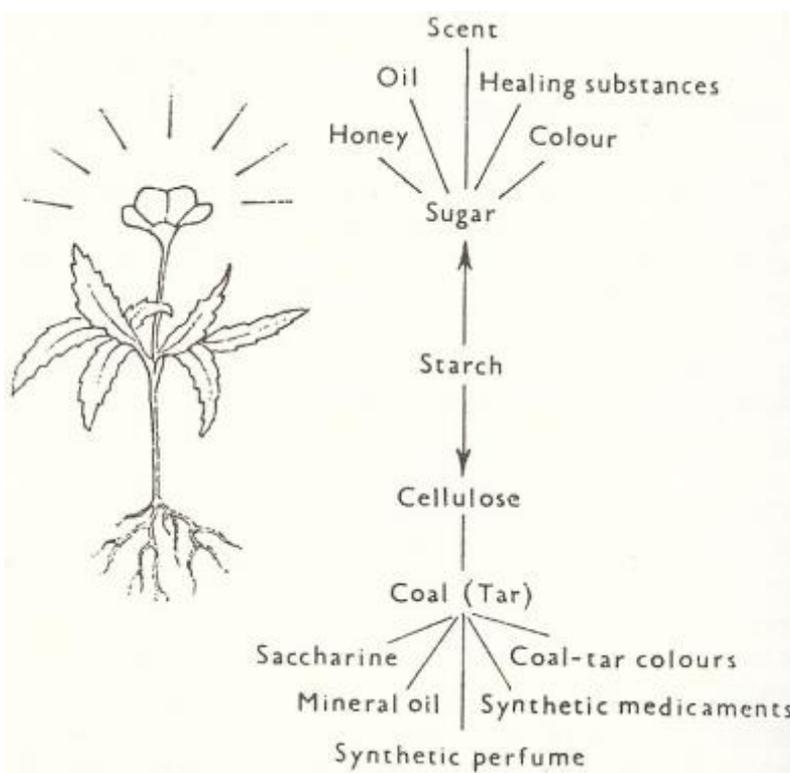
At school we were all shown how light is necessary for all organic life – combining with water, air and certain Elements to initiate processes such as the development of green leaves – this is the broad idea covering the minutiae of the chemistry and physics of plants. Having (hopefully) just finished reading *Book 3* on atomic structure, if we now look at the arrangement of the key Elements making plant life possible, including the Chlorophyll molecule responsible for the greenness of plants, as we would expect, Carbon, Hydrogen and Nitrogen form the base, with the crucial addition of Magnesium. The field of organic chemistry can be defined as the study of

combinations of the elements Carbon, Hydrogen and Oxygen in molecules of simple to ever-increasing complexity – key examples relevant to plants cited by Hauschka I have brought together under *Appendix C*. He explains how these three Elements form the basis of plant life, with others coming in to play specific roles (for example, Magnesium’s ability to attract light).



**III. 4- 33: The foundations of organic life rest on three main Elements – from Hauschka<sup>16</sup>**

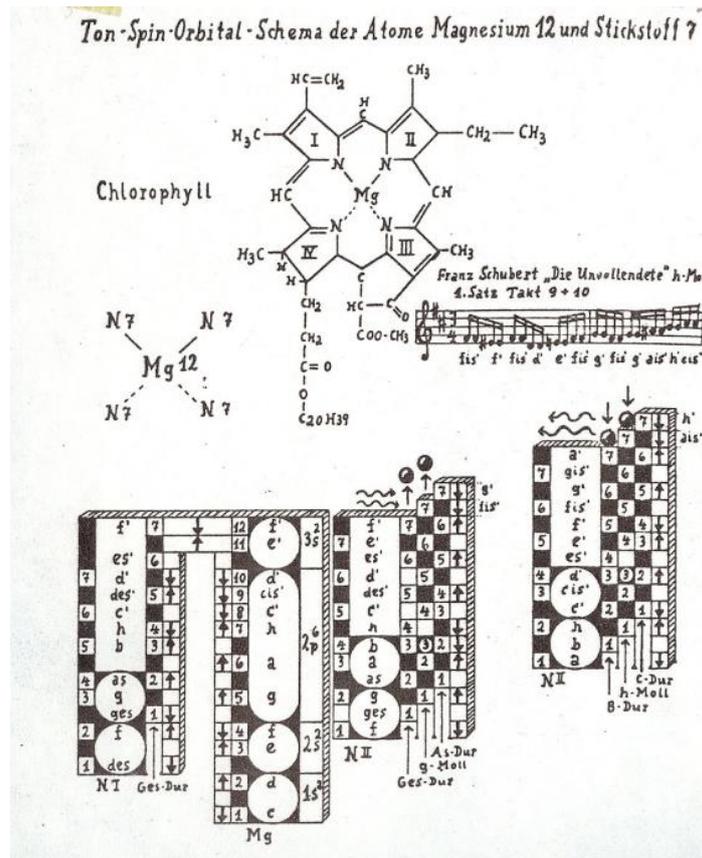
Hauschka neatly sums up the plant in terms of the variations of substance manufactured at different levels of its vertical octave, consisting of the increasingly complex organic molecules given in *Appendix C* (the addition of Nitrogen to these chains makes proteins):



**III. 4- 34: By-products of the plant octave in organic CHO molecules of increasing complexity**

We have yet to study molecules (*Book 5*) but who better to demonstrate the music of Chlorophyll than Krüger, many of whose analytical graphics we used in our previous book:

<sup>16</sup> Rudolf Hauschka *The Nature of Substance* 1966 (remaining in print thereafter)



**III. 4- 35: The musical notes of the Chlorophyll Molecule, which adds Magnesium to the CHO triad – from Krüger *Das Universum Singt***

Looking at his diagram, we must mentally add the presence of water and the Sun, without which the molecules would not form. All plants (even plankton) need chlorophyll in order to photosynthesise (process sunlight) and breathe – we in turn need their Oxygen during the day so we can breathe (in hospital wards flowers are taken out at night when they give off Carbon Dioxide). A fuller analysis of how this process works is given in the chapter on molecules.

We have seen already that Magnesium is not the only Element used in the plant ‘factories’ at each level of their octave, and here Hauschka (yet another Theosophist!) has made a huge and detailed contribution to our understanding of the role of plants in our lives, most especially through his explanation of how plants – according to different Elements absorbed - in precise ways act as relay stations between the Zodiac Signs and Planets and life on Earth (his work on animal biology we leave until **Book 6**, also full of important insights). So soon after our previous book about the properties of atoms and the Periodic Table, with its own octaves still fresh in our minds it makes sense at this juncture to follow some of these links - with his help.

***PLANTS AS CHEMICAL TRANSFORMERS AND CARRIERS OF THE ELEMENTS***

Different plants specialise in acting as the ‘carriers’ of other, sometimes quite rare, Elements: an obvious example is spinach with its high levels of Iron, important in the diets of those suffering iron deficiency, a component of red blood cells; seaweed which manufactures Iodine,

crucial for a healthy thyroid gland; Lithium is found in tobacco and Titanium in roses. More than this, plants break down atoms at the proton level (whose number, we know from the previous chapter, determines the nature of each element) and rearrange subatomic particles into Elements of higher or lower number, as long as the atomic numbers involved are exactly divisible, or linkable with soil or atmospheric substances or the enzymes found in animals, higher plants and the micro-organisms which live round plants like fungi, actinomycetes, bacteria and microscopic algae. In this lies the entire magic and importance of plants, which need no expensive or complicated scientific instrumentation to undertake this natural reprocessing of the Elements. In plants this usually happens amongst the first 20 Elements of the Periodic Table - whose proton numbers are simple - and to a lesser extent within the following 10 (we know from *Book 3* that the alchemists' secret of transmuting one element into another has been solved by modern physics and chemistry as simply a matter of changing the number of electrons and/or protons in their atomic structure). The oak tree, for instance, which grows naturally in granite and schist regions where the soil is rich in silica, can nonetheless show up to 60% calcium in its ash, and from other experiments it has become clear that plants in general easily transmute silica into calcium. As the scientist Lawrence observed, 'Perhaps plants are the true extra-terrestrials, for they converted an early mineral world into a habitat suitable for Man by processes that border on near-perfect magic!'

The best-known writer on this subject, C L Kervran, described what goes on in his best-known book in English, *Biological Transmutations*. He was aware of the work of Anthroposophists such as Pfeiffer, who continued Steiner's work and noted that lawns only start to produce daisies when there is Calcium deficiency in the soil, since the daisy plant is rich in this Element: it has come from somewhere, but not the soil. Thus when the daisies die the soil is replenished with their Calcium. This is the rationale behind leaving fields to lie fallow, to regain their fertility naturally, for whatever plants spring up naturally when the field is left to its own devices is an indicator of what the soil deficiencies are, and they will contain the Elements to make it whole again if they are left to die where they are. Similarly, algae create Iodine of themselves for it is not present in the sea, as formerly thought. Kervran himself showed that plants return far more Potassium to the soil from their own structures than was initially present there, and other experimenters showed that plants such as lucerne can synthesise their own Magnesium even where none is present in the soil.

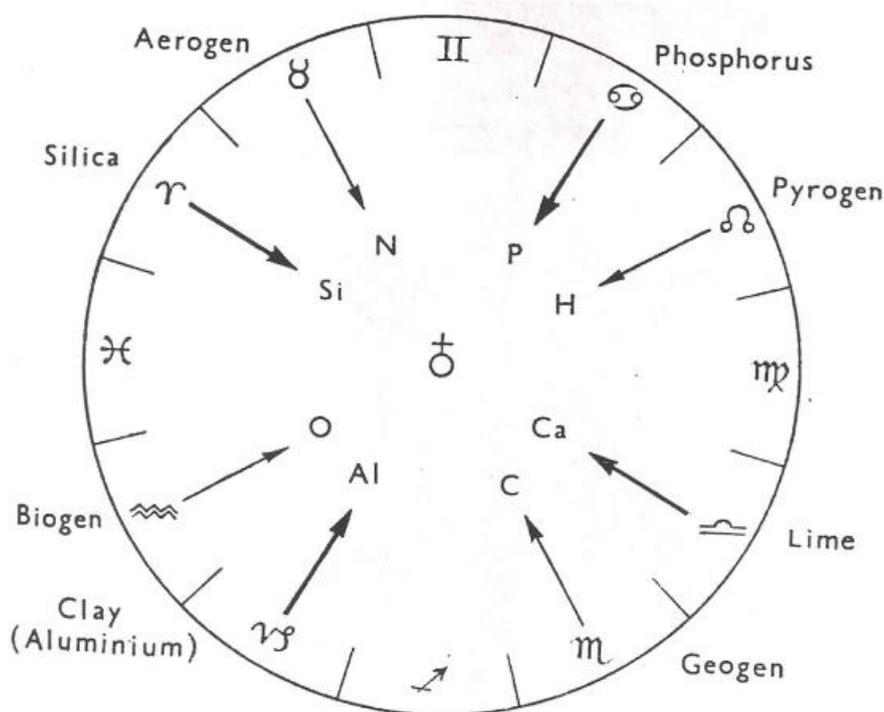
Thus plants not only have the power to transform living molecules, but transmute atomic structure itself. Hauschka undertook several experiments showing how plants and animals during their digestive process transform Elements into others. An example is the high amount of Calcium Carbonate in bird droppings, which is what is left after other components of their food have been digested. He also discovered that some people's metabolism can cope with, say, high levels of alcohol or protein, transforming them into more nutritious substances

(meaning that some people are less affected by seemingly harmful diets than others). Of course plants provide food from all stages of its octave - roots, stalks, leaves, flowers, fruits and seed/grain – usually transformed into various aspects of our body cells. These truths are proved by the more extreme examples - such as poisons which are dissonant to human cell structures and bring the body to its end, or the psychotropic plants which actually unlock memories held within the body cells or open them up to resonances in higher worlds. These are two vast themes which depend, in the first case, on deliberate mismatches between biological cells and in the second, on opening up latent correspondences – but precise dosage is crucial.

ZODIAC SIGN	ANCIENT ELEMENT	CHEMICAL ELEMENT	SYNTHESISED NAME
Aquarius	Air	Oxygen	Biogen
Taurus	Earth	Nitrogen	Aerogen
Leo	Fire	Hydrogen	Pyrogen
Scorpio	Water	Carbon	Geogen

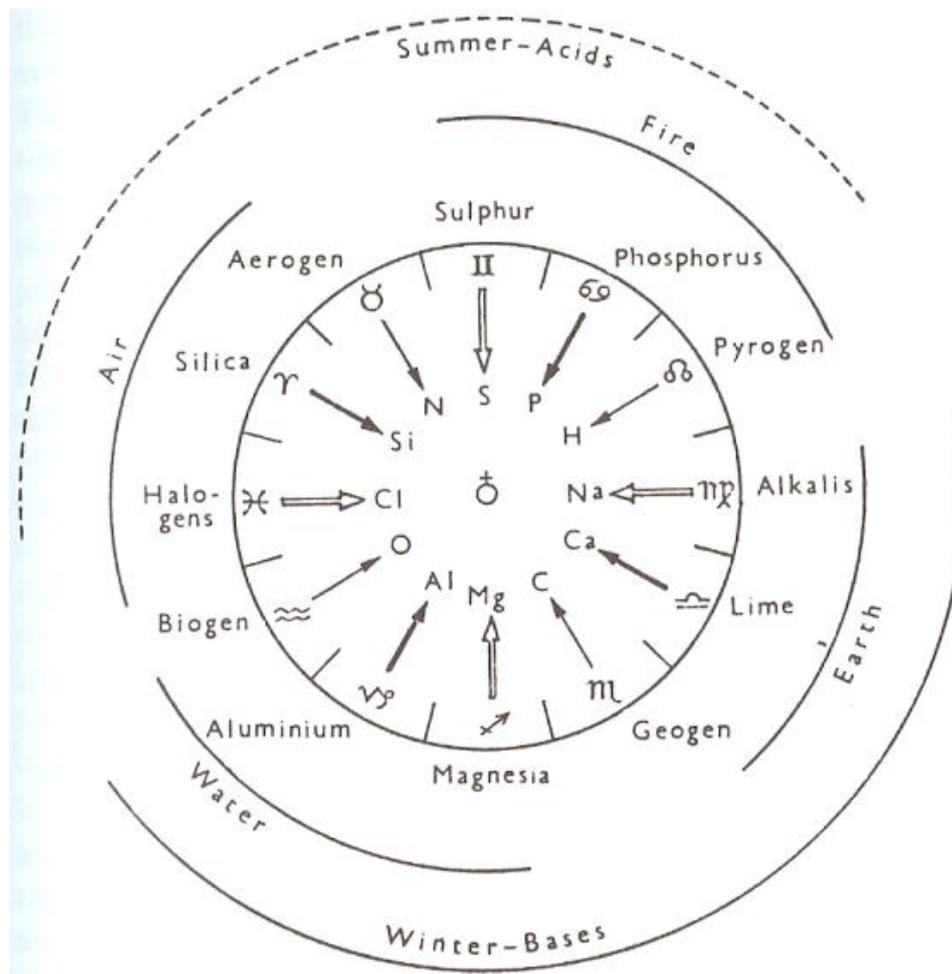
**III. 4- 36: Hauschka's Atmospheric Cross**

Hauschka saw the abundantly occurring plant Elements - Carbon, Hydrogen, Oxygen and Nitrogen – as the 'carriers' of the higher-plane ancient Four Elements of the ancient world, renaming them as above, and assigning them to the Cardinal Signs in what he called the Atmospheric Cross. His arguments for doing so make good sense, and though I would apportion these elements to the signs slightly differently, for reasons of space I must leave it to the reader to read his full argument and come to their own conclusions.



**III. 4- 37: Hauschka's Cardinal Atmospheric Cross and Geospheric/Mineral Cross combined**

The same holds true for his assignment of another four Elements found in soil (Silica, Phosphorus, Calcium and Aluminium/Clay) to the present-day Solstitial-Equinoctial Cross of Capricorn/Cancer and Aries/Libra, naming it the Mineral, or Geospheric, Cross. These are basic soil ingredients essential to plant growth and absorbed for further assimilation in higher biological structures. This leaves what he calls The Hydrospheric/Oceanic Cross of Virgo/Pisces and Gemini/Sagittarius, to which he assigns the Elements Chlorine/Sodium and Sulphur/Magnesium, essential to acid-alkali interplay. All three crosses he brings together in the next diagram which boils down to the group of twelve essential Elements in the realm of plant life (sometimes attached to others of very similar nature) that can be understood as keyed into the Zodiac and the vehicle for their influence. The reasons for these allocations take up half his book, requiring attentive reading – and to me make sense overall as an exciting way of associating particular Elements with the Signs, mostly plausible apart from one or two swaps that I personally might make (I would give Silica to Capricorn and Carbon to Taurus, for instance) – and you will have your own thoughts. It is an exercise looking in the right direction, and some matches (Magnesium to Sagittarius and Oxygen to Aquarius, for instance) ring true.



**III. 4- 38: Hauschka's Hydrospheric Cross - combined with the Atmospheric and Geospheric Crosses into Summer/Acid and Winter/Alkali halves - completes his Zodiac of the Elements, each allocated in the light of plant growth in its atmospheric and soil contexts**

We can lay out the information in this interpenetrating triad of Crosses into a list of zodiacal Elements in table form - as below. We are not quite ready (not until after *Book 7*) to go further and allocate the Elements to the Cosmokrator colours, but when in due course I make a variant Cosmokrator model for this, their known colours in pure or salt form will probably help to fine-tune Hauschka's allocation of them to the Signs.

SIGN		ATMOSPHERIC/ GAS CROSS	GEOSPHERIC/ SOIL CROSS	HYDROSPHERIC/ WATER CROSS	ANCIENT ELEMENT
♊	PISCES			Halogens/Chlorine Cl	AIR
♈	ARIES		Silica Si		
♉	TAURUS	Aerogen/Nitrogen N			
♊	GEMINI			Sulphur S	FIRE
♋	CANCER		Phosphorus P		
♌	LEO	Pyrogen/Hydrogen H			
♍	VIRGO			Alkalis/Sodium Na	EARTH
♎	LIBRA		Calcium Ca		
♏	SCORPIO	Geogen/Carbon C			
♐	SAGITTARIUS			Magnesia Mg	WATER
♑	CAPRICORN		Aluminium Al		
♒	AQUARIUS	Biogen/Oxygen O			

III. 4- 39: Hauschka's Zodiac of the Elements

**ZODIACAL CLASSIFICATION OF THE ENTIRE PLANT WORLD**

When looking at other approaches prior to the post-Linnaean/post-Darwinian era, Lilly's approach (described in the next section) is now forgotten, and in the light of Evolution theory Arthur Young<sup>17</sup> attempted to fit the entire plant world along typological lines into one grand octave of seven main types, with subdivisions relating to music, but not to astrology. In this he follows Tippo, who classified it into 12 phyla, i.e. into an octave divided into semitones (as discussed in *Book 7*), while Bold in *The Plant Kingdom* (quoted by Young – my *Appendix A*) was happier dividing it into 24 divisions, which therefore fits into the 22-25-fold microtonal octave we consider in *Book 8*. Neither Tippo nor Bold relate the plants to the planets nor the zodiac, but certainly Young tried to relate them to a grand octave of plant creation in musical terms, toying with the best possible subdivisions initiated by them. We have only the modern astrologer W B Crow<sup>18</sup> (below) attempting to place whole categories of plants in their order of

<sup>17</sup> *The Reflexive Universe* 1977

<sup>18</sup> *The Occult Properties of Herbs and Plants (Paths to Inner Power)* 1977

<b>Pisces</b>	Algae and seaweeds
<b>Aries</b>	Lichens – the first signs of land plant life
<b>Taurus</b>	Fungi and truffles
<b>Gemini</b>	The mosses, which mainly live on air
<b>Cancer</b>	Damp-loving ferns, horse-tails and club mosses
<b>Leo</b>	Cone plants
<b>Virgo</b>	All grasses and cereals
<b>Libra</b>	The most beautiful flowering plants such as roses and lilies
<b>Scorpio</b>	Succulents and palms
<b>Sagittarius</b>	Great forest trees
<b>Capricorn</b>	All plants with clearly defined, separate petals
<b>Aquarius</b>	All plants with petals unified into one shape, such as orchids or arums

**III. 4- 40: Crow's allocation of Signs to orders of the plant world**

evolution against the zodiacal signs, which seems to run along the right lines – though some matches, as for Taurus and Gemini, for instance, fit – while others do not (I would give Capricorn to trees). Again, it is open to fine-tuning by us in the light of our own experience.

### **PLANTS, PLANETS AND SIGNS**

In the last third of his fascinating book Hauschka points out how the *metals* as a family do not appear to fit into the overall scheme of the Periodic Table properly, standing apart from the common Elements that together almost entirely account for the fabric of Planet Earth and its plant life. He discusses the key metals and their well-known association with the Octave of the Planets, which (ahead of **Book 7**) inasmuch as they concern plants we must take a closer look at next, but we will need to gradually build towards his thinking on this.

Primarily plants are dependent upon the Sun, technically a star – and we earlier on considered the prime link between plants and the Moon. In fact, plants are clear indicators of *all* planetary influences bearing down upon Earth if we know how to read them, and the fact that the same word is used for both underlines how closely their characteristics must interface. In other words, the notes of the music of the spheres (we have to wait for **Book 7** to study this properly) are particularly well captured in plant forms and essences. Mediaeval tracts pointed out literally obvious planetary signatures in plants, such as colour (red for Mars) or shape (slow-growing and solid trees bear the formative influence of Saturn). Paracelsus, who learned from folk herbalists from many parts of the world, also immersed himself in the world of nature, recommending that the physician should sit quietly in a meadow and notice how 'the blossoms

follow the motion of the planets, opening their petals according to the phases of the Moon, by the cycle of the Sun, or in response to distant stars'. Certainly, different flowers open and close at different times of the diurnal round - so accurately that Linnaeus in the 18C devised a floral clock to tell the time by, from the phasing of opening or closing flowers. Attempts have been made since to plant out such a clock in public gardens, but it is difficult to assemble all the right plants in flower at the same time, and their times vary by latitude. Linnaeus' clock was accurate only for Uppsala at 60°, while other clocks were devised by Kerner for Innsbruck at 47° and Brewer for England at 51°. The fact that natural cosmic measures can be taken from the structure, size or behaviour of plants is explored further in *Book 14* bringing together all kinds of natural measures that mankind has used to regulate their life.

Again it is the Anthroposophists who undertook exhaustive modern scientific experiments on the effects of planets other than Sun and Moon on plants, starting with Agnes Fyfe<sup>19</sup> who did hundreds of experiments on the effect of Mercury on mistletoe, iris and hellebore, using the sap of these plants collected at a particular time of day, leaving it to rise up filter paper, then capturing its rising patterns by standing the same cylinders of paper in gold, silver or mercury salt reagents twenty-four hours later, the same method as for the Moon experiments. She discovered that whenever Mercury reached inferior or superior conjunction with the Sun, instead of rising, an empty cup shape appeared in the sap stain, showing rising sap was being inhibited. The effect was also noticeable when Mercury came into certain signs in relation to, or in conjunction with, other planets, most markedly the Moon.

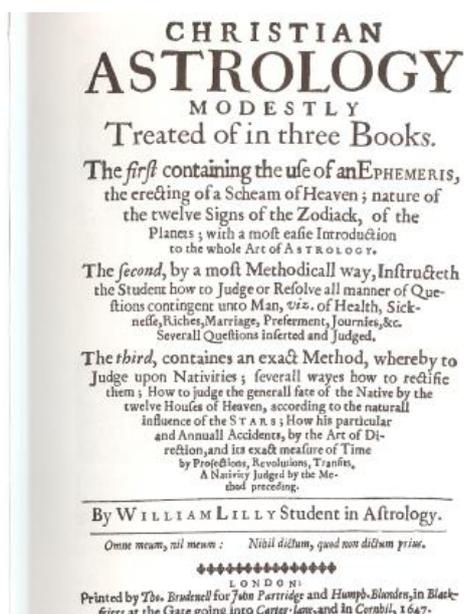
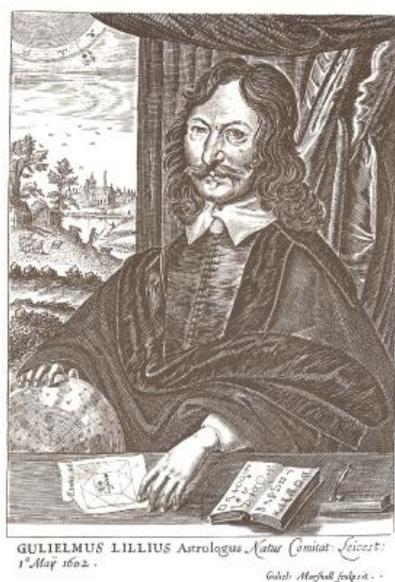
She came to the conclusion that at those moments the influence of Mercury was to stunt growth (we are familiar from astrology that Mercury is regarded as sexless, or androgyne). It is Mercury's position in relation to the all-potent Sun that is, however, particularly marked: 'the close interaction between the conjunctions embraces the whole year and moderates - in the sphere of formative forces - all the stages of unfolding life in the plant that are dependent on the Sun'. Of course, one has also to bear in mind that Mercury follows a chain of inferior and superior conjunctions with the Sun that move progressively forward from year to year, so plant life will in turn also be modified during the overall rhythm of the 88-day Mercury Sidereal cycle. It has also been suggested that the general Mercury influence is to do with variety - of a hundred beech leaves picked from one tree, not one will be exactly the same as its partner.

We are reminded that Mercury's caduceus of two twisting snakes round a staff was the ancient symbol for the medical profession, and Agnes Fyfe was particularly interested in the fact that Mercury's dampening effect could be harnessed in medicinal plants - notably mistletoe gathered at those growth-inhibiting moments and administered to cancer patients to spread a resonance to cells that would also inhibit human cell proliferation. She referred to one of Steiner's own

---

<sup>19</sup> 'The Signature of the Planet Mercury in Plants' in *The British Homoeopathic Journal* LXII,4-LXIII,2 1973-4

lectures where he said, 'all the parts of the human body that have the strongest tendency to unfold cellular nature... need especially to remain receptive to the proper influence of the planet Mercury. These parts, which lie in the abdomen between the heart and the excretory organs, are quite exceptionally dependent on the capacity to maintain the cellular principles within legitimate bounds, and yet to prevent unlicensed growth. They must remain receptive to the paralysing, devitalising Mercury influence. Were they not to maintain the state of balance, the cellular activity of these organs would at once become proliferative'. And then he went on, 'Our Earth would perpetually proliferate in new growths, in carcinomas, if this proliferation were not balanced by the mercurial process, the action of which on Earth is maintained from extra-telluric regions by Mercury'. Not surprisingly, the two Signs traditionally ruled by Mercury are considered infertile: Virgo and Gemini – as also Scorpio (for different reasons, to do with self-retention). Through Fyfe's Mercury experiment alone a tantalising glimpse is given into the potency each planet must give to plants making up that middle realm of organic life on which we depend, perhaps more fascinating than finding out our own individual fate in our horoscope. As late as the time of Cromwell, in Britain an astrologer such as William Lilly<sup>20</sup> would from a person's horoscope diagnose their illness and the necessary healing plants to allay it. All plants,



**III. 4- 41: Print of William Lilly in the frontispiece to his book (his painted portrait hangs in the Ashmolean Museum, Oxford)**

but especially herbs, were seen as the special vehicles of planetary essences – such as mistletoe of the Moon, nettle of Mars, or bay the Sun. This vast subject is worthy of its own book: just a few individuals today are trying to revive this area of healing, which goes further than simply using herbs for their known straight medicinal powers, given it takes into account the sick person's horoscope *and* plants' astrological correspondences. I have drawn on Lilly as a

<sup>20</sup> William Lilly *Christian Astrology* 1647 and 1659 (facsimile edition ed. Geoffrey Cornelius 1985)

general guide for the planet signatures in plants that follows next, since the 17C view of the planetary qualities of plants is more comprehensive than the Anthroposophists have been able to provide, living, as they do, in an era which demands experimental proofs for even the most obvious assertions of ancient tradition.

No	SIGN	COUNTRY	PLANT	ANIMAL	SUBSTANCE
0	ZODIAC, YEAR, UNIVERSE	EUROPE & THE NEAR EAST	LILY	SERPENT	WATER
1	AQUARIUS	EGYPT	DATURA	LEOPARD	LAPIS LAZULI
2	PISCES	LEVANT	SEAWEED	FISH	SKIN/FLESH
3	ARIES	ARABIA	ALOES, BULB FLOWERS	FALCON KITE, RAM	IRON
4	TAURUS	IRAQ/EIRE	GRASS	COW/BULL, SOW	EARTH
5	GEMINI	SYRIA	ORANGES	CURLEW, MONKEY	MIRROR
6	CANCER	PERSIA	CEDAR, PINES	SCARAB, CRAB	PEARL
7	LEO	CRETE & CYPRUS	PALM TREE	LION	GOLD
8	VIRGO	GREECE	OLIVE OLEANDER	SPIDER	WOOL
9	LIBRA	JORDAN	FRUITS	DOVE	FEATHER
10	SCORPIO	EGYPT	CACTUS	VULTURE	TURQUOISE
11	SAGITTARIUS	CENTRAL ASIA	ROSE	HORSE/DEER	FIRE, FLAME
12	CAPRICORN	ANATOLIA	FERN	NANNY GOAT	FUR
13	CIRCUMPOLAR CENTRE	CANAAN AND PALESTINE	AND OLIBANUM	CROCODILE HIPPO, BEAR	BLACK ONYX
ALL	POLAR AXIS	MEDITERRANEAN SEA	HELLEBORE	LION & PREY <small>(see www.layish.co.uk)</small>	BLOOD

**III. 4- 42: Table of Correspondences between plants, animals, countries and substances in the 17C perspective of William Lilly**

Lilly’s generation assigned the countries around the Mediterranean basin to the Zodiac Signs<sup>21</sup> (a geo-mental universe probably still relevant to today’s sense how far ‘interdependency in world affairs extends - see III. 4- 49): the table above is based on his alignments to plants, animals and substances that you might well wish to adjust in the light of your own expertise and experience: some seem to fit the nature of things, while others seem more intuitive, needing fine-tuning. Taking the case, say, of Saturn, it is easy to see how it shows up in tough woody perennials with a long life, such as trees, or plants which have grey or dull foliage and insignificant flowers. But where, according to Lilly, Saturn plants often taste unpleasant and smell dank, including poisons such as wolfbane, hemlock and deadly nightshade (and, we now

<sup>21</sup> A geographical version of the Cosmokrator model based on this table is on my work schedule for a few years hence

know, the potato, from the same nightshade family, poisonous until cooked), and assigns to Saturn also hellebore, parsnip, verbena, spinach, yew, willow and cypress - whose overall quality is sadness and solemnity - in my judgement I would leave out verbena and spinach.

In his book Lilly gives many more examples for each planet, worth looking through. For him, Jupiter governs herbaceous perennials which last about twelve years and its signature is often the fourfold arrangement of leaves or flowers. It governs plants with strong, definite flavours and full forms, such as nutmeg, strawberry, borage, wheat, violets, pomegranate, mint, saffron, and fruit trees such as cherry, mulberry, olive, hazel and pear. The general character of Jupiter energies is generous and benevolent, where those of Mars are spiteful and even foul-smelling. Lilly says Mars plants have pointed or serrated leaves with a burning or bitter taste, examples being nettle, thistle, brambles, onion, garlic, mustard, pepper, ginger, radish and any prickly trees. Plants predominantly red or having conical roots are also said to channel Mars energies.

Sun plants usually have a balance in taste between sweet and sour with pleasant and vigorous odour – such as rosemary, marigold, barley, aloes, elm, ash, laurel, cedar and orange and lemon trees. All annuals come under the measure of the Sun, of course, and are usually yellow or orange in colour, though of course all plants come under the Sun in a general way. Venus contributes to all sweet herbs and white flowers, according to Lilly, and plants with smooth-edged leaves. Not surprisingly it rules the most beautifully formed flowers such as rose or lily, and luscious fruits such as apple, peaches, apricot and plums, as well as almonds and millet. Plants show the Mercury strain in anything stunted or squat, or possessing seedpods, Lilly says, given, as already seen above, that Mercury is a brake on growth and inimical to their expansion. Plants where the Moon predominates, on the other hand, have thick, juicy leaves and fruit, such as cucumber, melon and lettuce and, if trees, are round and shady. But, as with the Sun, there is no plant uninfluenced by the Moon.

The table above simply correlates the zodiac *Signs* very generally with plants, so building on it I drew up another table (next page) to include their ruling planets<sup>22</sup>. (with slightly different allocations). It is also possible to match individual Stars to plants – one is the dramatic 51-year Sirius cycle of the bamboo. Sirius is a binary star (Sirius A and Sirius B) that circles round itself, one at times obscuring the other, accounting for fluctuations in its brightness. It takes 51 years for the pair to complete one circuit round each other, and although bamboo, a type of grass, at first glance in a garden setting looks like a perennial evergreen, in fact in year 51 of its life it finally flowers profusely, goes to seed and then dies – I bought one bamboo which turned out to be at year 49 of its cycle, since two years later it went through this process and I was left with a dead bamboo! For other jungle plants with unusually long life cycles, see also *III. 4- 50*.

---

<sup>22</sup> In due course I plan also to give form to this table in a variant Cosmokrator model covering key plants and planets.

COUNTRY	PLANET	SYMBOL	SIGN	STARS	ANIMAL	SUBSTANCE	PLANT
0 MIDDLE EAST	EARTH		L&P	Polar Axis; World	Lion & Prey Hippo	BLOOD	Hellebore
1 PERSIA	MOON NODES	 		Cancer	Scarab Crab Tortoise Dragon	PEARL	ALOES BULBS
2 LEVANT	MERCURY			Gemini	Curlew Baboon	MIRROR	CITRUS
3 CRETE	PAN			Taurus	Cow Sow	SOIL	GRASS
4 ARABIA	MARS			Aries	Ram, Ewe	METAL	LILY
5 LEBANON	NEPTUNE			Pisces	Fish Serpent	SKIN	SEAWEED
6 SYRIA	URANUS			Aquarius	Leopard	LAPIS LAZULI semi-precious stones	DATURA OAK and deciduous trees
7 ANATOLIA	SATURN			Capricorn	Goat Fox Oryx Ibex Gazelle	HORN IVORY	FERNS MUSH- ROOMS
8 JORDAN	JUPITER			Sagittarius	Horse Deer	FLAME	ROSE
9 ISRAEL JUDAH	PLUTO			Scorpio	Vulture Scorpion	SEMI- CONDUCTORS	CACTUS
10 GREECE	MANKIND			Libra	Dove Woman	FEATHER	FRUIT
11 LIBYA	VULCAN			Virgo	Spider Octopus	WOOL	OLIVE OLEANDER
12 IRAQ	SUN			Leo	Lion(ess)	LIGHT	PALM
13 EGYPT	ORION			Sirius Zodaic Year	Phoenix, Ibis Serpent	WATER DIAMOND all precious stones	CEDAR
14 EUROPE	POLE			Circum- polar Stars	Bear Boar Jackal Croc	FUR	PINE and all conifers
15 MALTA/ MED. SEA	VERNAL POINT			Earth Hades	Cow Goat	BLACK FLINT	ONYX Bio-sphere
16 GLOBE	SOLSTICES			Equinoxes	Two lions Two goats	LIGHT RAY	Ionosphere

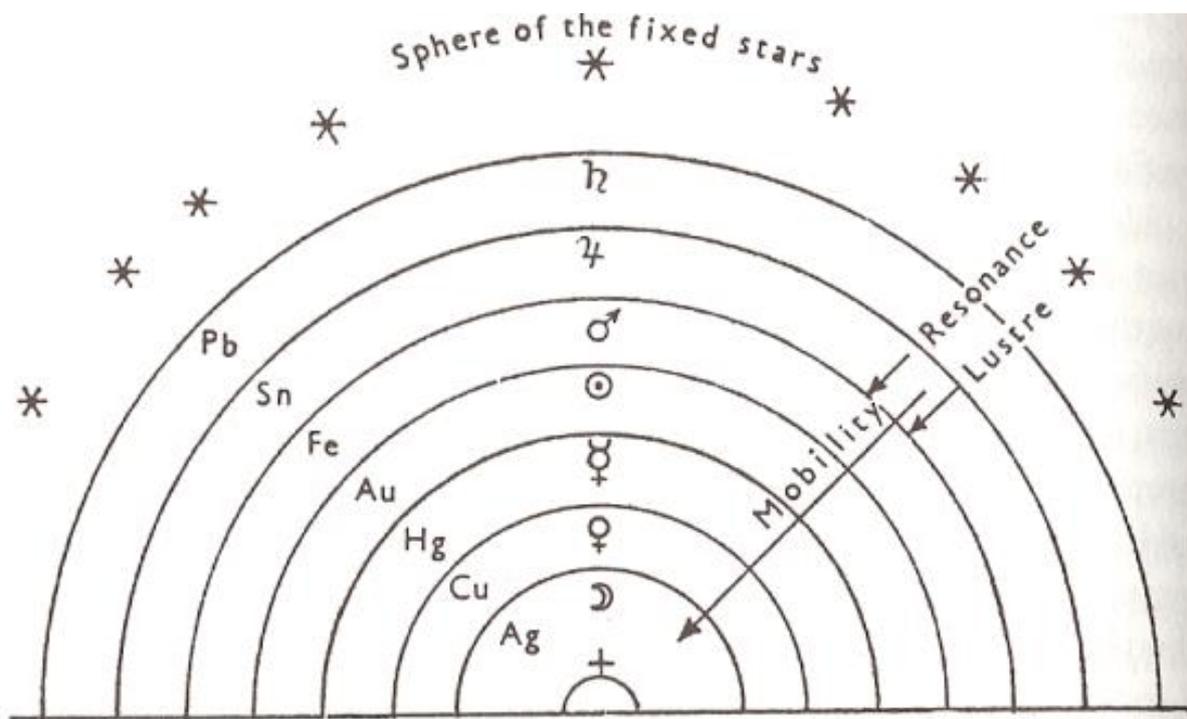
III. 4- 43: Assignment of plants, animals and substances to Planets and Stars

This second table includes the sigils for both Signs and Planets - well worth trying to learn before we get to **Book 7**. I have simply put in the most obvious examples as a starting platform. A host of variants for this geography, birds, animals, plants information (and much more) are given by Lilly in Part I of his grand tome (see the title page in *III. 4- 41*) – certainly a book worth purchasing if you are after the detail not to be found elsewhere (he himself drew

on a plethora of sources from the ancient and more recent Islamic worlds). Again, although there is no doubt that in general there are significant matches, when we come to composite or borderline types of plants it is not so easy to place them, and in the plethora of astrology books available the allocation of plants to planets and signs often seems arbitrary. So to some extent it is open to the reader to draw up their own table relevant to their own geographical perspective and experience for it to ring true enough to be able to work with.

**HAUSCHKA ON PLANTS, PLANETS AND SIGNS**

Hauschka starts on familiar ground in associating planets with the metals found threading through the more common minerals of planet Earth, since there is a long and respectable tradition going back to the Greeks and Babylonians, and probably a good deal further back in time, as we will explore fully in *Book 7*. Since planets affect plants, beyond the atmospheric, soil or acid-alkali dimensions of Hauschka’s three Crosses (*Ill. 4- 37 & Ill. 4- 38*) it follows that there is an innate metallic correlation to the plants they influence as well. He concludes, ‘The formative impulses at work in substances of the mineral earth, the hydrosphere and the atmosphere spring from the Zodiac – *whereas the impulses active in metals originate in the planets*’ (giving rise to a host of different colours).



**Ill. 4- 44: Hauschka’s traditional matching of the metallic Elements to the Planets, to be borne in mind when following Lilly’s information on the planetary signatures of plants**

In *Book 3* we discussed some of the problems in the arrangement of Elements in parts of the Periodic Table, in that it might make more sense to have a three-dimensional arrangement of its octaves – or indeed understand certain sequences as mini-octaves within a particular Element or Element family. In Hauschka’s chapter, ‘The Brothers of Iron’ the minor metals often



an octave of organic substances to the land to draw down more strongly all the planetary and zodiacal influences<sup>23</sup>. They are on sale from the Society in a specially prepared state, six of them being common herbs – as follows:

<b>Saturn</b>	Valerian stored in water, in season
<b>Jupiter</b>	Dandelion stored in a cow mesentery buried in the ground in winter
<b>Mars</b>	Nettle stored in the ground both in winter and summer
<b>Venus</b>	Yarrow stored in a stag's bladder above ground in summer, below ground in winter
<b>Mercury</b>	Chamomile stored in a cow intestine in the ground in winter
<b>Moon</b>	Oak bark stored in a cow skull under water in winter

***Ill. 4- 46: The Biodynamic draw-down in agriculture of planetary influence by plant activators***

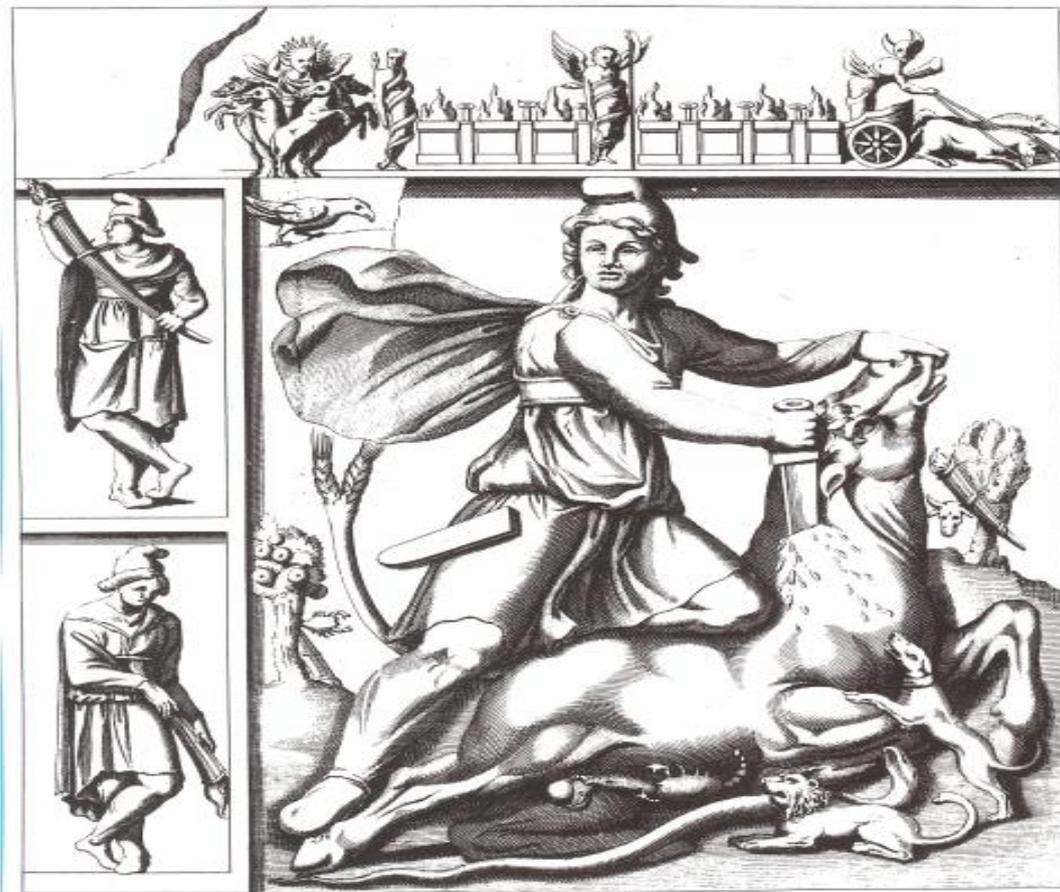
Finally, the Sun forces are to be concentrated in two ways. First, by storing cow dung (disintegrated plant forces that derived originally from the Sun) inside a cow horn (the densification of the primary Moon forces). When ready, this preparation smells sweet, and is mixed in homoeopathic proportions in large buckets of water stirred vigorously in a spiral direction which is said to encourage the germination, root development and early growth of the plant. Second, the powdered cow-horn itself (consisting mostly of Silica) is also stirred into a solution to help fix the forms of growth as they emerge. Once more, we have the full octave.

Biodynamic farmers see the homoeopathic nature of the solutions and long and vigorous stirring in spiral directions both ways as particularly important for the process. The solutions are then sprayed onto the land and its plants in a fine mist at favourable times of the year and are intended to enhance the transmission of healthy planetary energies into plant life. The choice of materials and the method of their preparation seems arcane, but given the larger world of morphic resonance within which they are working (they were using this method long before Sheldrake started to use this terminology), it is certainly a deliberate attempt to actively resonate at the interface between planets and plants - and certainly appears to bring about good results. Proof of the pudding is in the healthy crops resulting, and even if to the sceptic Biodynamic writings can be vague and unintelligible at times, these methods need trying. For the freeholder who has little time to follow all the information gathered by the Anthroposophists and apply it, the fact of the matter is that the Planets and Stars will be at work on Earth anyway, but with their methods of judicious astronomical timing and analysis of the Elements involved, as worked out by the Anthroposophists these accelerate and enhance their influence.

<sup>23</sup> See C B J Lievegood *Study Material issued by the Experimental Circle of Anthroposophical Farmers and Gardeners: The Working of the Planets and the Life Processes in Man and Earth* Stourbridge, Worcs 1951

### THE ANCIENT WORLD VIEW

The Biodynamic formulae must somehow have come down from ancient tradition – probably orally. Below is a version of the much-repeated Mithraic icon used in Roman times which sums up that mysterious connection between man, beast, plant and zodiac and can be traced all the way back to several third millennium BC seal designs showing leaves, or even trees, sprouting out of a bull. Cautes holding the lit torch held up and Cautapates the extinguished one dropped down represent Day and Night; the Week is symbolised by the seven fire-altars, the Sun and Moon cycles in their chariots at either end – and Time itself is expressed as a serpent coiling round a winged figure at the 3:4 division point of the days of the week.



**III. 4- 47: Engraving of a Mithraic iconostasis from Lajard *Culte de Mithras***

The Bull of the Year is the main focus of the picture, into whose front shoulder Mithras/Orion, God of the New Year, plunges his dagger to initiate Time at the Spring Equinox (a Zoroastrian concept) valid during the 2500-year era when the Sun rose in Taurus at the Vernal Point. The fact that plant life is dependent upon setting in motion this great cycle of Life and Death (Taurus in opposition to Scorpio) *is signified by the Bull's tail sprouting into two wheat ears*. The concentration in Biodynamic farming on cow manure - and the cow horn, skull and innards as storage vessels – looks to this central truth. In the background to the right, the bull-head of Taurus is set against a tree with its first shoots announcing the birth of the Earth at Spring,

whilst on the left of the central group Scorpio marks Autumn as a fruit-laden tree (scorpion also nips the bull's testicles, referring to seed formation – meaning that ultimately the death of plant life in the end gives promise of its resurrection).

As far back as Neolithic farming cattle blood and bones were used as fertilisers (blood and bone fertiliser can still be purchased as an organic mixture today), part of the rationale behind the blood sacrifice of living beasts in all ancient world religions, where blood was channelled from their cut throats into the ground (and, indeed in some cases drunk by the officiants - as the Masai tribe still does today). Mithraism was a late manifestation of Zoroastrianism, the ancient religion of Persia and its Magi adopted by Roman soldiers posted to the Middle East, itself is a millennia-long religion still practised today in somewhat watered-down form, pre-eminent in centring on the influence of the planets and stars on Earth. Of its Seven Levels of Creation, for plant-life the priesthood cultivated the sacred hoama/soma plant, brewed as a drink to be consumed at ceremonies at ceremonial turning points of the year (Spring in particular). The Hoama was worshipped as God and Protector of all Plants 'through whom the world possesses creatures', says their scripture.

The Third Millennium Sumerian narrative of Gilgamesh tells the story of his search for the Plant of Immortality – the fullest version of which was written on twelve clay tablets representing each Sign of the Zodiac as he travels through them during his long journey like the Sun. After many adventures (closely similar to those of his Western successor, Hercules) he finds the Plant, but at the very end tragically loses it to a snake while asleep. The successor to Gilgamesh and Hercules in Europe is the Green Man, Celtic and Saxon God of Plants, a blend of the God Pan with the plant spirits, a multivalent figure similar in meaning to the ancient near-eastern Gods Osiris or Tammuz whose resurrection, after the death of winter, is likened also to the new sprouting leaves of Spring – in the case of Osiris specifically of wheat sprouts.



**III. 4- 48: The Green Man – in stone on a cathedral boss, and in modern illustration**

We will come back to Pan at the end of the book: from our discussions above, the zodiacal allocation of Signs and Planets to particular plants and the Elements playing through them seems to demonstrate that biodiversity is inevitable, given it is already set down at the cosmic

level, and that if the symphony of Nature is to flourish in its full richness attempts to standardise plants, people or animals into fewer groups swims against the current of Cosmic Law - and must be avoided at all costs.

### **BIODIVERSITY**

So let us move on to consider the current arguments for biodiversity – these do not concentrate on the role of planets, stars and the Elements, but there is no stopping your making that connection and bringing them together at the back of your mind. Earth’s interpenetrating octaves are at issue here, with the planet itself sounding as Middle C with its own set of harmonics that manifest as mineral, plant and animal life, soil, atmosphere, biosphere, stratosphere and ionosphere - and intermediate stages between in all their graduated multiplicity. Plants are the median, crucial note in the great organism of Planet Earth, and it is they that help to create that atmosphere, so eloquently defended by James Lovelock<sup>24</sup>. His concept that the Earth overall is one living organism (*Gaia*) meets huge opposition from the Science establishment and their journals even today, mainly because its different departments are unable to think outside their particular box and look at Life Sciences wholistically. In contrast, Britain’s Astronomer Royal, Martin Rees of Trinity College, Cambridge, wrote the introduction to Lovelock’s 2009 book and Carl Sagan published him in his journal, *Icarus*.



***Ill. 4- 49: The Old World side of Planet Earth, on which the astrological Signs for the countries surrounding the Mediterranean Basin in Lilly’s world (Ill. 4- 42 and Ill. 4- 43) can be placed***

The starting point for Lovelock was the astonishing photographs of planet Earth taken from outer space. It comes over as *indeed alive and self-regulating in a huge process of homoeostasis* – precisely the view arrived at by Hauschka through his Planetary, Zodiacal and Elemental analyses – in the face of which careless (as well as well-meaning) human

---

<sup>24</sup> James Lovelock *Gaia: A New Look at Life on Earth* 1987 – and see also most recently *The Vanishing Face of Gaia: A Final Warning* 2009

intervention is in fact rarely helpful – as Monbiot (who we come to later) has shown. Lovelock's writings became a cult from as early as the 1970s, as he reminded us that Mother Earth to the Greeks was revered as the Goddess Gaia or Ge (the reverse of the ancient Egyptian Earth God, Geb who mates with the Sky Goddess above) – on which rests our folk epithet, 'Mother Earth'.

He worked in several different capacities at NASA, thus was right at source when the first pictures of Earth taken from outer space were coming through in the 1970s - the first time mankind was able to see Earth from the outside as a living, self-regulating organism, surrounded by the blue haze of its biosphere (in Hauschka's terms, blue is the signature of the presence of Oxygen and its compounds in both air (O<sub>2</sub>, CO<sub>2</sub>) and ocean (H<sub>2</sub>O) – the latter showing as deep blue). Green tracts of plant-life and yellow tracts of desert equally stand out as part of the picture. We are all now aware of how fragile Earth's protective envelopes are, and that the atmosphere itself is like a veil, now torn at the ozone layer and exposing us to the dangerous cosmic rays of the ionosphere. Taken as a single organism, Earth's inward breath is Carbon Dioxide during the day, expelling Oxygen as a by-product, and then at night in the absence of the Sun she breathes in Oxygen, giving off Carbon Dioxide as her outward breath.

Through the analysis of earthquake waves it has been found that different zones *inside* Earth transmit shock waves at different rates. Kayser writes, 'Now if one compares the radii of these zones with the string length measurements of the overtone series of the primary major chords, which is also a physical (that is, a natural) phenomenon, then we obtain a triadic structure of the inside of the Earth in which the measurements of the different earth layers, too, show a remarkable agreement with those of the chord numbers. ... the firm crust of the Earth falls into the seventh octave ... and becomes understandable morphologically as the 'condensation' of the rhythms proceeding from that point – Earth, one mighty chord!'

The biosphere and its contents in turn constitute an octave within the grand octave generated by the Planet, its crusts and envelopes, and it is now clear that cutting out certain sections of this rich array of mega-harmonics endangers the existence of the grander Octave overall. This is why cutting down large tracts of habitat vegetation, especially forests, and/or the pollution of the plant world by noxious gases or poisonous pesticides, let alone the killing of the creatures that feed on them being brought to extinction, has a knock-on effect on the health of the Earth as a whole. Bodies such as Greenpeace and individual writers like Edward O Wilson have made it their life work to defend *multiplicity and variety* of life forms on which the great consumers, the mammals (including humans) depend. It is interesting that God in *Genesis*, apart from specifying to Adam and Eve their responsibility for looking after Earth and its creatures, specifies that plants should be to them 'as meat' (it appears that being carnivorous was a consequence of The Fall, when expulsion from Paradise and its Plant Prototypes meant the entire animal world - including Adam and Eve's fleshly bodies – went into solid manifestation).

Now, developed world governments have biodiversity on their agenda, using it as a catchword to refer to the issue, even when not specifically aware of the array of notes and overtones involved - analysed by us so far in abstract form in music, geometry, atomic – and now plant-behaviour. Unfortunately, as Monbiot shows in his latest book<sup>25</sup>, human interventions do not always improve the holes appearing in Nature – indeed sometimes their methods exacerbate the worsening situation – mainly because Government officials do not always read specialist scientific information thoroughly enough, or even think to consult with them more closely for their advice (the curse of British amateurism in Government goes on). Monbiot's overall case is that we should leave at least patches of Nature untouched and leave it to take care of itself, because the resulting return of almost lost insect life and other small creatures is fast and often unexpected. This has led to a healthy movement (helpful also for Councils on low budgets) of leaving grass verges on motorways uncut, encouraging gardeners to let parts of their gardens go wild to encourage insects, hedgehogs and voles - and the introduction back to Britain of kestrels, beavers, wild boar, wild cats – and even wolves.

It is diversity that increases the likelihood of survival, for if plants are kept to one strain they become vulnerable to disease. Disease decimated the rice crops of Asia in the 1970s until they were re-crossed with the wild strain of a relatively feeble Indian variety which nonetheless had the genes to withstand the disease in question, and this resistant hybrid will keep the grain silos filled and starvation at bay for a few decades yet. When the coffee plants of South America were blighted by coffee rust the only thing to save them was crossing them with an ancestral form of coffee from Ethiopia which proved hardy enough to pull the South American coffee industry back from the abyss of disaster. In other words, Nature is generous in providing all possible combinations and variations, and although this may be taken metaphysically as a natural urge to display all unmanifest patterns, so, it turns out, does it have a major role in survival. Take the analogy of when governments make cuts in 'essential services': the services that remain also decline because they are not supported by the entire gamut, so there is a down-turning octave to this unravelling process, where even government cannot avoid reflecting cosmic law in its processes - as it always did in the ancient world.

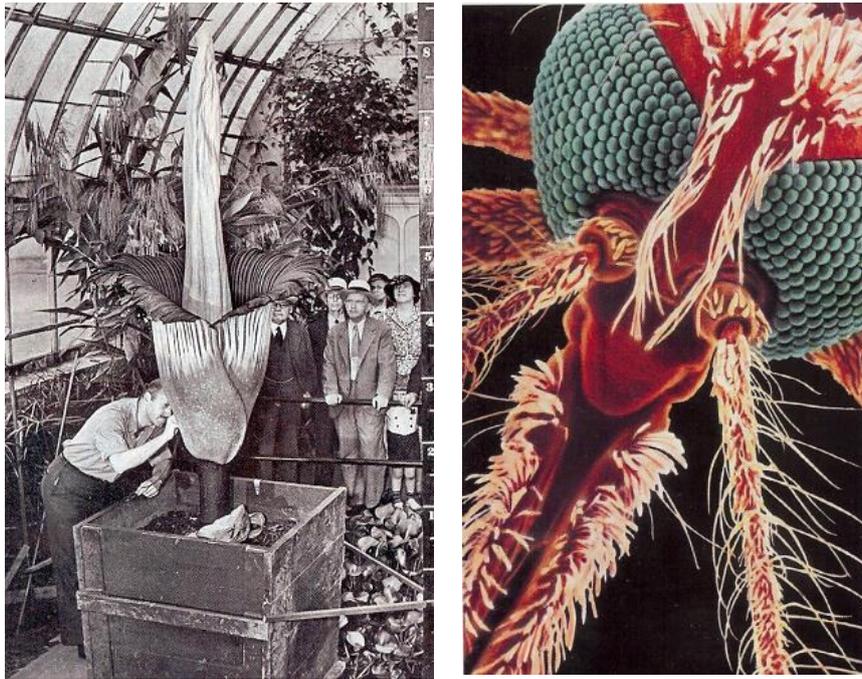
### ***THE PLANT-INSECT INTERFACE***

There are countless cases of plant and insect imitating one another in survival strategies, and countless hierarchies of harmonic manifestation within this dual world where plants are particularly prone to hybridisation due to the fact that they do not have one set of chromosomes in their genes as simple organisms and primitive plants have, nor two sets as humans have (one donated by the male and the other by the female parent) – but four, eight,

---

<sup>25</sup> George Monbiot *Feral: Rewilding the Land, Sea and Human Life* 2013

or even more sets. The variety of possible combinations available means they can form hybrids from parents of different species or varieties, which at the beginning was of huge evolutionary advantage to them - then exploited legitimately by the plant breeders. But this has now been taken to dangerous levels by the GM scientists, *for the simple reason that they want to go a step too far by completely cutting out interaction between plants and the insect world* - viewed simply as pests. Because of their common origin this fundamentally breaks Cosmic Law apart.

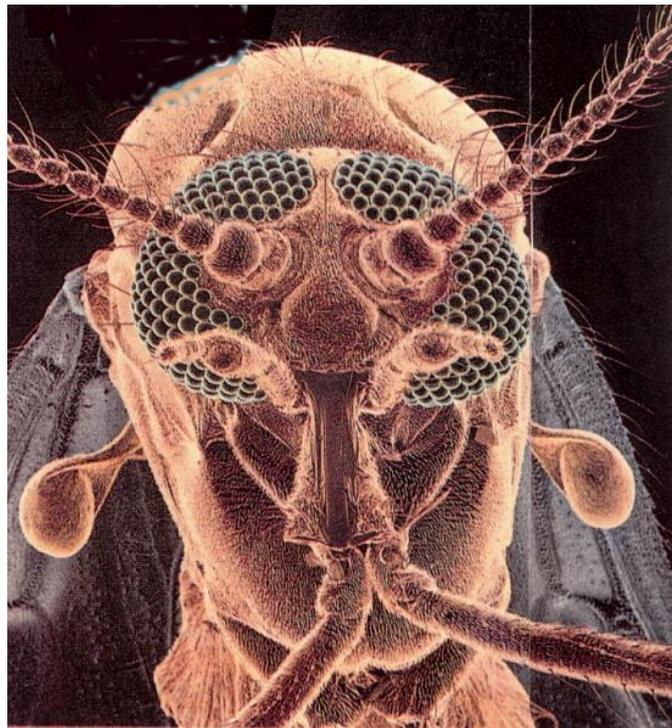


***III. 4- 50: Krubi plant in the NY Botanic gardens flowering after 5 years – compare flower head parts to insect head parts (right), seen as following parallel, but branching, evolutions***

Grohmann wrote, 'We have to imagine that there once lived creatures who combined the attributes of plants and animals – indeed, plants today still have some things about them which seem to point to a common origin with the animals', and that we have to accept that 'flowers and insects once formed one of these "in-between" kingdoms that only after a certain time diverged from each other'. There is still a great deal of mirrored, parallel development, and certain insects evolve like flowers, in similar stages (*III. 4- 7* and *III. 4- 50*).

The Fibonacci ratios are the well-known progressions also associated with the incidence of fruit-fly and pea plant mutations in the famous heredity experiments conducted by Mendel. Insects and plants live symbiotically because in the chain of life they need each other, so it is not surprising that their numberings echo each other, given their shapes are often made to fit into each other as hand to glove. It follows that we should in the same way automatically count insect legs, antennae, abdomen segments, wings, eye construction, and so on, noting the variations in proportion (as we did with leaves - *III. 4- 28*) that make each arthropod, bug or spider look the way it does for what it needs to do – indeed they also often echo animal or human characteristics in general layout. Their proportions are what make the insects look like

insects – they may use a different combination of layout of parts and be supplied with a simpler level of inner organ machinery from those of mammals - yet sometimes, as in the case of the face of the female midge (below), there are uncanny echoes of higher animal forms to come, bearing out Grohmann's idea (considered in more detail in *Book 6*). Certainly the interchange and overlap between insect and plant is so finely meshed that one cannot but stand aside and leave them alone in mutual interplay.



**III. 4- 51: Head of the female midge, curiously similar of a female human face**

Edward O Wilson presents some startling facts for mankind to face up to about the high proportion of plants and insects in the biological world in relation to all living entities taken together. Of all living organisms, from bacteria through plants and insects to animals, making up a total of 1,413,000 species, insects manifest in at least 751,000 species, plants in 248,400 and animals in 281,000, with the rest taken up by protozoa, algae, fungi, bacteria and viruses, all of which play a vital part in specific food chains. Of plant diversity, the majority consists of flowering plants compared to small numbers of gymnosperms, ferns, bryophytes and other minority groups (see *Appendix A*). If plants are taken out of the equation and the number of insect species measured against those of animal species, over *three quarters* of living entities consist of insects of all kinds, the final quarter mostly consisting of classes of primitive animals such as molluscs and worms, with mammals at the top of the food chain pyramid taking up only 1/260<sup>th</sup> of the total number of species.

Thus it is imperative not to forget just how crucial the flowering plants (angiosperms) and insects are in their teeming millions in upholding the existence of humans at the apex of creation. Angiosperms and insects *together* are co-rulers of the middle world between minerals

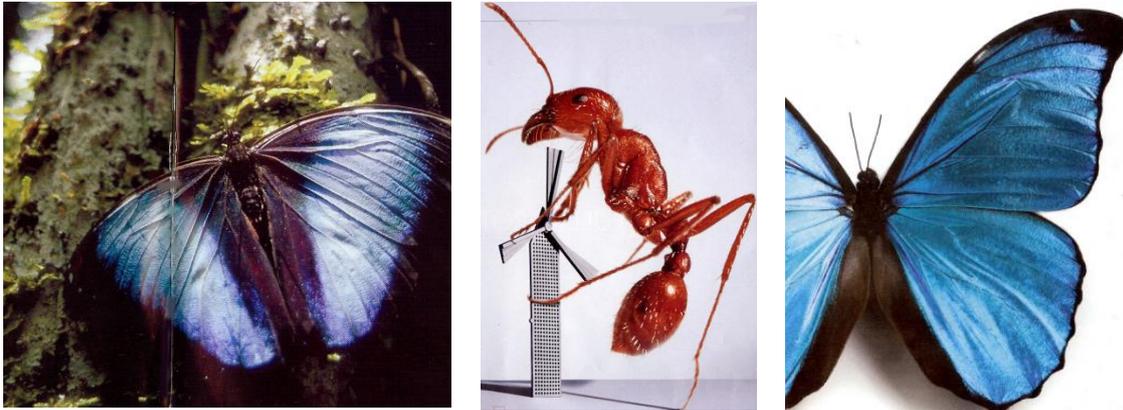
and animals, depending on each other not only for pollination/nutrition, but also for the processing of decomposing plant matter into rotting compost undertaken by the insects who feed on it –maintaining the fertility cycle for more plants to grow. The recent scare during the years 2005-2015 of the alarming disappearance of bees in the British Isles which was affecting the pollination of food crops of all kinds is a graphic example – it took that amount of time for the British Government to take notice and ban farmers from using nicotine-based neoleonid pesticides that were killing bees on a huge scale. Wilson goes on to say, 'So important are insects and other land-dwelling arthropods that if all were to disappear, humanity probably could not last more than a few months. Most of the amphibians, reptiles, birds and mammals would crash to extinction in about the same time. Next would go the bulk of the flowering plants and with them the physical structure of most forests and other terrestrial habitats of the world. The land surface would literally rot. As dead vegetation piled up and dried out, closing the channels of the nutrient cycles, other complex forms of vegetation would die off... and ... the land would return to approximately its condition in early Palaeozoic times'.



**III. 4- 52: Wasps on an orchid**

On another level the world of small organisms, when compared at the next level to clearly visible and recognisable plants, can both be seen as parallel to the subatomic world - if we take a quick overview in another realm for which Wilson gives the detail. The Challenger expeditions which dredged the deep ocean floor revealed a community of organisms dwelling there which contribute in the end to the existence of any one whale swimming in the ocean. Named the 'abyssal benthos', this level of the ocean contains hundreds of thousands of species of worms, crustaceans, molluscs and other invertebrates subsisting at low metabolic rates alongside a multiplicity of micro-organisms including thousands of bacteria. This is the ocean equivalent of the teeming insect life on a typical forest floor, underneath which is a further layer of decaying plant matter interspersed with even more tiny creatures including bacteria and fungi which live in it and transform it for the good of the plants and trees above. In shallow seas float microbial

mats consisting of diatoms, algae, bacteria and other tiny organisms which are interdependent, an interval of oceanic life which, with plankton, provides the basic food for fish. In the same way even basic unhygienic man can support head lice, body lice, crab lice, human fleas, human bot flies and a multitude of roundworms, tapeworms, flukes, protozoa, fungi and bacteria, let alone the viruses, all adapted for life on the human body. Every animal acts as customised host



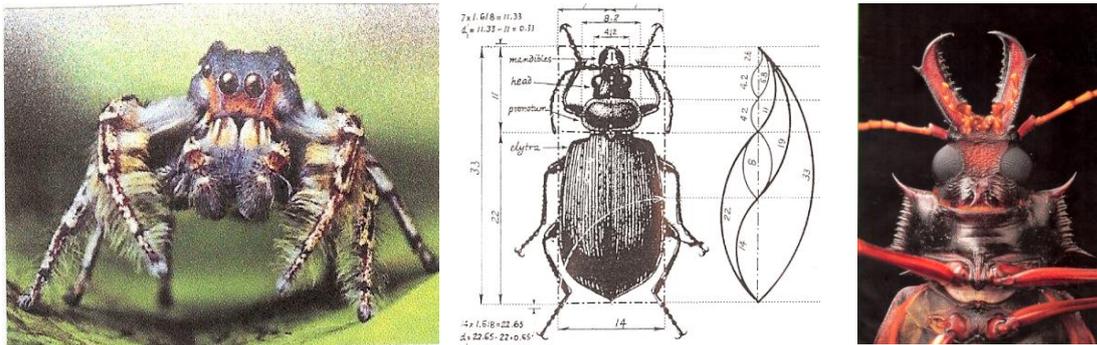
**Ill. 4- 53: Ant and butterfly are two insect families dependent upon, and contributing to, the intricate networks of biological interlacing of forest or savannah**

to parasites of varying harmfulness, and so too do plants, one individual leaf often acting as home to 'an entire miniaturised flora and fauna', says Wilson. Over and over again we are shown examples of octaves within octaves as if in self-reducing sets of mirrors going on into infinity. Given so many teeming organic beings, large and small, live in, on and through one large tree in the Amazon forest, it has been calculated how felling just one affects literally *thousands* of life-forms dependent upon it. (This idea alone made me give up trying to get my neighbour to cut down a monster tree in her garden that is cutting out the light in mine, and causing damage to our houses' foundations!)

Wilson attempted to quantify the ultimate full diversity of life according to the numbers of all possible gene combinations now known to be possible, and ended up with the number  $10^{17}$ , which still does not take into account the differences among individuals belonging to the same species. Each plant, insect and animal, let alone bacteria and fungi, is exactly and carefully structured for the task it has to perform: there is no species in the world, however small or lowly, that does not play a part in the maintenance, or consumption, of the biosphere. This is why the destruction by men of whole ecosystems, entire species of plants or animals, leads to the disastrous depletion of Gaia's entire harmonic system. Wilson (famous for his specialist knowledge of ant behaviour) provided in stunning detail the case for biodiversity in *The Diversity of Life* (2001) from which comes the following passage from the first chapter of the book, where he contemplates at night all that is going on in the Brazilian rain forest – for us non-specialists giving some idea of the specificity to the clusters of musical notes involved:

*All around the second-growth vegetation the fallen trees and branches rot and crumble, offering hiding places and good to a vast array of basidiomycete fungi, slime moulds, onerine ants, scolytid beetles, bark lice, earwigs, embiopteran webspinners, zorapterans, entomobryomorph springtails, japygid diplurans, schizomid arachnids, pseudoscorpions, real scorpions and other forms that live mostly or exclusively in this habitat. They add thousands of species to the diversity of the primary forest.*

*Climb into the tangle of fallen vegetation, tear away pieces of rotting bark, roll over logs, and you will see these creatures teeming everywhere. As the pioneer vegetation*



***Ill. 4- 54: Edward O Wilson hails the role of insects as partners with plants in the maintenance of biodiversity: the life cycles of many are hand in glove with each other***

*grows denser, the deepening shade and higher humidity again favour old-forest species, and their saplings sprout and grow. Within a hundred years the gap specialists will be phased out by competition for light, and the tall storied forest will close completely over... . it is diversity by which life builds and saturates the rain forest. And diversity has carried life beyond, to the harshest environments on earth.*

He goes on to describe other settings where a similar chain of tiny creatures all contribute to the rare mammal at the end of the food chain.

As we all now know, for the future of organic life on earth, including ourselves, this bigger view of the interdependent harmonics of nature as a whole is as important as noticing them at work in any one plant or insect, and Wilson is the prophet of this apocalyptic vision. Combined with knowledge of the streams of planetary and zodiacal Elements at work within them as given by Hauschka, we are overcome by how tremendous the reality of the myriadic orchestra we live in is, in what Darwin termed 'unity of type' adapting and evolving according to 'conditions of existence'. How do we, as an individual, join in?

***APPLYING THE KNOWLEDGE***

You might well believe that in saving the whale, the dolphins or the ozone layer – but have you thought closer to home about how you run your own garden, big or small? We may cringe from hurting animals but the majority still feel no compunction about eliminating insects, or the spider in the bath. Before tearing down the spider's web in your rose bush, consider how it

traps the little mites that do damage to your plants. Before you kill the sawfly wasps, think of their role, too, in eating other annoying insects, playing their part in a long chain of interdependence. Along with the ladybird, it gobbles up the aphids, milked by ants for the sap sucked from plants - so they don't spoil your roses after all. How kind or cruel are you to your plants in watering, feeding - and engaging with them individually through via the morphic resonance of your thoughts and emotions? I take it as read that the reader would favour organic gardening, knowing that slug pellets poison birds and chemical sprays even household pets. What is of detailed interest in Edward O Wilson's fashionable phrase is to start to encourage diversity in any environment we have a part in, to allow odd weeds here and there, and a corner for nettles to encourage the butterflies, generally allowing the moderate teeming of insects once we realise their important part within the chamber music of any small garden. In Britain the latest development is to emphasise the important part played by the chains of back gardens that make up the urban landscape in upholding habitat and variety across the entire country, bringing the field into the town.

An absorbing pastime is to sit on a park bench or walk out of your kitchen door into a kept or unkempt garden, and start to really look at how many forms of life you can see weaving in and out of each other, sometimes in mutual contact or conflict, sometimes on different tracks leaving each other in peace. When I started to look properly I was amazed to see how many different kinds of spiders were lurking under the leaves of my handkerchief-size garden, and



***Ill. 4- 55: Spiders may have as many as four pairs of eyes distributed round its head, as seen in this front view of a tarentula's face, above gripping pincers and first pair of legs***

that bumble bees were droning around every day from dawn, dipping into the fuchsia heads. The insects brought in the birds – and the birds the cats which to some extent as a human I could chase away when birds were on the ground, feeding, but otherwise I had to leave the law of the jungle to operate on its own terms, on one occasions losing my favourite blackbird to their jaws. Just keeping a plain garden is a good start, even if you do not feel willing to try to tune in to the plant spirits and fauns as happened at Findhorn (see below) – or get involved in the astronomical influences - which will happen in blanket terms anyway.

You might have noticed how different groups of birds come down at different times to feed in your garden. One of the most startling examples of how precisely different creatures can follow a kind of apartheid in order not to get in each other's way is given, again, by Wilson. Amongst the large number of variant species of the North American giant female silkworm moth, their daily sexual secretions are timed to fit into specific time slots of just a few hours each, during which males will be attracted and mating can take place. Thus females of the Promethean moth call from about 1600-1800hrs; females of the Polyphemus moth between 2200-0400hrs and females of the Cecropis moth between about 0300-0400hrs - and so on through 69 species of North American Aturnidae, each of which has its own *heure d'amour*. In the case of New England jumping spiders, each type will only mate with those that have the right specific patterns of colouring on the courting male's little spider face. What a model for human society to follow – especially in a time when people of different cultures live cheek by jowl, learning to phase their activities between each other in this way.

Wilson points out that in the world of biology smell plays as big a part as the audiovisual does for humans. '99% of animals find their way by chemical trails laid over the surface, puffs of odour released into the air or water, and scents diffused out of little hidden glands and into the air downwind. Animals are masters of this chemical channel where we are idiots'. Hence most operate best in the darkness, as daylight is not essential. The most common of these are flowers and insects, notably the socially organised ones such as bees – and ants on which Wilson is the supreme expert. He states that there are 20,000 species of ants ranging between the Arctic Circle and the tip of South America. If they are weighed against the body mass of all animals in that area, ants would take up 10% of that overall biomass. They in turn constitute between 60 and 70% of all insects – hence Wilson's particular fascination for them. He believes bees and ants are prolific because they are socially organised into such large groups that each individual is protected and acts according to what Sheldrake would call the morphic field of the group with the Queen at its centre holding everything together.

All societies have major and minor morphic fields, human society being no exception, and that of insects linked to the central queen ant or bee is an interesting example. Insects play interactive roles too, such as the vicious ants in the Brazilian rainforest noted by Wilson as inhabiting the hollow internodes of the Cecropia tree trunk, protecting the tree from predators but allowing sloths and a few other herbivores that only feed on its leaves. Hence their haven is protected by thousands of ant pincers. But this is not the place to go into the sophisticated behaviour of ants and bees, or of individual insects such as beetles or even mites: we simply need to get a sense that in nature there are loose and tight harmonic sub-series at work.

Through a welter of specific detail Wilson demonstrates beyond doubt that 'eliminate one species, and another increases in number to take its place. Eliminate a great many species, and

the local ecosystem starts to decay visibly'. In countless ways Wilson illustrates his point, not only with plant and insect examples, but also what happens if one *animal* is withdrawn from the food web. As Wilson points out, this assembly of life took a billion years to evolve, and has over millennia been subject to at least five extinction crises, including the catastrophe that brought about the annihilation of the dinosaurs - the result of which was the rise of the mammals in an alternative major scale of creatures, more subtly designed than the one that had held sway for millennia before. Then, says Wilson, in the present day along comes humanity to initiate 'the sixth great extinction spasm; from the top of the pyramid of responsibility, 'rushing to eternity a large fraction of our fellow species *in a single generation*'. Wilson's mission in his seminal book is to show from instances of Man's devastation of his own planet that 'every scrap of biological diversity is priceless, to be learned and cherished, and never to be surrendered without a struggle'. Wherever we happen to be, our fight for diversity begins right where we are, be it the plant pots, birds and insects on our own windowsill.

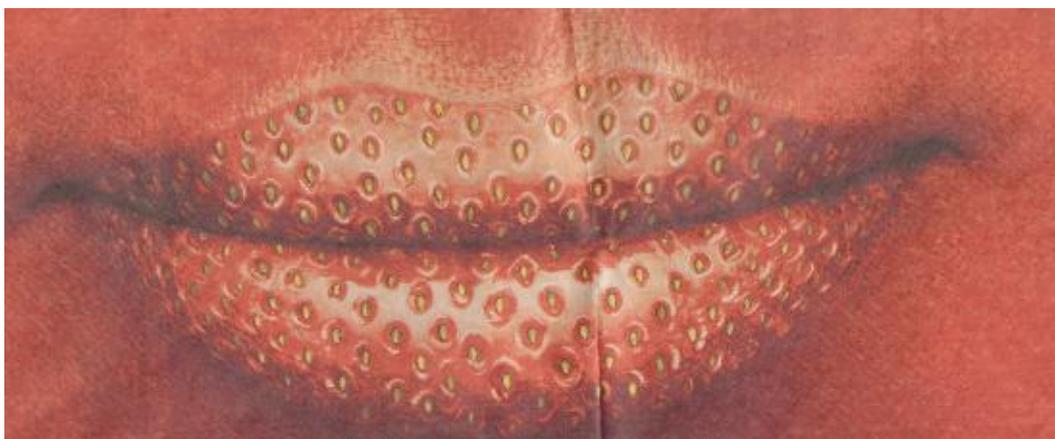
The idea of biodiversity also points to the parallel moral - that people who are fungal, insect-like, socially organised into exclusive groups, or with shapes deviant from the norm, all have their part to play in the human world organism, and that society cannot afford, along the lines of Aldous Huxley's *Brave New World*, to deliberately cultivate standard human types at the expense of natural variation. Nor does it solve any problems to deliberately eliminate an entire race or class, as recent history has shown. The model of the moths weaving in and out of each others' time zones shows that society's different types, too, can weave round each other's paths without standing in each others' way. It is surely also valid for groups to maintain their own identity if they so wish, and not to have the specificity of a particular tradition adulterated. Human groups invading each other and other human groups attempting to separate themselves out from a polyglot society are both cause of the wars that threaten our entire planet now. If different group values instead cancel each other out, such destruction can in the long run only be the prelude to spiritual chaos.

### **SEX, FRUITS AND SEEDS**

Fruit and seed go together, and this culmination of the Plant Octave must be rigidly organised at its core, since it provides the blueprint for the next generation of the plant. We shall not examine seed structures but the analogy with the inner arrangements of atoms, or molecules at their DNA level as their individual signature can be taken as a general principle at work. Baron von Herzelee found that in experiments with seeds germinated in distilled water, there was an increase in their Potash, Magnesium, Phosphorus, Calcium and Sulphur content, proving they were making these Elements themselves, and in further systematic experiments he showed how in fact young seedlings were making Sulphur out of Phosphorus or Calcium out of Magnesium salts, pinning down successive stages of Carbon Dioxides to Magnesium; Magnesium to

Calcium; Calcium to Phosphorus and Phosphorus to Sulphur – looking at their numbers in the Periodic Table show how this would be possible at the sub-atomic level. Separately, he also showed they could transform Nitrogen into Potassium.

In contrast to herbs, which we associate mostly with leaves, when we think of spices they are, on the whole, seeds - though on looking at a comprehensive list there are notable exceptions - such as cloves which are dried flower buds, or saffron which is crocus stamens literally worth their weight in gold. The idea of seeds means we consider fruits (expansion) and the seeds they bear (contraction) as their babies – which means we must look at plant sex taking place at the flower stage, without which fruit and seeds would not happen.



**III. 4- 56: Strawberry lips (fruit and seed)**

It was Darwin who first considered the sex-life of flowers, pointing to myriad examples of how flower shapes were contrived as the exact negative mould for the right entrant insect that, enticed by its inner nectar, would also be so shaped as to brush against the pollen on the stamens and against the sticky pistils of the next flower to offload it. Because there is such a wide diversity of angiosperms there has to be a corresponding diversity of insects to service their varying forms. Rather than catalogue the examples, it is more fruitful for us to understand the general principle and consider, the next time we see an insect creeping into a flower like a foxglove, or hovering above another, its ulterior function and how its shapes suit the insect's *modus operandi*.

Plants are further evolved than crystals on several counts, one being that they are the first in the scale of living organisms to have differentiated sexual characteristics of male and female, needing each other for self-perpetuation. In angiosperms polarity results in offspring by the transmission of substances through the sexual organs (*III. 4- 14*) and, interestingly, most plants – other than certain trees which have distinct male and female forms – are hermaphroditic in that they bear both penis/stamen and vagina/pistil in the same body and thus capable of self-fertilisation, though in many cases pollen from another of the same kind of plant is required instead (or in some cases separate male and female plants are needed).



***Ill. 4- 57: Date palm germinated by Israeli archaeologists from a 2,000-year-old seed found at the Roman site of Masada: to bear fruit it will need a tree of the opposite sex nearby***

The ancient Babylonians knew that palm trees were male and female, and that the pollen from one sometimes had to be manually applied to the sticky flower of the other to ensure the date crop, rather than leave it to the chances of the weather. For the most part plant propagation was left to the natural agencies of wind, bird and insect until human intervention became large-scale in modern times. Interference with their inner numbers, although accepted as allowable, becomes seriously unacceptable when tinkering with subatomic particles in plant DNA. Natural harmonic rhythms are the birthright of any plant, not only in terms of its individual unfolding, but also of its cellular interaction with light, water, nutrients and insects. These take place as the result of thousands of years of evolution which we did not ourselves invent, and we do best to leave nature alone as it naturally operates - one of Monbiot's key concerns.

Kayser in *Akroasis* gives an interesting insight into the octaval structure of plant reproduction in that he tuned into the male and female principles throughout as major and minor scales. 'Nature', he writes, 'created genus and sexuality for the first time in and on the plant. In every chord the third - the third step in the diatonic scale, which is the fifth ratio - is the "sex tone". It is male or female depending on whether it occurs as a major third in a major chord, or a minor third in a minor one: the major and minor scales rest upon this difference. Thus the third is realised through the fifth vibration or string-length of a given unity, which is why five in the plant kingdom is not only significant because a great number of blossoms show a five-petal arrangement, but it is also important as a morphological manifestation in contrast to the 3 and 4 that rule the world of minerals: *the fifth appears for the first time in plants.*' As a

morphological constant, not only in the number of blossoms, but also in the main series of laws of the spacing of leaves the number 5 reveals itself - which he understands as the reason why sex manifests for the first time in plants.

In the spiral of fifths (*Ill. 4- 24*, explored in depth in *Book 13* on the Pythagorean Comma) the principle of growth from one cycle to another, one dimension to another (leaf to flower to fruit to seed) is played out. Kayser continues, 'One who is musical enough to distinguish not only between major and minor thirds but who can recognise, in the sounds of the two, that character of longing which lies in the innermost nature of this interval – the singing in thirds in folk music, for example, or the third as the mediant [or supplicant] – finds a deeper meaning to what is meant by sexuality'. The 'latent longing' at the heart of inorganic matter and its atoms is expressed for the first time as sensitivity and subtlety of shape in plants, and any propagation through pollination points to the resolution of a polarity of which sex is a reflection. Sex is therefore a thrust towards higher development and self-perpetuation, and the 'longing' is the impulse to reunite with the divine prototype, to rediscover and retain the lost harmony dissipated by the descent into matter. That desire to return to source is the real motivation in all development and progress. From a position of intolerable dissonance, forms of life are compelled to seek self-reduction back to significant union and order. From that impulse reactions are set in motion that must continue until they end in resolution, the attainment of spiritual and physical connectedness. I believe this motive underlies human sexual attraction far more fundamentally than the need to reproduce offspring.



***III. 4- 58: Praying mantis on an Amazon forest flower***

The provision of a sexual physiology makes this process of transformation possible, and lies at the heart of the urge to perpetuate the species (ask any articulate human being which priority they give to these two motives). Apart from the agency of wind or deliberate human

intervention, the plant world's 'exchange of bodily substances is facilitated by the vast and amazing insect world which in a myriad of ways is created to fit snugly into the interstices of nature's flowers while dragging stamen pollen across the next set of receptive pistils – or wriggling through the humus to transform plant matter into soil.

### **OPENING OUT TO NATURE, AND A NEW KIND OF GARDENING**

I have to admit that when I started writing this particular booklet I took out of the drawer my assembled information gathered over many years. As I began it in Spring and ended it in early Summer, it was a period when I took many long breaks in my small garden, which I started off tending in the usual manner, treating it as an object and the plants as objects, to be tidied up, fed and watered in order to be a good setting to receive guests or sit in in the early morning and eat my breakfast. Then when I was half way through writing I sat down one morning on the garden bench with my coffee and thought, 'My goodness, I'm writing all this information, but I'm not practising what I preach, as I am not connecting with the plants through my inner being'. I sat trying to say hello, and got nowhere. I then simply sat and sent out a telepathic message to the assembly of plants, saying, 'I'm so sorry to have been so mechanical with you – please teach me how to tune in to you all properly!' The next day coming out into the garden, I mentally made the effort to tune in and this time felt I could hear a choir of extremely high notes greeting me. I still have to make that positive effort from my previous attitude, but there has been a major change in the way I work in the garden and relate to the plants since. In other words, I realised I had to work on applying my own book to myself with – to me – wonderful and unexpected results, and I will never garden in the same way again.

Man's relationship with nature has radically changed during their two-million year-old history. We can only imagine from the few clues of archaeological remains how close the early homonids were to plants for the thousands of years they spent as hunter-gatherers, finding out by trial and error what plant was good for what – and recent archaeological techniques have now under the microscope given a taste of the huge variety of wild plants they consumed. Then the first farmers in Neolithic times adapted their knowledge to the task of developing vigorous strains of grasses that were to become our wheat, barley and oats – the first step in a tradition of breeding and hybridization that has been the excuse recently for genetic engineering and possible damage to the integrity of plant-life by cutting out interaction with insects. At this transitional stage we can imagine that, as with the primitive tribes in Borneo or Australia today, their knowledge of the uses of plants was comprehensive and detailed, borne of centuries of first-hand experience – yet farming was the first step away from life in the wilderness. Monbiot points out that this is to do with population figures, and that the huge world population today would make it impossible to return to the wilderness *en masse*, but that we should vehemently protect those peoples already living naturally in the wilderness from being walked over by

'modern civilisation'. However, any individual who feels the call of the wild should be able to follow their instinct: interestingly the canonical Hindu Four Stages of Life, starting with Childhood, being a Student and then becoming a worldly Householder, in the final stage has the individual returning to the forest to live again in Virgin Nature and meditate on the Last Things. This process need not be exclusive to Hinduism, and many young New Age hippies tried it.

Only since written history began, with mankind gaining fuller 'control' over nature, did people start to think of plant life pictorially in terms of beautiful scenery, taking yet further the process of disconnection from nature which may have left behind it many great painted masterpieces of the sublime picturesque but also made it harder for most people to tune in and listen to that



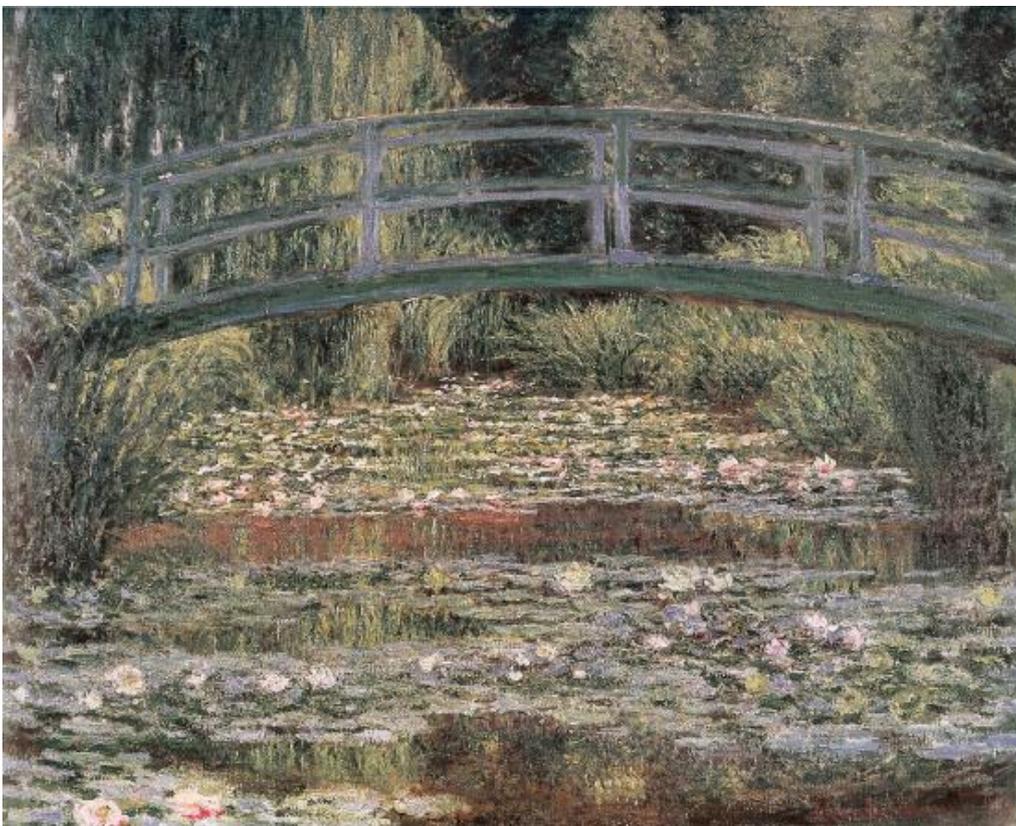
**III. 4- 59: Claude Lorrain LANDSCAPE WITH THE NYMPH EGERIA MOURNING OVER NUMA, Naples National Gallery**

inner music of nature insisted upon by the Romantic poets – but we have to learn to move between completely objective views of nature and our subjective participation in it, to realise that all angles are valid - as also that no one view is the sole approach.

Through the ages Nature (in contrast to architecture) has often provided the general background in countless works of art, with the use of plants not only scenically but also symbolically (Olive for Peace or the Vine for Bacchus/Christ). In the work of Claude (above) we note a stage when mankind wished to express the nobility of nature as the backdrop for the deeds of ancient history, and the great country houses of Europe in the 18C deliberately re-

landscaped their surrounding estates to look like a Claude painting. Into the Regency or Empire period of the first decades of the 19C society all over Europe was beginning to experience the split between urbanism and the lost world of nature whose embrace they missed so much, despite seeming control of it as the Industrial Revolution picked up pace. Beethoven's Pastoral Symphony written at this time expresses pleasure at returning to the wilderness of nature, hearing the running of the brook and surrounded with the cadences of birdsong. This yearning for direct contact with the plant world and everything connected with it has been expressed in different movements that attempted to recontact nature ever since – whether in the poetry of Romantics such as Wordsworth and Keats, the 'biophilia' of E O Wilson or most recently the notion of 'rewilding' of our daily lives as put forward by George Monbiot.

The dilemma is that, although many of us dream of going back to the forest, without the support of the technologies of modern life that spare us the daily physical grind, few of us would in reality enjoy the comparative toughness of the hunter-gatherer life. For most, episodes of wildness to contrast with our participation in the electronic world are sufficient – to be able to walk out of the back door into a small garden as a sanctuary of teeming bird, plant and insect life, spend an afternoon in the park, or make camping visits to remote places for a fortnight a year. Only a world disaster would truly force us to take up the life of survival in primal nature, and the many recent Self-Sufficiency movements in the West seem to be rehearsals arming us for that apocalyptic eventuality.



**III. 4- 60: Claude Monet: THE JAPANESE BRIDGE, Philadelphia Museum**

Impressionist painting encouraged the stream of consciousness approach to nature akin to the writing of Virginia Woolf in *To the Lighthouse*. Mechanised Western man had moved so far out on a limb that the longing for nature erupted once more, while avoiding the brutish conditions of the average peasant, still close to the land and at no more than one level up from the grains and animals he lived with instinctually. The countless paintings Monet did of his garden hour by hour convey how the human observer can become one with every throbbing atom of atmosphere and vegetation, as changing complementarities of colour between sunlit surfaces and shadow endlessly fluctuate. His and his fellow painters' attempts to deliberately avoid artificial composition, painting any block of raw nature that happened to come to view, provide an authentic record of Man's self-inclusion in nature, as human receiver-transmitter (a concept described in *Book 0*).

## CONCLUSIONS

I have tried to bring together in this book key ideas from work done by many researchers who have tried to put their finger on what it is that keeps Nature in harmony, the foundation of which is an understanding of the very simple music that lies behind it. Many writers have analysed the hierarchies of nature objectively within mainstream science – or have written about their love of nature from a more subjective, even sentimental viewpoint – but without a mention of the architecture of its musical scales. Take, for instance, Buhner's books<sup>26</sup> which attract a great deal of admiration today, in which there are no explanatory pictures or diagrams – and too much intellectual moralising, without practical examples. I have tried to lay down a path of references for the reader to follow up, given that from most of them for reasons of space I have only skimmed the surface of their detailed messages and insights – the exceptions being Thompson, Kayser, E O Wilson and, indeed, Hauschka – all of them classics worth buying.

I hope in this book we have provided the reader with the key tool of the Octave principle at work in many different ranges – which is what makes it possible for an individual to know everything about the essentials of Nature in its myriads of manifestation in the physical world! It is one thing to look at the veil of appearances that the Hindus call Māyā – quite another to take what I hope in this book has been a Journey to the Underworld - the journey into the invisible engine house where the throbbing systole and diastole of the atomic Underworld underpins the extraordinary role plants play in mediating between sky (which means stars, planets, Signs and levels of atmosphere) – and Earth (which means the orchestration of the Elements). We start to see that– whether in terms of the hidden half of the plant within the Earth, or in terms of seeing into the hidden processes of growth and plant design, this music is responsible for the synthesis and continual transformation of the Unseen to the Seen – and of

---

<sup>26</sup> Stephen Harrod Buhner *Secret Teachings of Plants* 2004 and *Plant Intelligence and the Imaginal Realm* 2014

the Seen back to the Unseen. One does not have to be a scientist to experience this, though the view science provides of the subatomic world certainly provide further levels of verification.

Deep in the brain of modern urban man there still resides the hunter-gatherer instinct. A large proportion of society still gains the greatest pleasure from camping, hunting, fishing, bird-watching, gardening or visiting national parks. According to E O Wilson, more people visit zoos and aquaria in the USA and Canada than attend sports events and 'they travel long distances to stroll along the seashore for reasons they cannot put into words'. These are examples of what he calls *biophilia*, the seeking out of the natural wilderness untouched by Man, in order to feel reconnected once more –to an extent this can be achieved simply by growing a few plants in a window box or tending one small palm in a large pot on a basement patio. I see in the huge incidence of tattooing and body-piercing going on in the urban jungle the eruption amongst urban groups spending their life in boring factory jobs of an *à rebours* 'wild' or 'tribal' code of behaviour - often the marks of primitive high-rise flat gang groupings or football fans!

Wilson goes on to define true wildness: 'Wilderness is a metaphor for unlimited opportunity, rising from the tribal memory of a time when humanity moved across the world valley to valley, island to island, godstruck, firm in the belief that virgin land went on forever past the horizon'. It goes much further than that – the more we know about the inner music of plants the more we realise how deep is the urge to bathe in its natural symphonies and restore our ragged auras which, a psychic once told me, are literally torn to shreds by the harsh dissonances of commercial sound. Interestingly, in the ancient world as Greek history began, tracts of wilderness were kept aside as sanctuaries, like our modern-day game parks, seen as presided over by gods of the wilderness such as Pan or Artemis. Many of the first sanctuaries were in fact nature reserves with a single altar in the centre. Later as architecture was inserted into the sacred precinct, the idea of the wilderness receded, yet it still often formed part of the temenos within which animals were not to be hunted, and entry into which entailed instant death for the intruder. For wildness is purity, since it is untouched, and the entrant brings in the contaminating ethos of the profane world outside that presumes mastery over nature.

Today although we may have temporarily lost that sense of the sacred, we are in the process of renegotiating our relationship with plants since our awareness of their inner realities and structures has expanded beyond all recognition, probably back to what the hunter-gatherer experienced intuitively anyway. Since the Industrial Revolution the consequences of mankind's rapacious attitude towards nature are truly coming home to roost, and regaining access to the higher dimensions of plants is part of the re-evaluation that has begun. It seemed a revelation when Lovelock reminded us that the entire Planet Earth is a living organism surrounded by its throbbing envelopes of atmosphere, ionosphere and magnetic field, all pulled into a 'tail' behind the Earth as it follows its trajectory round the Sun (*Book 0, III. 0-38*).

I hope with the knowledge from this book we can take gardening, camping holidays and the climate change slogans a great deal further. It is the entire fan of vibration, branching out in Golden Sections, that lies behind Sheldrake's concept of *morphic resonance*, which we should try to consciously cultivate and walk into. It is easy to see how it applies to plants, structurally and in terms of their more wide-ranging electro-magnetic – and other – fields. But it also applies to the way ideas spread amongst humans, or new activities amongst animals, because each kind of creature is united by an overall general field which in the ancient world were understood as nature spirits and nature gods and goddesses. The world of nature as a whole, our Mother Nature, is a massive morphic field, in Lovelocks' terms the entirely interlinked living organism called Gaia– and plants are largely responsible for generating and maintaining the balance (homoeostasis). How we correlate resonance fields to the 'scientifically acceptable' ones is up to you individually to work on. I end with one story of such 'tuning in' that led to a startling encounter.

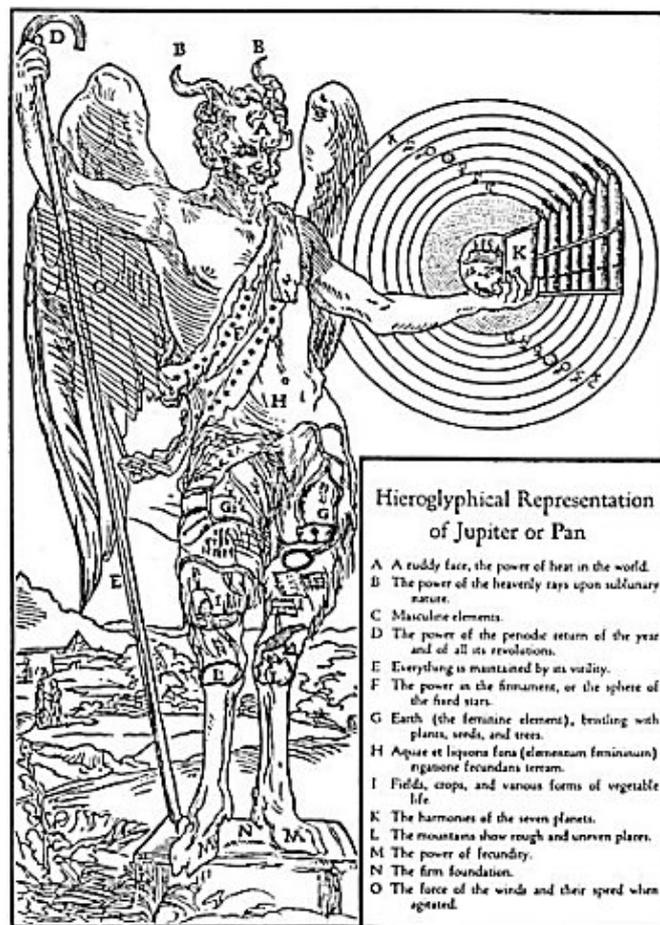
### ***A MEETING WITH THE GREAT GOD PAN***

In the amazing story of the Findhorn Community<sup>27</sup> in Scotland during the 1970s and 1980s the governing spirits of the plant world – sprites, nymphs, dryads and other such devas made themselves known through the encouragement of the founder members, helping to foster astounding harvests and flowers in an unpromising stretch of seemingly barren land, proving that vaster morphic coordinators – perhaps anchored in the Elements as Hauschka describes - oversee the wellbeing of the plant world than the modern world would credit, and that humans should respect and re-contact them if that realm is not to languish inconsolably under increasing abuse.

Such a turn of events was already becoming clear during the last days of the Roman Empire. It was Julian the Apostate who described how the final death of the God Pan was announced to the Egyptian captain of a ship sailing from Greece to Italy in Roman times. As they passed Tunis, a voice called him by name which at first he did not answer. 'The voice was heard a second time, calling Thamous, in a frightful tone; with none making answer, but trembling and remaining silent, the voice was heard a third time, more dreadful than before. This caused Thamous to answer, 'Here am I, what dost thou call me for? What wilt thou have me do?' Then the voice, louder than before, bid him publish, when he should come to Paloda, that the Great God Pan was dead'. When Thamous later announced the dreadful news, 'deep groans, great lamentations, and doleful shrieks, not of one person, but of many together, were heard from the land'. Pan died because with the rise of Christianity and the loss of all the Gods and Goddesses of the Pantheon, Pan - God-man with goat legs and horned head who ruled over

---

<sup>27</sup> George Trevelyan and The Findhorn Community *The Findhorn Garden: Pioneering a New Vision of Humanity and Nature in Cooperation* 1989 (revised version of the Findhorn Community's first book on the garden, 1976). More of Trevelyan in *Book 6*.



**III. 4- 61: Pan holding his Pan pipes through which he plays the musical notes of the entire world of nature that comes under his sway**

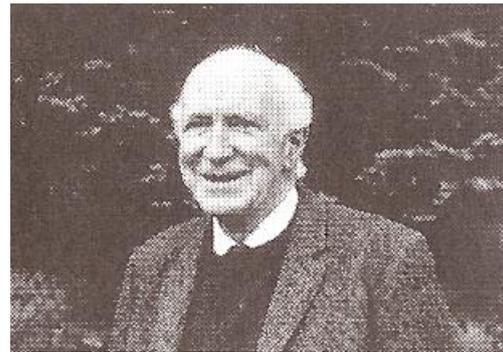
naturally instinctual Nature - was now cast by the Christian Church in the role of the Devil! It is understandable that Julian, himself briefly Emperor, pined for the return of the Old Gods.

Only in recent times at Findhorn did Pan make an appearance in this form, with his cohorts, the devas and dryads - and also his fauns, one of which appeared as a prelude to Pan's own appearance to co-founder Ogilvie Crombie in the Edinburgh Botanic Gardens. I use the summary account given by Gordon Strachan in his *Artist as Prophet*:

It was a beautiful warm, sunny afternoon and Crombie was walking in the Botanic with a sense of heightened awareness and expectancy. Everything seemed more real and alive, and he felt very much at one with the trees, the flowers and the grass. Suddenly he saw something dancing round a tree – it was a faun. Needless to say he found this very hard to believe, but he resisted his desire to analyse it away, and just watched. Eventually the faun came right up to him and was very surprised when it discovered he could see it. They had something of a discussion about fauns and about humans, and the faun told Crombie that it was its job to help the trees to grow. It felt that it was very foolish of human beings not to believe in nature spirits'.

Later Crombie was blessed with a visitation from Pan himself<sup>28</sup>. This time he was walking across Edinburgh one evening in late April when, gradually, as he was walking down the Mound, he felt the atmosphere change. He had the same sense of heightened awareness as he had had in the Botanic Gardens. Suddenly he saw something beside him – it was a huge faun! This extraordinary creature radiated a tremendously powerful energy, but Crombie said he felt no evil in him. Then the creature asked him (telepathically of course) if he knew who he was. In a flash Crombie realised that it was none other than Pan himself. This extraordinary being then began to interrogate Crombie as to his feelings towards himself and his kingdom. Crombie said that he loved all the earth spirits, the woodland creatures, and probably great Pan himself – in fact, yes, he did love Pan himself. The weird interrogation continued, with Pan expressing his sadness at the way the Church had branded him as the embodiment of evil. It became clear to Crombie during their interchange that some sort of reconciliation between the nature kingdom and humanity was perhaps again possible, and that he was to play a part in it. Human beings needed the help of nature spirits to save the world from ecological disaster, but the spirits would only help if they were loved and respected.

The inclusion of Pan the planet providing the ring of gravity enclosing the entire solar system has only recently been understood as the true ruler of Taurus (explained on the Cosmokrator website [www.cosmokrator.com](http://www.cosmokrator.com), and the role of its energy is to hold everything together (*Pan* in ancient Greek means *Everything*, as we know from its use in compound words expressing the idea). The fact that Pan and his pipes is the Great Being that contains the entire orchestra of Nature is an awesome thought and in individual ways we can find avenues of approach to propitiate his power and help it live.



**III. 4- 62: (left) Pan in the groves peopled by hidden dryads, hamadryads and nymphs; (right) Ogilvie Crombie, described by Sir George Trevelyan as 'a Merlin figure' and a true Gandalf**

But as Crombie himself wrote, 'To anyone who may have expressed a wish to see and talk to nature spirits... remember it took 63 years for my wish to be granted, so don't lose hope'.

---

<sup>28</sup> R Ogilvie Crombie *Gentleman and the Faun: Encounters with Pan and the Elemental Kingdom* reprint 2009

**APPENDIX A: YOUNG'S FAVOURED CLASSIFICATION OF THE PLANT KINGDOM WITH THE NINE MAJOR DIVISIONS GIVEN TO HIGHER PLANTS BY BOLD**

**A comparative summary of some classifications of the plant kingdom\***

The arrows indicate the fate of taxa in successively more modern systems of classification. When the name of a group is used later at a higher rank, as, for example, in the change from Chlorophyceae to Chlorophyta, the name of the lower group usually is retained as a subsidiary under the higher. The figures in parentheses are estimates of numbers of species.†

Eichler, 1883 (and modifications)	Tippo, 1942	Bold, 1956	Common name	Approx. no. of species
<b>PLANT KINGDOM</b>	<b>PLANT KINGDOM</b>	<b>PLANT KINGDOM</b>		
<b>A. CRYPTOGRAMAE</b>	Abandoned	Abandoned		
<b>DIVISION 1. THALLOPHYTA</b>	<b>SUBKINGDOM THALLOPHYTA</b>			
Class 1. Algae	Abandoned			
Cyanophyceae	PHYLUM 1. <b>CYANOPHYTA</b>	DIVISION 1. <b>CYANOPHYTA</b>	} Algae	(19,000)
Chlorophyceae	PHYLUM 2. <b>CHLOROPHYTA</b>	DIVISION 2. <b>CHLOROPHYTA</b>		
	PHYLUM 3. <b>EUGLENOPHYTA</b>	DIVISION 3. <b>EUGLENOPHYTA</b>		
	PHYLUM 4. <b>FHAEOPHYTA</b>	DIVISION 4. <b>CHAROPHYTA</b>		
Phaeophyceae	PHYLUM 5. <b>RHODOPHYTA</b>	DIVISION 5. <b>PHAEOPHYTA</b>		
Rhodophyceae	PHYLUM 6. <b>CHRYSOPHYTA</b>	DIVISION 6. <b>RHODOPHYTA</b>		
Diatomeae	PHYLUM 7. <b>PYRROPHYTA</b>	DIVISION 7. <b>CHRYSOPHYTA</b>		
		DIVISION 8. <b>PYRROPHYTA</b>		
Class 2. Fungi	Abandoned			
Schizomycetes	PHYLUM 8. <b>SCHIZOMYCOPHYTA</b>	DIVISION 9. <b>SCHIZOMYCOTA</b>	} Fungi ( <i>Sensu lato</i> )	(42,000)
	PHYLUM 9. <b>MYXOMYCOPHYTA</b>	DIVISION 10. <b>MYXOMYCOTA</b>		
Eumycetes	PHYLUM 10. <b>EUMYCOPHYTA</b>	Abandoned		
	Class 1. Phycomycetes	DIVISION 11. <b>PHYCOMYCOTA</b>		
	Class 2. Ascomycetes	DIVISION 12. <b>ASCOMYCOTA</b>		
Lichens	Class 3. Basidiomycetes	DIVISION 13. <b>BASIDIOMYCOTA</b>		
<b>DIVISION 2. BRYOPHYTA</b>	PHYLUM 11. <b>BRYOPHYTA</b>	DIVISION 14. <b>HEPATOPHYTA</b>	Liverworts	(9,000)
Class 1. Hepaticae	Class 1. Hepaticae	DIVISION 15. <b>BRYOPHYTA</b>	Mosses	(14,000)
Class 2. Musci	Class 2. Musci			
<b>DIVISION 3. PTERIDOPHYTA</b>	Abandoned			
	PHYLUM 12. <b>TRACHEOPHYTA</b>	Abandoned		
Class 1. Lycopodinae	Subphylum 1. Psilopsida	DIVISION 16. <b>PSILOPHYTA</b>	Psilophytes	(4)
	Subphylum 2. Lycopsidea	DIVISION 17. <b>MICROPHYL LOPHYTA</b>	Club mosses	(1,000)
Class 2. Equisetinae	Subphylum 3. Sphenopsida	DIVISION 18. <b>ARTHROPHYTA</b>	Horsetails & sphenopsids	(25)
	Subphylum 4. Pteropsida	Abandoned		
Class 3. Filicinae	Class 1. Filicinae	DIVISION 19. <b>PTEROPHYTA</b>	Ferns	(9,500)
<b>B. PHANEROGAMAE</b>	Abandoned			
<b>DIVISION 4. SPERMATOPHYTA</b>	Abandoned			
Class 1. Gymnospermae	Class 2. Gymnospermae	Abandoned		
	Subclass 1. Cycadophytiae	DIVISION 20. <b>CYCADOPHYTA</b>	Cycads	(100)
	Subclass 2. Coniferophytiae	DIVISION 21. <b>GINKGOPHYTA</b>	Maidenhair tree (ginkgo)	(1)
		DIVISION 22. <b>CONIFEROPHYTA</b>	Conifers	(550)
		DIVISION 23. <b>GNETOPHYTA</b>	(No common, inclusive name)	(71)
Class 2. Angiospermae	Class 3. Angiospermae	DIVISION 24. <b>ANTHOPHYTA</b>	Flowering plants	(250,000)
		Approximate total		(350,000)

\* From Bold, H. *The Plant Kingdom*. Englewood Cliffs, N.J.: Prentice-Hall, 1964.

† Only groups with currently living plants are included.

**APPENDIX B: WORLD DISTRIBUTION OF NATIVE USE OF PSYCHOTROPIC PLANTS**



**APPENDIX C: THE CARBON-HYDROGEN-OXYGEN TRIAD IN PLANT-RELATED COMPOUNDS**

FIRST BASE IS THE CREATION OF STARCH/CARBOHYDRATE by plants (see *Ill. 4- 34*) from the combination of Carbon Dioxide and Water (see *Ill. 4- 33*), with Oxygen given off (a daytime process catalysed by the Sun):



Higher up the plant octave, STARCH is then metamorphosed into SUGARS, NECTARS AND PERFUMES using the same 3 elements - variations giving rise to colours e.g. beet and cane sugar ( $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ ) or honey, grape sugar and fructose ( $\text{C}_6\text{H}_{12}\text{O}_6$ )

Cellulose is a colloidal form of starch close to sugar in formula, used to make a number of different materials, including paper

\*\*\*\*\*

If larger numbers of Hydrogen or Carbon atoms are fused into longer chains or rings, a host of new compounds are formed (from Camphor to Benzene; oils\*, resins and acids; and the more inert coal-tar products from *fossilized* plant life) - all coming under the umbrella of Organic Chemistry.

\*Hauschka points out the increase of Hydrogen atoms in, say Olive Oil –  $\text{C}_3\text{H}_5(\text{O}.\text{C}_{18}\text{H}_{33})\text{O}_3$  or Rape Seed Oil –  $\text{C}_3\text{H}_5(\text{O}.\text{C}_{22}\text{H}_{41})\text{O}_3$  – and that Hydrogen is a component of all acid formulae

**THE TRIAD EXTENDED TO INCLUDE NITROGEN: THE ATMOSPHERIC CROSS ASSIGNED TO THE FOUR CARDINAL SIGNS BY HAUSCHKA, AS ALSO VITAMINS A, B, C & D**

As Hauschka puts it, 'Carbon, which combines only with Hydrogen, Oxygen and Nitrogen in addition to combining with itself, is a component of several *million* known components [compared to] the whole realm of the inorganic ... mineral world which accounts for only a few tens of thousands'.

\*\*\*\*\*

With the appearance of Nitrogen into the equation we have Hauschka's Atmospheric Cross (*Ill. 4- 36*), the addition of Nitrogen to the CHO triad accounting for the formation of PROTEIN:  $\text{C}_{720}\text{H}_{1134}\text{N}_{218}\text{O}_{148}$ , a much more complex molecule enabling the development of animal flesh when consumed

\*\*\*\*\*

If from the quaternity Oxygen and Hydrogen are absent, Carbon-Nitrogen compounds remain, constituents of the deadly poison, Cyanide ( $\text{C}_2\text{N}_2$ ), present in the berries and fruits of the Deadly Nightshade family

Nicotine ( $\text{C}_7\text{H}_{10}\text{N}_{1.5}$ ) from the tobacco plant still has Hydrogen present, but no Oxygen, and is cumulatively poisonous over long periods of usage

In Britain during WWI, with the addition of Nitrogen, Sugar was used to make nitroglycerin and other explosives