

Energetic Plant Growth

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This document is a compilation of parts of lectures Dr Steiner gave. The numbers at the end of section tells where it has come from. The references are at the end.

My edits, in italics, are to fill in the gaps and to harmonise the five or so different languages he uses throughout the different lectures. My aim is to make one sensible sequential story, throughout the Seasons.

My dear friends,

In these first lectures you must observe how all agricultural products arise; how Agriculture lives in the totality of the Universe. (3)

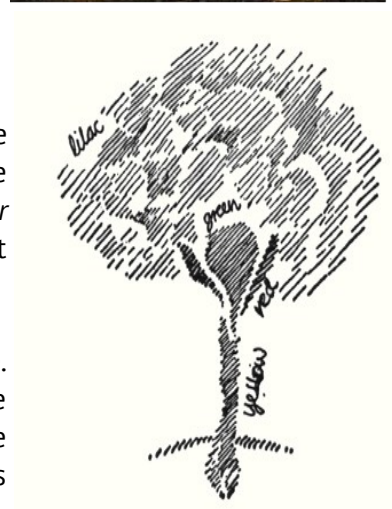
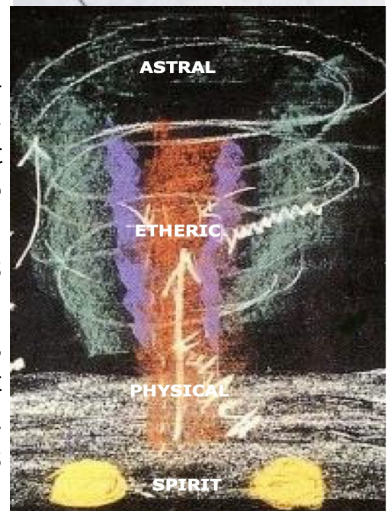
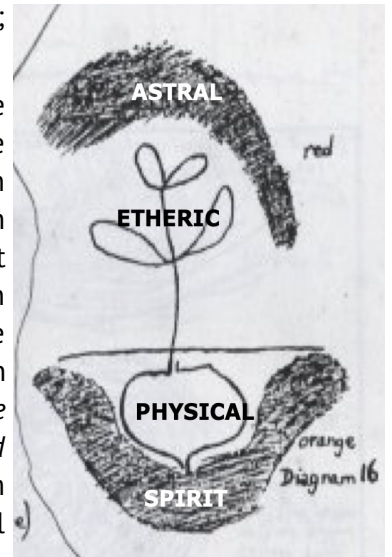
Let us draw the plant in its entirety (Diagram 16). Down here you have the root; up there the unfolding leaves and blossoms. And as above, in the leaves and blossoms, the astral element (red) is acquired from contact with the air, so the ego-potentiality (orange) develops below in the root through contact with the manure. The farm is truly an organism. The astral element is developed above, and the presence of orchard and forest assists in collecting it. If animals feed in the right way on the things that grow above the earth, then they will develop the right *internal Spirit* / ego-potentiality in the manure. If they produce, this ego-potentiality, *it will connect with the plants ego potential and Cosmic Forces, already within the Earth (see gold balls)* and work on the plant from the root, causing it to grow upwards from the root in the right way according to the forces or gravity. It is a wonderful interplay. (5)

The plant-world develops in such a way that it represents only physical corporeality, etheric corporeality; that is, in the actual plants themselves. But when we come to the astral element of the plant-world, we must imagine this astral element of the plant-world as an astral atmosphere which encompasses the earth. The plants themselves have no astral bodies, but the earth is enveloped in an astral atmosphere, and this astrality plays an important part, for instance, in the process of the unfolding of blossom and fruit. The terrestrial plant-world as a whole, therefore, has one uniform, common astral body which nowhere interpenetrates the plant itself, except at most in a very slight degree when *pollination* begins in the blossom. Generally speaking, it floats cloud-like over the vegetation and stimulates blossom and fruit formation. (8)

Plants Astrality

Let us be clear in our minds about the basis of plant-life. Let us picture the surface of the Earth and the plants growing out of it. We know that the physical organization of the plant is permeated by its ether body, *however* the plant would not be able to unfold if the all pervading astrality did not contact it from above by way of the blossom (lilac).

The plant has no astral body *within* it but the astrality touches it from above. As a rule the plant does not absorb the astrality but only allows itself to be touched by it. The plant does not assimilate the astrality but towards the blossom and the fruit there is interplay with the astrality which does not, as



a rule, combine with the ether-body or physical body of the plant.

In a poisonous plant, however, it is different. In a poisonous plant the astrality penetrates into the actual substance of the plant and combines with it. A plant such as belladonna or, let us say, henbane, hyoscyamus, sucks in the astrality either strongly or more moderately and so bears astrality within itself – in an uncoordinated state, of course, for if it were coordinated the plant would have to become an animal. It does not become an animal; the astrality within it is in a compressed state. (9)

Plants Spirit / Ego

The plant egos / *Spirit* dwell in the very centre of the earth, whereas the animal group souls, *and plants astrality*, circle round the earth like trade winds. All these plant egos at the centre point of the earth are mutually interpenetrating beings, for in the spiritual world a law of penetrability prevails and all beings pass through one another. We see the animal group souls moving over the earth like trade winds, and how in their wisdom they carry out what appears to be done by the animals. Studying the plant we see that its head – the root – is directed towards the center of the earth where its group ego is to be found. The earth itself is the outward expression of soul and spirit beings. From the spiritual point of view the plants seem like the nails of our fingers. The plants belong to the earth, and when we look at them singly we do not see a complete entity, for the single plant is just one among the whole number of beings constituting a group ego. In this way we can enter into what the plants themselves feel. The part of the plant that springs up out of the earth, what from within the earth strives up to the surface, is of a different nature from what is growing under the earth. There is a difference between the cutting off of blossoms, stalk, leaves, and the tearing up of a root. The former gives the plant soul a feeling of well-being, of pleasure, just as it gives pleasure to a cow, for example, when the calf sucks milk from her udder. There is actual similarity between the milk of animals, and that part of a plant which pushes its way out of the earth. When in late summer we go through fields where corn is being cut, where the blade is passing through the corn stems, then the whole fields breathe out a feeling of bliss. It is an intensely significant moment when we not only watch the reaping with our physical eyes, but perceive the feeling of contentment sweeping over the earth as the corn falls to the ground. But when the roots of the plants are pulled up, then that is painful for the plant souls. (6)

Curiously enough, the spiritual investigator becomes aware that it is generally impossible to consider the world of plants, this wonderful covering of the earth, as something existing by itself. When confronted with the plant he feels just as he does regarding a finger, which he can consider only as belonging to a complete human organism. The plant world cannot be considered in isolation, because to the view of the spiritual investigator the plant world at once relates itself to the entire planet earth and forms a whole with the earth, just as the finger or piece of bone or the brain forms a whole with our organism. And whoever merely looks at plants by themselves, remaining with the particular, does the same as one who wishes to explain a hand or a piece of human bone by itself. The common nature of plants simply cannot be considered in any other way than as a member of our common planet earth.

An outer circumstance might already suggest to us that, just as every stone has a certain relationship to the earth, so also everything plant-like belongs to it. Just as every stone, every lifeless body, shows its relationship to the earth by being able to fall onto the earth, where it finds a resistance, so every plant shows its relationship to the earth by the direction of its stem, which is always such that it passes through the center of the earth. All stems of plants would cross at the earth's center if we extended them to that point. This means that the earth is able to draw out of its center all those *Cosmic* force radiations that allow the plants to arise.

If we now study grain-producing plants, we discover remarkable little organs present in all these plants. Small structures in the starch cells are discovered. These cells are constructed in quite a remarkable way, so that within them there is something like a loose kernel. These structures have the unique property that the cell wall remains insensitive to the kernel at only one spot. If the

kernel slips to another spot, it touches the cell wall, leading the plant to return to its earlier position. Such starch cells are found in all plants whose main orientation is toward the center of the earth, so that the plant has an organ within that always makes it possible for it to direct itself in its main orientation toward the center of the earth. This discovery, made during the nineteenth century by various scientists, is certainly wonderful, and it is most remarkable if it is simply presented as it is. Natural science *also* shows us that mistletoe does not have those curious starch cells that orient the plant toward the center of the earth.

But now let us turn to something else. If the leaf of a plant is studied, it is discovered that the outer surface is actually always a composite of many small, lens-like structures, similar to the lens in our eye. These 'lenses' are arranged in such a way that the light is effective only if it falls onto the surface of the leaf from a very specific direction. If it falls from another direction, the leaf instinctively begins to turn in such a way that the light can fall into the center of the lens, because when it falls to the side it works in another way. Thus there are organs for light on the surface of the leaves of plants. These light organs, which actually can be compared with a kind of eye, are spread out over the plants, but the plant does not see by means of them; rather the sun being looks through them to the earth being. These light organs bring it about that the leaves of the plant always have the tendency to place themselves perpendicularly to the sunlight.

In this — in the way the plant surrenders itself to the sun's activity in spring and summertime — we have the plant's second main orientation. The first orientation is that of the stem, through which the plants reveal themselves as belonging to the earth's self-consciousness; the second orientation is the one through which the plants express the earth's surrender to the activity of the sun beings.

You will find little by little how the plant covering of our earth is the sense organ through which earth spirit and sun spirit behold each other. The carbohydrates can arise only if the sun spirit and the earth spirit kiss through the plant being.

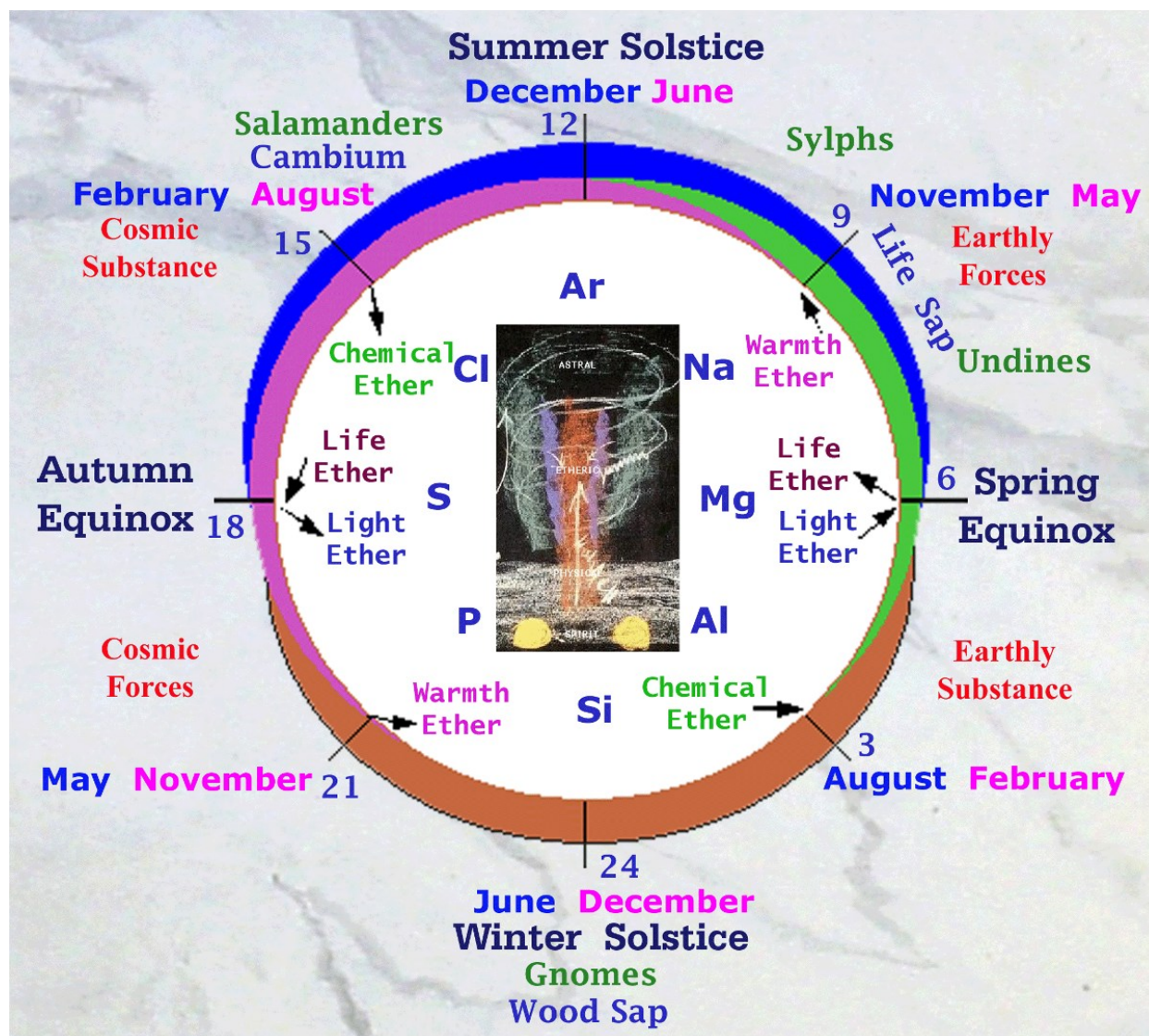
Now, if we are able to consider this earth organism from a spiritual scientific viewpoint, we can go still further. We can ask ourselves, what is the situation with the earth organism as such?

Summer and Winter

In studying an organism we know that alternations of different conditions are revealed. The human and animal organisms reveal a waking and a sleeping condition alternating in time. Can we, from a spiritual scientific viewpoint, find something similar regarding the body of the earth, the earth organism? To outer consideration, what follows may appear to be a mere comparison, but for spiritual research it is not a comparison but a fact. If we study the curious lawfulness of summer and winter, how it is summer on one half of the earth and winter on the other half, how this relationship alternates, and if we pay attention to how this lawfulness — as wintertime and summertime — is to be discerned in relation to all earthly life, then it will no longer appear absurd if spiritual science tells us that winter and summer in the earth organism correspond to waking and sleeping in the organisms around us. It is simply that the earth does not sleep in time in the same way as other organisms but is always awake somewhere and always asleep at some other portion of its being. Waking and sleeping move around spatially: the earth sleeps in the part where there is summer, and it is awake in the part of its being where there is winter. Thus the whole earth organism confronts us spiritually with conditions like waking and sleeping in other organisms.

The **summer** condition of the earth organism consists of a very specific relationship of the earth to the sun, and because we are dealing with a living, spirit-filled organism we may say that **it surrenders itself** to an activity that proceeds spiritually from the sun. In the **winter** condition the earth organism **closes itself off** from this sun activity, drawing itself together into itself. Now let us compare this condition with human sleep. I will now speak of what appears to be a mere analogy; spiritual science, however, provides the evidence for these observations.

If we study the human being in the evening, when he is tired, as his consciousness is diminishing, we find that all thoughts and feelings that enter our soul during the day from the outside, all pleasure and suffering, joy and pain, sink into an indefinite darkness. During this time, the human



spirit being – as we have shown in the lecture about the nature of sleep³ – passes out of the human physical body and enters the spiritual world, surrendering itself to the spiritual world. In this sleep condition it is a curious fact that the human being becomes unconscious. For the spiritual investigator (we will see how he comes to know this) it is revealed that the inner aspect of the human being, the astral body and ego, actually draw themselves out of the physical and etheric bodies, but they do not simply draw themselves out and float over him like a cloud formation; rather this whole inner aspect of the human being spreads itself out, pours itself out over the whole planetary world around us. As incredible as it may seem, it is nevertheless revealed that the human soul pours itself out in a unified way over the astral realm. The investigators who were acquainted with this realm knew well why they called what departs from the physical the ‘astral body.’ The reason was that this inner element draws out of heavenly space, with which it forms a unity, the forces it needs in order to replace what the day’s efforts and work used up from the physical body. Thus the human being in sleep passes into the great world and in the morning draws himself back within the limits of his skin, into the small human world, into the microcosm. There, because his body offers him resistance, he again feels his ego, his self-consciousness.

This breathing out and breathing in of the soul is a wonderful alternation in human life. Sleep for Novalis means the digestion of the soul by the body. Novalis is always conscious that in sleep the soul becomes one with the universe and is digested, so that the human being can be further helped in the physical world.

With respect to his inner being, then, the human being alternates in such a way that in the daytime he draws himself together into the small world, into the limits of his skin, and then expands into the great world during the night, drawing forth through surrender forces from that world in which

he is then imbedded. We will not understand the human being unless we understand him as formed out of the entire macrocosm.

For that part of the earth where it is summer, there is something similar to what goes on in the human being in the condition of sleep. The earth gives itself to everything that comes down from the sun and forms itself as it should form itself under the influence of the sun activity. In that part of the earth where it is winter, it closes itself off from the influence of the sun, lives within itself. There it is the same as when the human being has drawn together into the small, inner world, living in himself, while for the part of the earth where it is summer it is the same as when the human being is surrendered to the whole outer world.

There is a law in the spiritual world: if we direct our attention to spiritual entities far removed from one another – such as, for example, the human being here on one side and the earth organism on the other – the states of consciousness must be pictured as reversed in a certain sense. With the human being, stepping out into the great world is the sleep condition. For the earth, the summer (which one would be inclined to consider a waking condition) is something that can only be compared with the human being falling asleep. The human being steps out into the great world when he falls asleep; in summer the earth with all its forces enters the realm of sun activity, only we must be able to think of the earth and the sun as spirit-filled organisms.

In wintertime, when the earth rests within itself, we must be able to think of its condition as corresponding to the waking condition of the human being, although it may be tempting to consider winter as the earth's sleep. When we consider entities as different from one another as the human being and the earth, however, the states of consciousness appear reversed in a certain way. Now, what does the earth accomplish when it is under the influence of surrender to the sun being, to the sun spirit? To have an easier comparison, we would do well to turn the concepts around now. The earth's surrender to the sun being is simply something that may be compared spiritually with the condition of the human being when he awakens in the morning and emerges out of the dark womb of existence, out of the night, into his joys and sorrows. When the earth enters the realm of sun activity – although this could be compared with the sleep condition of the human being – all the forces that sprout forth from the earth allow the resting winter condition of the earth to pass over into the active, the living, summer condition.

What, then, are the plants in this whole web of existence? We could say that when spring approaches, the earth organism begins to think and to feel, because the sun with its being lures out the thoughts and feelings. The plants are nothing but a kind of sense organ for the earth organism, awakening anew every spring, so that the earth organism with its thinking and feeling can be in the realm of the sun activity. Just as in the human organism light creates the eye for itself in order to be able to manifest through the eye as 'light,' so every spring the sun organism creates for itself the plant covering in order to look at itself, to feel, to sense, to think by means of this plant covering. The plants cannot directly be considered the thoughts of the earth, but they are the organs through which the awakening organization of the earth in spring, together with the sun, develops its thoughts and feelings. Just as we can see our nerves emanating from the brain, developing our feeling and conceptual life through the eyes and ears together with the nerves, so the spiritual investigator sees in what transpires between earth and sun with the help of the plants the marvelous weaving of a cosmic world of thoughts, feelings, and sensations. The spiritual investigator finds that the earth is surrounded not merely by the mineral air of the earth, by the purely physical earth atmosphere, but by an aura of thoughts and feelings. For spiritual research the earth is a spiritual being whose thoughts and feelings awaken every spring, and throughout the summer they pass through the soul of our entire earth.

The plant world, however, which is a part of our entire earth organism, provides the organs through which our earth can think and feel. Woven into the spirit of the earth are the plants, just as our eyes and ears are woven into the activities of our spirit.

In spring a living, spirit-filled organism awakens, and in the plants we can see something that is

pushed out of the countenance of our earth in some realm where it wants to begin to feel and think. Just as everything in the human being tends toward a self-conscious ego, so it is also in the realm of plants. The whole plant world belongs to the earth. I have already said that a person would be close to insanity if he did not think of how all feelings, sensations, and mental images are directed toward our ego. Similarly, everything the plants mediate during summertime is directed toward the earth's center, which is the earth ego. This should not be said merely symbolically! As the human being has his ego, so the earth has its self-conscious ego. That is why all plants strive toward the earth's center. That is why we may not consider plants by themselves but rather must consider them in interaction with the self-conscious ego of the earth. What unfolds itself as thoughts and sensations of the earth is similar to the thoughts and sensations that live in us, similar to whatever arises and disappears in us during our waking state, what lives in us astrally, if we speak from the viewpoint of spiritual science.

Thus we cannot picture the earth only as a physical structure, for the physical structure is for us something like our own physical body, which can be seen with the outer eyes and touched with the hands, and which is observed by outer science. This is the earth body that present-day astronomy or geology studies. Then we have to direct our attention to what in the human being we have come to know as the etheric body or life body. The earth also has such an etheric body, and it also has an astral body. This is what awakens every spring as the thoughts and feelings of the earth, which recede when winter approaches so that the earth rests in its own ego, closed off within itself, retaining only what it needs in order, through memory, to carry over the preceding into the following, retaining in the plant's seed forces what it has conquered for itself. Just as the human being, when he falls asleep, does not lose his thoughts and sensations but finds them again the next morning, so the earth, awakening again from sleep in the spring, finds the seed forces of the plants in order to permit what has been conquered in an earlier time to emerge again from the living memory of the seed forces.

When regarded in this way, the plants can be compared with our eyes and ears. What our senses are for us, the plants are for the earth organism. But what perceives, what achieves consciousness, is the spiritual world streaming down from the sun to the earth. This spiritual world would not be able to achieve consciousness if it did not have its sense organs in the plants, mediating a self-consciousness just as our eyes and ears and nerves mediate our self-consciousness. This makes us aware that we speak correctly only if we say that those beings who stream from the sun down to the earth, unfolding their spiritual activity, encounter from spring through summertime the being that belongs to the earth itself. In this exchange the organs are formed through which the earth perceives those beings, for the plants do not perceive. It is a superstition, shared also by natural science, when it is said that the plant perceives. The spiritual entities that belong to the earth activity and the sun activity perceive through the plant organs, and these entities direct toward the center of the earth all organs they need in order to unite them with the center of the earth. Thus what we have to see behind the plant covering are the spiritual entities that weave around the earth and have their organs in the plants. (7)

The Farm

A farm is true to its essential nature, in the best sense of the word, if it is conceived as a kind of individual entity in itself — a self-contained individuality. Every farm should approximate to this condition. This ideal cannot be absolutely attained, but it should be observed as far as possible. Whatever you need for agricultural production, you should try to possess it within the farm itself (including in the "farm," needless to say, the due amount of cattle). Properly speaking, any manures or the like which you bring into the farm from outside should be regarded rather as a remedy for a sick farm. That is the ideal. A thoroughly healthy farm should be able to produce within itself all that it needs.

We shall see presently why this is the natural thing. So long as one does not regard things in their true essence but only in their outer material aspect, the question may justifiably arise: Is it not a matter of indifference whether we get our cow-dung from the neighbourhood or from our own farm?

But it is not so. Although these things may not be able to be strictly carried out, nevertheless, if we wish to do things in a proper and natural way, we need to have this ideal concept of the necessary self-containedness of any farm.

You will recognise the justice of this statement if you consider the Earth on the one hand, from which our farm springs forth, and on the other hand, that which works down into our Earth from the Universe beyond. Nowadays, people are wont to speak very abstractly of the influences which work on to the Earth from the surrounding Universe. They are aware, no doubt, that the Sun's light and warmth, and all the meteorological processes connected with it, are in a way related to the form and development of the vegetation that covers the soil. But present-day ideas can give no real information as to the exact relationships, because they do not penetrate to the realities involved. We shall have to consider the matter from various standpoints. Let us to-day choose this one: let us consider, to begin with, the soil of the Earth which is the foundation of all Agriculture.

I will indicate the surface of the Earth diagrammatically by this line. The surface of the Earth is generally regarded as mere mineral matter – including some organic elements, at most, inasmuch as there is formation of humus, or manure is added. In reality, however, the earthly soil as such not only contains a certain life – a vegetative nature of its own – but an effective astral principle as well; a fact which is not only not taken into account to-day but is not even admitted nowadays.

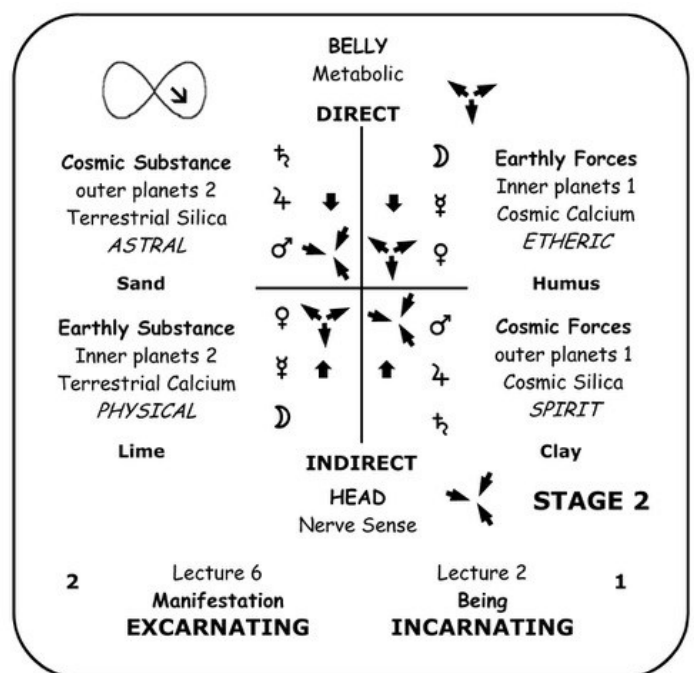
But we can go still further. We must observe that this inner life of the earthly soil (I am speaking of fine and intimate effects) is different in summer and in winter. Here we are coming to a realm of knowledge, immensely significant for practical life, which is not even thought of in our time.

Taking our start from a study of the earthly soil, we must indeed observe that the surface of the Earth is a kind of organ in that organism which reveals itself throughout the growth of Nature. The Earth's surface is a real organ, which – if you will – you may compare to the human diaphragm. (Though it is not quite exact, it will suffice us for purposes of illustration). We gain a right idea of these facts if we say to ourselves: Above the human diaphragm there are certain organs – notably the head and the processes of breathing and circulation which work up into the head. Beneath it there are other organs.

If from this point of view we now compare the Earth's surface with the human diaphragm, then we must say: In the individuality with which we are here concerned, the head is beneath the surface of the Earth, while we, with all the animals, are living in the creature's belly!

Whatever is above the Earth, belongs in truth to the intestines of the "agricultural individuality," if we may coin the phrase. We, in our farm, are going about in the belly of the farm, and the plants themselves grow upward in the belly of the farm. Indeed, we have to do with an individuality standing on its head. We only regard it rightly if we imagine it, compared to man, as standing on its head. With respect to the animal, as we shall presently see, it is a little different.

Why do I say that the agricultural individuality is standing on its head? For the following reason. Take everything there is in the immediate neighbourhood of the Earth by way of air and water vapours and even warmth. Consider, once more, all that element in the neighbourhood of the Earth in which we ourselves are living and breathing and from which the plants, along with us, receive their outer warmth and air, and even water. All this actually corresponds to that which would represent, in man, the abdominal organs. On the other hand, that which takes place in the interior of the Earth beneath the Earth's surface – works upon plant-growth in the same way in which our



head works upon the rest of our organism, notably in childhood, but also throughout our life. There is a constant and living mutual interplay of the above-the-Earth and the below-the-Earth.

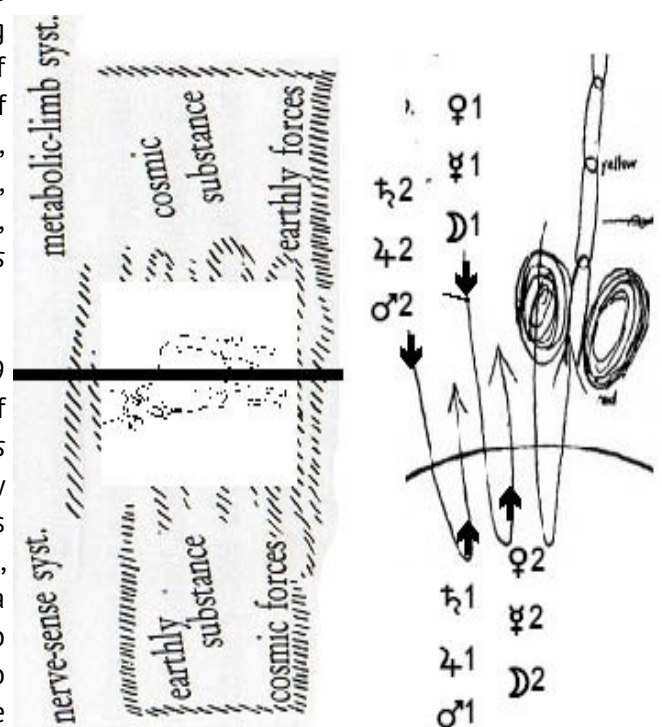
Physical Formative Forces

And now, to localise these influences, *into the Physical Formative Forces*, I beg you to observe the following. The *Force* activities above the Earth are immediately dependent on Moon, Mercury and Venus supplementing and modifying the influences of the Sun. The so-called “planets near the Earth” extend their *force* influences to all that is above the Earth's surface. On the other hand, the distant planets – those that revolve outside the circuit of the Sun – work upon *the force activities* that *are* beneath the Earth's surface, assisting those influences which the Sun exercises from below the Earth. Thus, so far as *the Force aspects of plant-growth* is concerned, we must look for the influences of the distant Heavens beneath, and of the Earth's immediate cosmic environment above the Earth's surface.

Once more: all that works inward from the far spaces of the Cosmos, *as Cosmic Forces*, to influence the growth of plants, works not directly – not by direct radiation – but in this way: It is first received by the Earth *from the Cosmic Substance*, and the Earth then rays it upward again. Thus, *the Cosmic Force* influences that rise upward from the earthly soil – beneficial or harmful for the growth of plants – are in reality cosmic influences rayed back again. *The Cosmic Substance* is working directly in the air and water over the Earth. The direct radiation from the Cosmos, *coming via the Cosmic Substance* is stored up beneath the Earth's surface *as Cosmic Forces* and works back from there. Now these relationships determine how the earthly soil, according to its constitution, works upon the growth of plants. (We shall take plant-growth to begin with, and afterwards extend it to the animals). (3)

With the Substance stream we must learn to distinguish those *Earthly Forces* which arise in the cosmos but are absorbed by the earth and work upon plant-growth as *Earthly Substance*, from within the earth. These forces come from Mercury, Venus and Moon and act not directly, but through the mediation of the earth. They must be taken into account if we wish to follow up how the mother-plant gives rise to a daughter-plant, and so on. On the other hand, we have to consider the *Cosmic Substance* forces taken by the plant from the outer-earthly, and brought to it by way of the atmosphere from the outer planets. Broadly speaking, we may say that the forces coming from the nearer planets are very much influenced by the workings of lime in the soil, while those coming from the distant planets fall under the influence of silicon. And, in fact, *the Cosmic Force* workings of silicon, even though they proceed from the earth, act as mediators of the forces coming from Jupiter, Mars and Saturn, but not for those of Moon, Mercury and Venus, *which also work in the Earth, as Earthly Substance*.

Now I want you to imagine that Diagram No. 9 represents the earth level, where the influences of Venus, Mercury and Moon; enter *as Earthly Forces* into the earth and stream again from below upwards as *Earthly Substance*. These are the forces which cause the plant to grow during the season, later produce the seed, and by means of this seed a new plant, a second plant, then yet a third and so on. (I indicate this schematically). All this goes into the power of reproduction and streams on into the succeeding generations. The *Cosmic Substance*



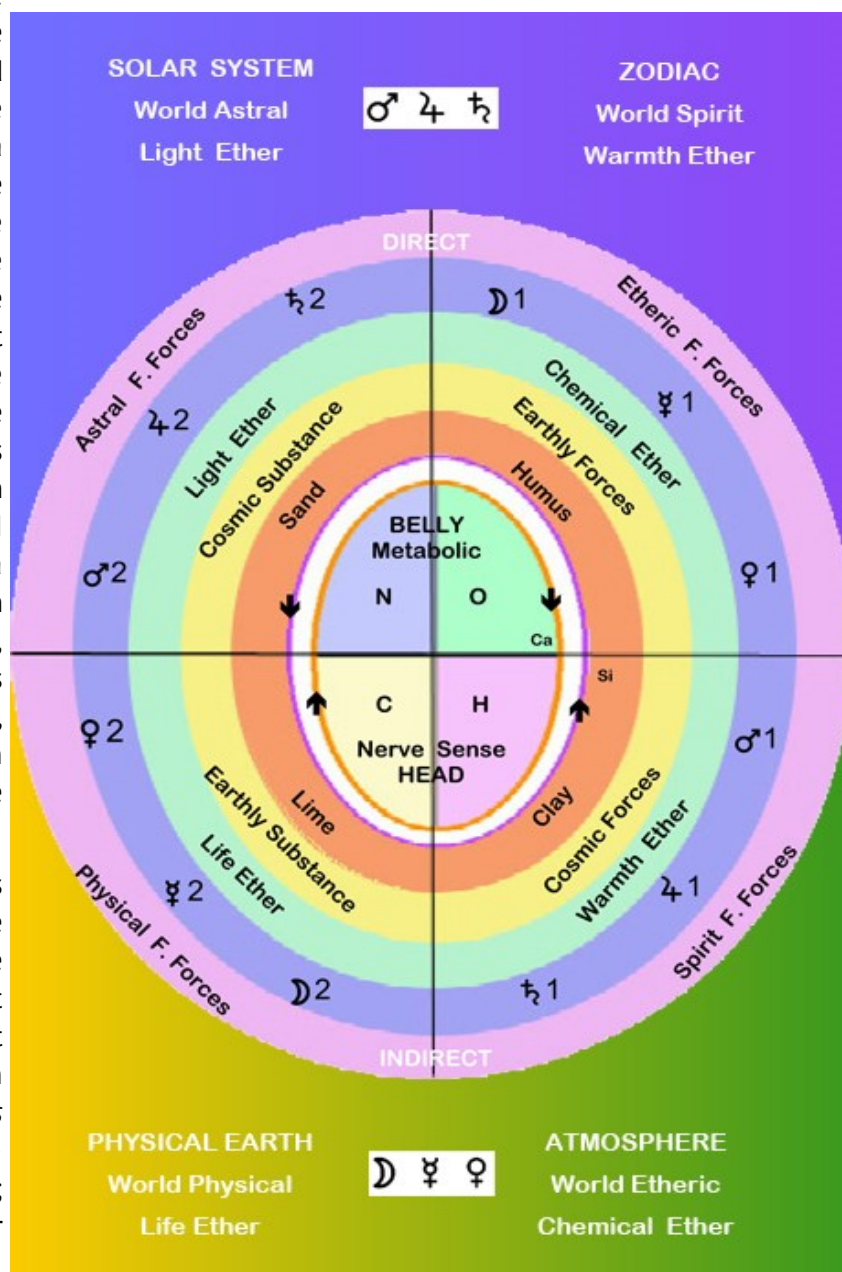
forces, however, which take the other path, remaining above the earth level, come from the *secondary* distant planets. I can draw this schematically in this way. These forces cause the plant either to spread into its surroundings or to become fat and juicy, to build matter into itself such as we can use for food because it is produced again and again in a continuous stream.

Take for example the flesh of fruit - an apple or a plum - which we can break off and eat; all this is due to the *secondary* workings from the distant planets. (4)

Consider the earthly soil. To begin with, we have those *Cosmic Substance* influences that depend on the farthest distances of the Cosmos – the farthest that come into account for earthly processes. These effects are found in what is commonly called sand and rock and stone. Sand and rock – substances impermeable to water, which, in the common phrase, “contain no foodstuffs” – are in reality no less important than any other factors. They are most important for the unfolding of the growth-processes, and they depend throughout on the influences of the most distant cosmic *substance* forces. And above all – improbable as it appears at first sight – it is through the sand, with its silicious content, that there comes into the Earth what we may call the life-ethereal and the chemically influential elements of the soil. These influences then take effect as they ray upward again from the Earth, *as Cosmic Forces*.

The way the soil itself grows inwardly alive and develops its own chemical processes, depends above all on the composition of the sandy portion of the soil. What the plant-roots experience in the soil depends in no small measure on the extent to which the cosmic life and cosmic chemistry are seized and held by means of the stones and the rock, which may well be at a considerable depth beneath the surface. Therefore, wherever we are studying plant growth, we should be clear in the first place as to the geological foundation out of which it arises. For those plants in which the root-nature as such is important, we should never forget that a silicious ground – even if it be only present in the depths below – is indispensable. I would say, thanks be to God that silica is very widespread on the Earth – in the form of silicic acid, for instance, and in other compounds. It constitutes 47-48% of the surface of the Earth, and for the quantities we need we can reckon practically everywhere on the presence of the silicic activity.

But that is not all. All that is thus connected, by way of silicon, with the root-nature, must also be able to be led upward through the plant. It must flow upward. There must be constant interaction between what is drawn in from the Cosmos by the silicon, *as Cosmic Forces* and what takes place – forgive me! – in the “belly” up above; *as Cosmic Substance* for by the latter



process the “head” beneath must be supplied with what it needs. The “head” is supplied *with Cosmic Forces* out of the Cosmos, but it must also be in mutual interaction with what is going on *with the Cosmic Substance* in the “belly,” above the Earth’s surface. In a word, that which pours down from the Cosmos and is caught up beneath the surface, *as Cosmic Forces*, must be able to pour upward again. And for this purpose is the clayey substance in the soil. Everything in the nature of clay is in reality a means of transport, for the influences of cosmic *force* entities within the soil, to carry them upward again from below.

When we pass on to practical matters, this knowledge will give us the necessary indications as to how we must deal with a clayey soil, or with a silicious soil, according as we have to plant it with one form of vegetation or another. First we must know what is really happening. However else clay may be described, however, else we may have to treat it so as to make it fertile – all that, no doubt, is most important in the second place, but the first thing is to know that clay is the carrier of the cosmic upward stream.

But this up-streaming of the cosmic influences is not all. There is also the other process which I may call the terrestrial or earthly – that process which is *also* going on in the “belly” and which depends on a kind of external “digestion.” For plant-growth, in effect, all that goes on through summer and winter in the air above the Earth is essentially a kind of digestion. All that is thus taking place through a kind of digestive process, must in its turn be drawn downward into the soil. Thus a true mutual interaction will arise with all the forces and fine homeopathic substances which are engendered by the water and air above the Earth. All this is drawn down into the soil by the greater or lesser limestone content of the soil. The limestone content of the soil itself, and the distribution of limestone substances in homeopathic dilution immediately above the soil – all this is there to carry into the soil the immediate *Earthly Forces* process.

In due time there will be a science of these things – not the mere scientific jargon of to-day – and it will then be possible to give exact indications. It will be known, for instance, that there is a very great difference between the warmth that is above the Earth’s surface that is to say, the warmth that is in the *Earthly Force* domain of Sun, Venus, Mercury and Moon – and that warmth which makes itself felt within the Earth; which is under the *Cosmic Force* influence of Mars, Jupiter and Saturn. For the plant, we may describe the one kind as leaf-and-flower warmth, and the other as root warmth. These two warmths are essentially different, and in this sense, we may well call the warmth above the Earth dead, and that beneath the Earth’s surface living.

The warmth beneath the Earth decidedly contains some inner principle of life, *that it gains from contact with the Earth’s Etheric body*. It is alive; moreover in winter it is most of all alive. If we human beings had to experience the *etherized* warmth which works within the Earth, we should all grow dreadfully stupid, for to be clever we need to have dead warmth brought to our body. But the moment the warmth is drawn into the Earth by the limestone-content of the soil, or by other substantialities within the Earth – the moment any outer warmth passes over into inner warmth – it is changed into a certain condition of vitality, however delicate.

People to-day are well aware that there is a difference between the air above the soil and the air within, but they do not observe that there is also this difference between the warmth above and within. They know that the air beneath the surface contains more carbonic acid, and the air above, more oxygen, but again they do not know the reason. The reason is that the air too is permeated by a delicate vitality the moment it is absorbed and drawn into the Earth’s *Etheric activity*.

So it is both with the warmth and with the air; they take on a slightly living quality when they are received into the Earth. The opposite is true of the water and of the solid earthy element itself. They become still more dead inside the Earth than they are outside it. They lose something of their external life. Yet in this very process they become open to receive the most distant cosmic forces.

(3)

To the outwardly perceptible, visible world *of Substance* there belongs the invisible world *of Force* and these, taken together, form a whole. The marked degree to which this is the case first appears in

its full clarity when we turn our attention away from the animals to the plants.

Plant-life, as it sprouts and springs forth from the earth, immediately arouses our delight, but it also provides access to something which we must feel as full of mystery. In the case of the animal, though certainly its will and whole inner activity have something of the mysterious, we nevertheless recognize that this will is actually there, and is the cause of the animal's form and outer characteristics. But in the case of the plants, which appear on the face of the earth in such magnificent variety of form, which develop in such a mysterious way out of the seed with the help of the earth and the encircling air – in the case of the plant we feel that some other factor must be present in order that this plant-world may arise in the form it does.

The earthly and cosmic forces work in the processes of agriculture through the substances of the Earth. You know that in terms of contemporary chemistry, the main ingredients of albumen are the four main natural substances, carbon, oxygen nitrogen and hydrogen, and , in addition, sulphur, as, so to speak, a omnipresent mediator, and homeopathic agent in the operations of the other four. *In the great spheres of nature we can identify, Hydrogen as the dominant chemical element of the cosmic spaces, populated by the stars. Nitrogen is found concentrated in the atmospheres of some planets, with our own atmosphere comprising 80% nitrogen. Oxygen, we find only in our atmosphere, at 20%, as a expression of the very life forms it helps to support, while our Earthly forms are primarily Carbon based.*

What interests us here is the fact that the function performed in the external world by C,H,O,N and their mediator sulphur is , *the same activity as* is being individualized in man through the four organic systems. You will see then that the *Spirit inspired* Ego organisation is connected with the Hydrogen in the same way that the Physical organisation is connected with Carbon, the Etheric organisation with Oxygen and the Astral organisation with Nitrogen. The composition of the external atmosphere is of such a nature as to furnish the ratio for the connection between the astral and etheric bodies and concurrently between their partners the physical body and ego. *Where these chemicals are found, we see the action of the energetic activities* (10)

Elementals

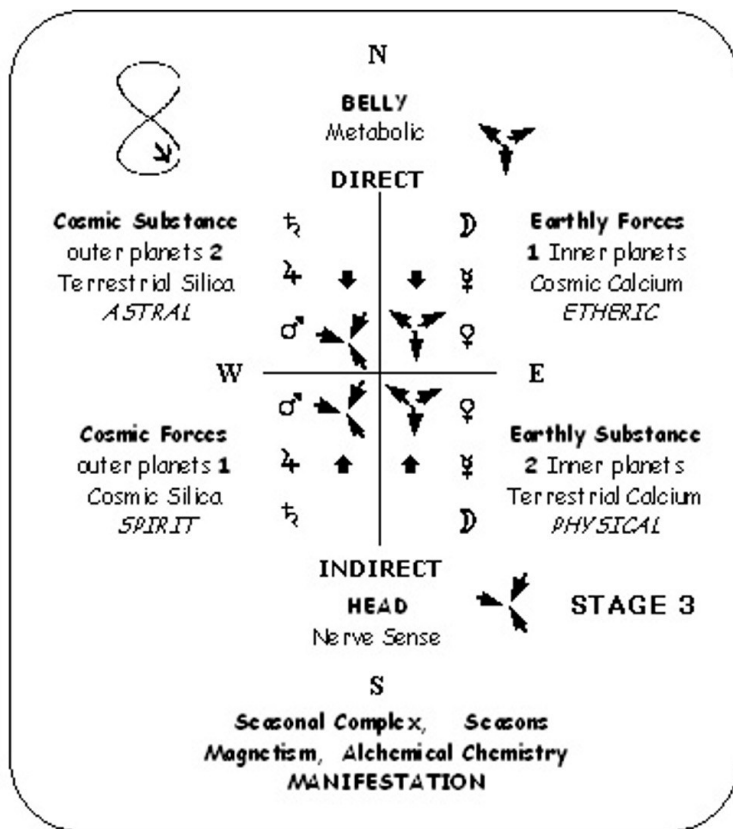
When spiritual vision is directed to the plant-world, we are immediately led to a whole host of beings, which were known and recognized in the old times of instinctive clairvoyance, but which were afterwards forgotten and today remain only as names used by the poet, names to which modern man ascribes no reality. To the same degree, however, in which we deny reality to the beings which whirl and weave around the plants, to that degree do we lose the understanding of the plant-world. This understanding of the plant-world, which, for instance, would be so necessary for the art of healing, has been entirely lost to present-day humanity.

We have already recognized a very significant connection between the world of the plants and the world of the butterflies; but this too will only come rightly before our souls when we look yet more deeply into the whole weaving and working of plant-life.

Plants send down their roots into the ground. Anyone who can observe what they really send down and can perceive the roots with spiritual vision (for this he must have) sees how the root-nature is everywhere surrounded, woven around, by elemental nature spirits. And these elemental spirits, with an old clairvoyant perception designated as gnomes and which we may call the root-spirits, can actually be studied by an imaginative and inspirational world-conception, just as human life and animal life can be studied in the sphere of the physical. We can look into the soul-nature of these elemental spirits, into this world of the spirits of the roots.

These root-spirits, are, so to say, a quite special earth-folk, invisible at first to outer view, but in their effects so much the more visible; for no root could develop if it were not for what is mediated between the root and the earth-realm by these remarkable root-spirits, which bring the mineral element of the earth into flux in order to conduct it to the roots of the plants. Naturally I refer to the underlying *energetic* process.

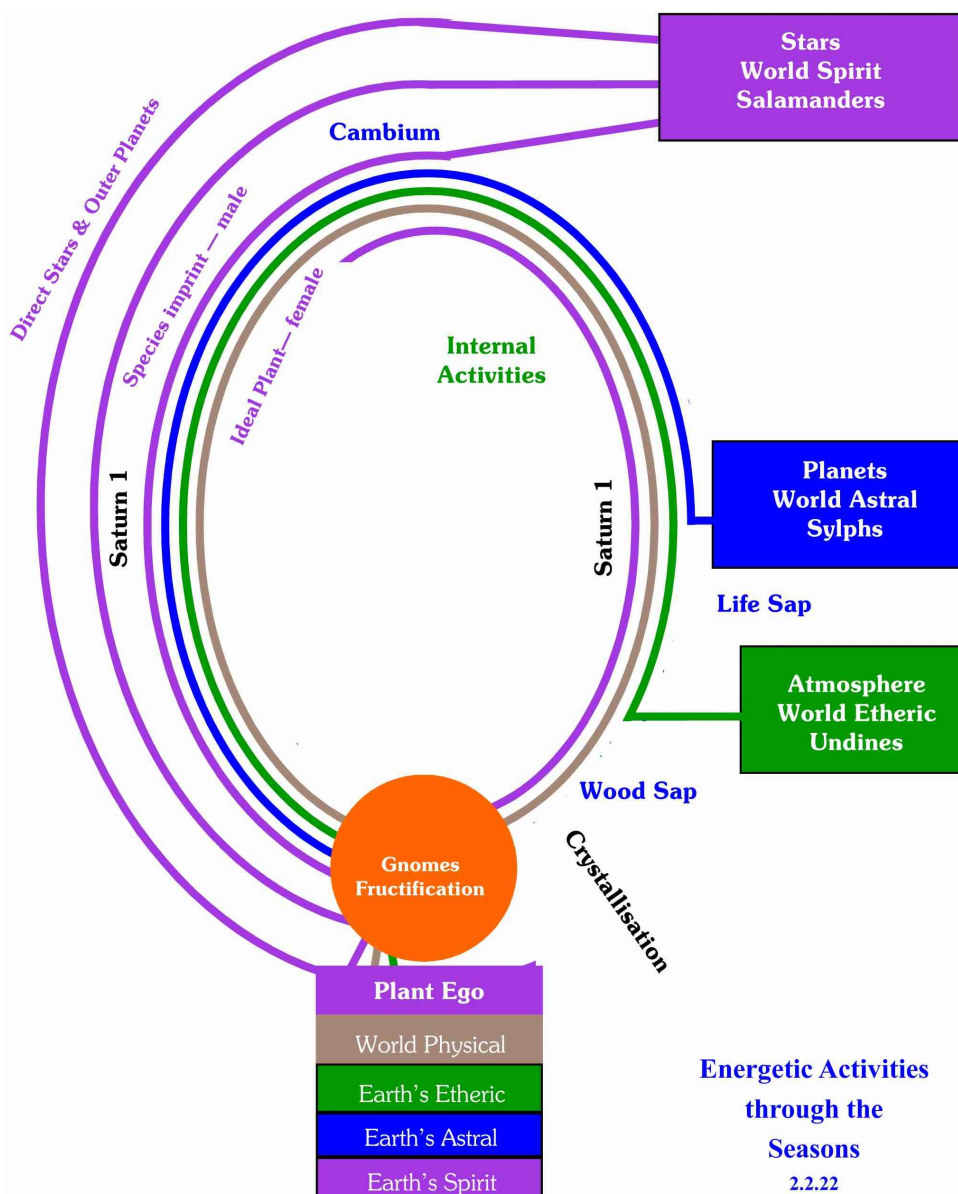
These root-spirits, which are everywhere present in the earth, get a quite particular sense of well



being from rocks and from ores (which may be more or less transparent). But they enjoy their greatest sense of well-being, because here they are really at home, when they are conveying what is mineral to the roots of the plants. And they are completely enfilled with an inner element of spirituality which we can only compare with the inner element of spirituality in the human eye, in the human ear. For these root-spirits are in their spirit-nature entirely sense. Apart from this they are nothing at all; they consist only of sense. They are entirely sense, and it is a sense which is at the same time understanding, which does not only see and hear, but immediately understands what is seen and heard, which in receiving impressions, receives also ideas.

We can even indicate the way in which these root-spirits receive their ideas. We see a plant sprouting out of the earth. The plant comes, as I shall presently show you, into connection

with the extraterrestrial universe; and, particularly at certain seasons of the year, spirit-currents flow from above, *via the Cosmic Substance*, from the blossom and the fruit of the plant down into the roots below, streaming into the earth. And just as we turn our eyes towards the light and see, so do the root-spirits turn their faculty of perception towards what seeps downwards from above, through the plant into the earth. What seeps down towards the root-spirits, that is something which the *Astral* light has sent into the blossoms, which the sun's warmth has sent into the plants, which the air has produced in the leaves, which the distant stars have brought about in the plant's structures. The plant gathers the secrets of the universe, *as the Ideal Plant* and sinks them into the ground, and the gnomes take these secrets into themselves from what seeps down spiritually to them through the plants. And because the gnomes, particularly from autumn on and through the winter, in their wanderings through ore and rock bear with



them what has filtered down to them through the plants, they become those beings within the earth which, as they wander, carry the ideas of the whole universe streaming throughout the earth. We look forth into the wide world. The world is built from universal spirit; it is an embodiment of universal *Cosmic Force* ideas, of universal spirit. The gnomes receive, *them via what the Cosmic Substance has to give*, through the plants, which to them are the same as rays of light are to us, the ideas of the universe, and within the earth carry them in full consciousness from metal to metal, from rock to rock.

We gaze down into the depths of the earth not to seek there below for abstract ideas about some kind of mechanical laws of nature, but to behold the roving, wandering gnomes, which are the light-filled preservers of world-understanding within the earth.

Because these gnomes have immediate understanding of what they see, their knowledge is actually of a similar nature to that of man. They are the compendium of understanding, they are entirely understanding. Everything about them is understanding, an understanding however, which is universal, and which really looks down upon human understanding as something incomplete. The gnomes laugh us to scorn on account of the groping, struggling understanding with which we manage to grasp one thing or another, whereas they have no need at all to make use of thought. They have direct perception of what is comprehensible in the world; and they are particularly ironical when they notice the efforts people have to make to come to this or that conclusion. Why should they do this? say the gnomes – why ever should people give themselves so much trouble to think things over? We know everything we look at. People are so stupid – say the gnomes – for they must first think things over.

And I must say that the gnomes become ironical to the point of ill manners if one speaks to them of logic. For why ever should people need such a superfluous thing – a training in thinking? The thoughts are already there. The ideas flow through the plants. Why don't people stick their noses as deep into the earth as the plant's roots, and let what the sun says to the plants trickle down into their noses? Then they would know something! But with logic – so say the gnomes – there one can only have odd bits and pieces of knowledge.

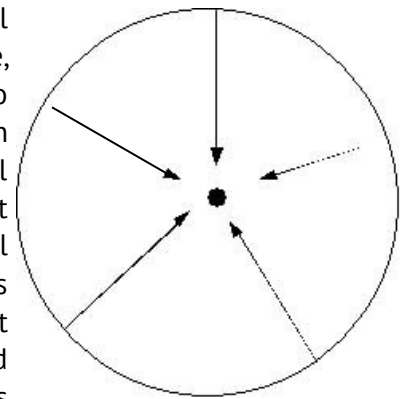
Thus the gnomes, inside the earth, are actually the bearers of the *Spirit's* ideas of the universe, of the world-all. But for the earth itself they have no liking at all. They bustle about in the earth with ideas of the universe, *within the cosmic forces*, but they actually hate what is earthly *substance*. This is something from which the gnomes would best like to tear themselves free. Nevertheless they remain with the earthly – you will soon see why this is – but they hate it, for the earthly *substance* threatens them with a continual danger. The earth continually holds over them the threat of forcing them to take on a particular form, the form of those creatures I described to you in the last lecture, the amphibians, and in particular of the frogs and the toads. The feeling of the gnomes within the earth is really this: If we grow too strongly together with the earth, we shall assume the form of frogs or toads. They are continually on the alert to avoid being caught in a too strong connection with the *earthly substance*, to avoid taking on earthly form. They are always on the defensive against this earthly form, which threatens them as it does because of the element in which they exist. They have their home in the earthly-moist element; there they live under the constant threat of being forced into amphibian forms. From this they continually tear themselves free, by filling themselves entirely with *Cosmic Force* ideas of the extra-terrestrial universe. The gnomes are really that element within the earth which represents the extra-terrestrial, because they must continually reject a growing together with the earthly *substance*; otherwise, as single beings, they would take on the forms of the amphibian world. And it is just from what I may call this feeling of hatred, this feeling of antipathy towards the earthly, that the gnomes gain the *Cosmic Force's* power of driving the plants up out of the earth. With the fundamental force of their being they unceasingly thrust away the earthly, and it is this thrusting that determines the upward direction of the plant's growth; they push the plants up with them. It accords with the nature of the gnomes in regard to the earthly to allow the plant to have only its roots in the earth, and then to grow upwards out of the earth-sphere; so that it is actually out of the force of their own original nature that the gnomes push the plants out

of the earth and make them grow upwards. (2)

Crystallisation

The mineral substances must emancipate themselves from what is working immediately above the surface of the Earth, if they wish to be exposed to the most distant cosmic forces. And in our cosmic age they can most easily do so – they can most easily emancipate themselves from the Earth's immediate neighbourhood and come under the influence of the most distant cosmic forces down inside the Earth – in the time between the **15th January and the 15th February**; in this winter season. The time will come when such things are recognised as exact indications. This is the season when the strongest formative-forces of crystallisation, the strongest forces of form, can be developed for the mineral substances within the Earth. It is in the middle of the winter. The interior of the Earth then has the property of being least dependent on itself – on its own mineral masses; it comes under the influence of the crystal-forming forces that are there in the wide spaces of the Cosmos.

This then is the situation. Towards the end of January the mineral substances of the Earth have the greatest longing to become crystalline, and the deeper we go into the Earth, the more they have this longing to become purely crystalline within the “household of Nature.” In relation to plant growth, what happens in the minerals at this time is most of all indifferent, or neutral. That is to say, the plants at this time are most left to themselves within the Earth; they are least exposed to the mineral substances. On the other hand, for a certain time before and after this period – and notably before it, when the minerals are, so to speak, just on the point of passing over into the crystalline element of form and shape – then they are of the greatest importance; they ray out the forces that are particularly important for plant-growth.



Thus we may say, approximately in the month of November-December, there is a point of time when that which is under the surface of the Earth becomes especially effective for plant-growth. The practical question is: “How can we really make use of this for the growth of plants?” The time will come when it is recognised, how very important it is to make use of these facts, so as to be able to direct the growth of plants. I will observe at once, if we are dealing with a soil which does not readily or of its own accord carry upward the influences which should be working upward in this winter season, then it is well to add a dose of clay to the soil. (I shall indicate the proper dose later on). We thereby prepare the soil to carry *the Cosmic Forces* upward, which to begin with, *are* inside the Earth and make it effective for the growth of plants. I mean, the crystalline forces which we observe already when we look out over the crystallising snow. (The force of crystallisation, however, grows stronger and more intense the farther we go into the interior of the Earth). This crystallising force must therefore be carried upward at a time when it has not yet reached its culminating point – which it will only attain in January or February.

Thus we derive the most positive hints from knowledge which at first sight seems remote. We get indications that will really help us, where we should otherwise be experimenting in the dark.

Altogether, we should be clear that the whole domain of Agriculture – including what is beneath the surface of the Earth – represents an individuality, a living organism, living even in time. The life of the Earth is especially strong during the winter season, whereas in summer-time it tends in a certain sense to die. (3)

Wood Sap

With the help of the Gnomes and the Cosmic Forces the plant grows out of the ground. The root grows out of the seed. Let us first take a tree; we can then pass to the ordinary plants. We take a tree: the stem grows up. This growth is very remarkable. This stem which grows there, is really only formed because it lets sap mount from the earth, and this sap in mounting carries up with it all kinds of

salts and particles of earthly *substance*; and so the stem becomes hard. When you look at the wood from the stem of a tree, you have a mounting sap, and this sap carries with it fine particles of earth, and all sorts of salts too, for instance, carbonate of soda, iron, etc., into the plants and this makes hard wood. The essential thing is that the sap mounts.

What happens, in reality? The earthy, the solid, becomes fluid! And we have an earthy-fluid substance mounting there. Then the fluid evaporates and the solid remains behind: that is the wood.

You see, this sap which mounts up in the tree – let us call it wood-sap – is not created there but is already contained everywhere in the earth, so that the earth in this respect is really a great living Being, *with its own Etheric, Astral and Spirit activities*. This sap which mounts in the tree, is really present in the whole earth: only in the earth it is something special. It becomes in the tree what we see there. In the earth it is in fact the *etherized sap, working through the Earthly Substance*, which actually gives it life. For the earth is really a living Being; and that which mounts in the tree is in the whole earth and through it the earth lives. In the tree it loses its life-giving quality; it becomes merely a chemical; it has only chemical qualities.

So when you look at a tree, you must say to yourself: the earthy-fluidic in the tree – that has become chemical; underneath in the earth it was still alive. So the wood-sap has partly died, as it mounted up in the tree. Were this all, never would a plant come into existence, but only stumps, dying at the top, in which chemical processes are at work. (1)

Once the plant has grown upwards, once it has left the domain of the gnomes and has passed out of the sphere of the moist-earthly element into the *atmospheric Etheric* sphere of the moist-airy *Earthly Forces*, the plant develops what comes to outer physical formation in the leaves. But in all that is now active in the leaves other beings are at work, water-spirits, elemental spirits of the watery element, to which an earlier instinctive clairvoyance gave among others the name of undines. Just as we find the roots busied about, woven-about by the gnome-beings in the vicinity of the ground, and observe with pleasure the upward-striving direction which they give, we now see these *Etheric* water-beings, these elemental beings of the water, these undines in their connection with the leaves. (2)

Say we plant the seed of some plant in the Earth. Here in this seed we have the stamp or impress of the whole Cosmos – from one cosmic aspect or another, *carried in the Astral sphere by the Saturn I processes*. The constellation takes effect in the seed; thereby it receives its special *archetypal* form. Now, the moment it is planted in the Earth-realm, the external forces of the Earth influence it very strongly, and it is permeated every moment with a longing to deny the cosmic process – that is to say, to grow hypertrophied, to grow out in all manner of directions. For that which is working as *Earthly Forces*, above the Earth does not really want to preserve this form.

Humus

The seed must be driven to the state of chaos, *at pollination*. On the other hand, when the first beginnings of the plant are unfolding out of the seed, *at germination*, and at the later stages also – over against the cosmic form which is living as the plant-form in the seed we need to bring the earthly *forces* element into the plant. We must bring the plant nearer to the Earth in its growth. And this we can only do by bringing into the life of the plant such life as is already present on the Earth. That is to say, we must bring into it life that has not yet reached the utterly chaotic state – life that has not yet gone forward to the stage of seed-formation – life, that is to say, which came to an end in the organisation of some plant before it reached the point of seed-formation.

In effect, we must bring into it such life as is already present on the Earth. In this respect, in districts which are well-favoured by fortune, a rich humus-formation comes very largely to man's assistance in "Nature's household." For in the last resort man can but sparingly replace by artificial means the fertility the Earth itself is able to achieve by natural humus-formation. To what is this transformation due? It is due to the fact that that which comes from the plant-life is absorbed by the whole Nature-process. To some extent, all life that has not yet reached the state of chaos rejects the cosmic influences. If such life is also made use of in the plant's growth, the effect is to

hold fast in the plant what is essentially earthly *forces*. The cosmic *force* process works only in the stream which passes upward once more to the seed-formation; while on the other hand the earthly *force* process works in the unfolding of leaf, blossom and so on, and the cosmic only radiates its influences into all this.

The Plant

We can trace the process quite exactly. Assume you have a plant growing upward from the root. At the end of the stem the little grain of seed is formed. The leaves and flowers spread themselves out. Now the earthly *force* element in leaf and flower is the shape and form and the filling of earthly matter. The reason why a leaf or grain develops thick and strong – absorbs inner substantialities, and so on – the reason for this lies in all that which we bring to the plant by way of *earthly* life that has not yet reached the state of chaos. On the other hand, the seed which evolves its *cosmic* force right up the stem (in a vertical direction, not in the circling round) – the seed irradiates the leaf and blossom of the plant with the force of the Cosmos.

We can see this directly. Look at the green plant-leaves. The green leaves, in their form and thickness and in their greenness too, carry an earthly *force* element, but they would not be green unless the cosmic force of the Sun were also living in them. And even more so when you come to the coloured flower; therein are living not only the cosmic forces of the Sun, but also the supplementary forces which the Sun-forces receive from the distant planets – Mars, Jupiter and Saturn, *as Cosmic Substance*. In this way we must look at all plant growth. Then, when we contemplate the rose, in its red colour we shall see the forces of Mars. Or when we look at the yellow sunflower – it is not quite rightly so called, it is called so on account of its form; as to its yellowness it should really be named the Jupiter-flower. For the force of Jupiter, supplementing the cosmic force of the Sun, brings forth the white or yellow colour in the flowers. And when we approach the chicory (*Cichoriuns Intybus*), we shall divine in the bluish colour the influence of Saturn, supplementing that of the Sun. Thus we can recognise Mars in the red flower, Jupiter in the yellow or white, Saturn in the blue, while in the green leaf we see essentially the Sun itself. But that which thus shines out in the colouring of the flower works as a *cosmic force* most strongly in the root. For the forces that live and abound in the distant planets are working, as we have seen, down there below within the earthly soil.

It is so indeed. We must say to ourselves: Suppose we pull a plant out of the Earth. Down below we have the root. In the root there is the cosmic *force* nature, whereas in the flower most of all there is the earthly *force*, the cosmic *substance* being only present in the delicate quality of the colouring and shading. If on the other hand the earthly *substance* nature is to live strongly in the root, then it must shoot into form. For the plant always has its form from that which can arise within the earthly realm. That which expands the form is *the etheric inspired earthly processes*. Thus if the root is ramified and much-divided, then, as in the flower's colouring the cosmic nature is working upward, *stimulating the Cosmic Substance*, so here the earthly nature is working downward, *stimulating the Earthly Substance*. Therefore the cosmic roots are those that are more or less single in form, whereas in highly ramified roots we have a working of the earthly *forces* nature downward into the soil, just as in colour we have a working-upward of the cosmic *forces* nature into the flower.

The Sun-quality is in the midst between the two. The Sun-nature lives most of all in the green leaf, in the mutual interplay between the flower and the root and all that is between them. The Sun-quality is really that which is related, as a "diaphragm" (for so we called it in picture 9) with the surface of the earth. The cosmic *forces* are associated with the interior of the Earth and works upward into the upper parts of the plant, *interacting with the Cosmic Substance*. The earthly *forces*, which are localised above the surface of the earth, works downward, being carried down into the plant with the help of the limestone element, *to stimulate the Earthly Substance*.

Observe those plants in which the limestone strongly draws the earthly *force* nature downward into the roots. These are the plants whose roots shoot out in all directions with many ramifications,

such, for instance, as the food fodder plants — I do not mean turnips or the like, but plants like sainfoin. Such things must be recognised in the form of the plant. To understand the plant, we must recognise the form of the plant and from the colour of the flower, the extent to which the cosmic and the earthly *processes* are working there.

Assume that by some means we cause the cosmic *forces* to be strongly retained — held up within the plant itself. Then it will not reveal itself to any great extent. It will not shoot out into blossom but will express itself in a stalk-like nature. Where, now, according to the indications we have given, does the cosmic nature live in the plant? It lives in the silicious element.

Look at the equisetum plant. It has this peculiarity: it draws the cosmic nature to itself; it permeates itself with the silicious nature. It contains no less than 90% of silicic acid. In equisetum the cosmic *force* is present, so to speak, in very great excess, yet in such a way that it does not go upward and reveal itself in the flower but betrays its presence in the growth of the lower parts.

Or let us take another case. Suppose that we wish to hold back *the cosmic forces* in the root-nature of a plant that which would otherwise tend upward through the stem and leaf. No doubt this is not so important in our present earthly epoch, for through various conditions we have already largely fixed the different species of plants. In former epochs — notably in primeval epochs — it was different. At that time it was still possible quite easily to transform one plant into another; hence it was very important to know these things. To-day too, it is important if we wish to find what conditions are favourable to one plant or another.

What do we then need to consider? How must we look at a plant when we desire the cosmic forces not to shoot upward into the blossoming and fruiting process but to remain below? Suppose we want the stem and leaf-formation to be held back in the root. What must we then do? We must put such a plant into a sandy soil, for in silicious soil—*especially with high phosphorus levels*— the cosmic is held back; it is actually “caught.” Take the potato, for example. With the potato this end must be attained. The blossoming process must be kept below. For the potato is a stem and leaf-formation down in the region of the root. The leaf and stem-forming process is held back, retained in the potato itself. The potato is not a root, it is a stem-formation held back. We must therefore bring it into a sandy soil. Otherwise we shall not succeed in having the cosmic force retained in the potato.

This, therefore, is the ABC for our judgment of plant-growth. We must always be able to say, what in the plant is cosmic, and what is terrestrial or earthly. How can we adapt the soil of the earth, by its special consistency, as it were to densify the cosmic *forces* and thereby hold it back more in the root and leaf? Or again, how can we thin it out so that it is drawn upward in a dilute condition, right up into the flowers, *connecting more strongly with the Cosmic Substance process*, giving them colour — or into the fruit-forming process, permeating the fruit with a fine and delicate taste? For if you have apricots or plums with a fine taste — this taste, just like the colour of the flowers, is the cosmic *force* quality which has been carried upward, right into the fruit. In the apple you are eating Jupiter, in the plum you are actually eating Saturn.

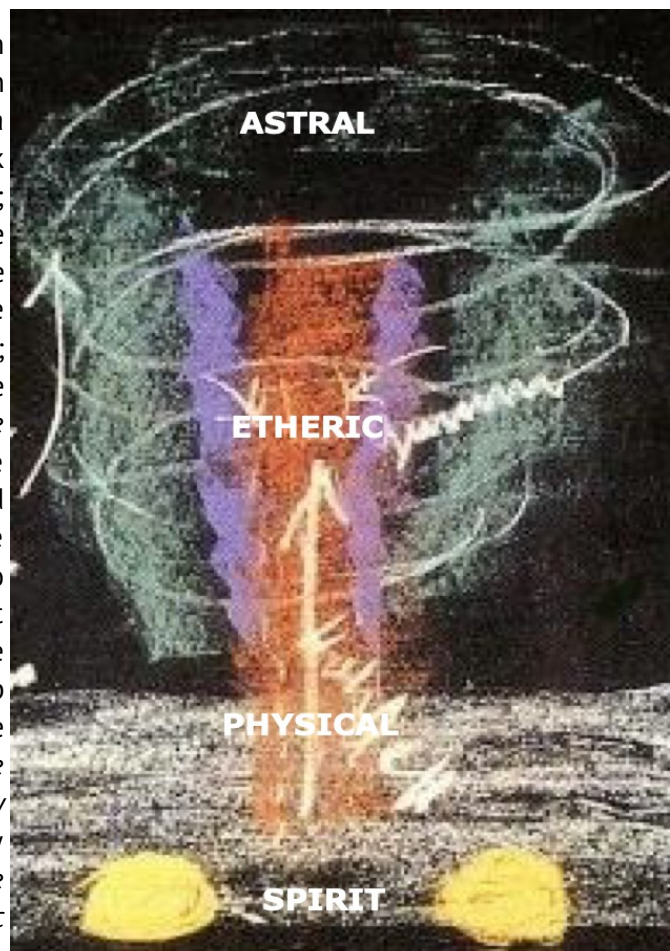
If mankind with their present state of knowledge were suddenly obliged to create, from the comparatively few plants of the primeval epoch of the Earth, the manifold variety of our present fruits and fruit-trees, they would not get very far. We should not get far if it were not for the fact that the forms of our different fruits are inherited. They were produced at a time when humanity had knowledge, out of primeval and instinctive wisdom, how to create the different kinds of fruits from the primitive varieties that then existed. If we did not already possess the different kinds of fruit, handing them down by heredity —if we had to do it all over again with our present cleverness — we should not be very successful in creating the different kinds of fruit. Nowadays it is all done by blind experiment, there is no rational penetration into the process.

As I said just now, the man of to-day may know — though this knowledge too is very scanty — he may know how the air behaves in the interior of the Earth. But he knows practically nothing of how

the light behaves in the interior of the Earth. He does not know that the silicious – that is, the cosmic *carrier* – stone or rock or sand receives the light into the Earth and makes it effective there. Whereas that which stands nearer to the earthly-living nature, namely the humus, does not receive it; it does not make the light effective in the Earth. It therefore gives rise to a “light-less” working. Such things must be penetrated once more with clear understanding. (3)

But the stem, formed from *the Wood sap, which is a combination of Cosmic forces and Earthly Substances, that have gone through the fructification event*, rises into the air, and the air always contains moisture. It comes into the moist air, it comes with the sap which has created it, from the earthy-fluidic into the fluidic-airy *drenched Earthly Forces* and life springs up in it anew, so that around it green leaves appear and finally flowers. ... Again there is life. You see, in the foliage, in the leaf, in the bud, in the blossom, there is once more the sap of life; the wood-sap is dead life-sap. In the stem, life is always dying; in the leaf it is always being resurrected. So that we must say: We have wood sap, which mounts *from the Earth*; then we have life-sap *from the Etheric and Astral activity of the environment*. And what does this do! It travels all round and brings forth the leaves everywhere: so that you can see the spirals in which the leaves are arranged. The living sap really circles round. It arises from the fluid-airy element into which the plant comes when it has grown out of the earthy-fluidic element.

The stem, the woody stem, is dead and only that which sprouts forth around the plant is alive. This you can easily prove in the following very simple way. Go to a tree: you have the stem, then the bark, and in the bark the leaves grow. Now cut the bark away at that point; the leaves come away too. At this point leave the leaves with the bark. The result is that there the tree remains fresh and living, and here it begins to die. The wood alone with its sap cannot keep the tree alive; what comes with the leaves must come from outside and that again contains *etheric filled life, from the oxygen in the atmosphere*. We see in this way that the earth can certainly put forth the tree, but she would have to let it die if it did not get *etheric* life from the damp air: for in the tree the sap is only a chemical, no giver of life. The living sap that circulates, that gives it life. And one can really say: When the sap rises in the spring, the tree is created anew; when the living sap again circulates in the spring, every year the tree's life is renewed. The earth produces the *Wood sap, with the Spiritualised Cosmic Forces and Physicalised Earthly Substance*, from the earthy-fluidic; the fluidic-airy produces the living sap, *through the action of the Ethericised Earthly Forces and Astralised Cosmic Substance*. (1)



These undine beings differ in their inner nature from the gnomes. They cannot turn like a spiritual sense-organ outwards towards the universe. They can only yield themselves up to the weaving and working of the whole cosmos in the airy-moist element, and therefore they are not beings of such clarity as the gnomes. They dream incessantly, these undines, but their dream is at the same time their own form. They do not hate the earth as intensely as do the gnomes, but they have a sensitivity to what is earthly. They live in the etheric element of water, swimming and swaying through it, and in a very sensitive way they recoil from everything in the nature of a fish; for the fish-form is a threat to them, even if they do assume it from time to time, though only to forsake it immediately in order to take on another metamorphosis. They dream their own existence. And in dreaming their own existence they bind and release, they bind and disperse the substances of the air, *with the help of the*

Earthly Forces, which in a mysterious way they introduce into the leaves, as these are pushed upwards by the gnomes. For at this point the plants would wither if it were not for the undines, who approach from all sides, and show themselves, as they weave around the plants in their dream-like existence, to be what we can only call the world-chemists. The undines dream the uniting and dispersing of substances. And this dream, in which the plant has its existence, into which it grows when, developing upwards, it forsakes the ground, this undine-dream is the world-chemist which brings about in the plant-world the mysterious combining and separation of the substances which emanate from the leaf. We can therefore say that the undines are the chemists of plant-life. They dream of chemistry. They possess an exceptionally delicate spirituality which is really in its element just where *etheric* water and *astral* air come into contact with each other. The undines live entirely in the element of moisture, but they develop their actual inner function when they come to the surface of something watery, be it only to the surface of a water-drop or something else of a watery nature. For their whole endeavour lies in preserving themselves from getting the form of a fish, the permanent form of a fish. They wish to remain in a condition of metamorphosis, in a condition of eternal, endlessly changing transformation. But in this state of transformation in which they dream of the stars and of the sun, of light and of warmth, they become the chemists who now, starting from the leaf, carry the plant further in its *etheric* formation, after it has been pushed upwards by the power of the gnomes. So the plant develops its leaf-growth, and this mystery is now revealed as the dream of the undines, into which the plants grow.

To the same degree, however, in which the plant grows into the dream of the undines, does it now come into another domain, into the domain of those spirits which live in the airy-warmth element, just as the gnomes live in the moist-earthly *substance*, and the undines in the moist-airy *earthly forces* element. Thus it is in the *cosmic substance* element which is of the nature of air and warmth that those beings live which an earlier clairvoyant art designated as the sylphs. Because air is everywhere imbued with *Astral* light, these sylphs, which live in the airy-warmth element, press towards the light, relate themselves to it. They are particularly susceptible to the finer but larger movements within the atmosphere.

When in spring or autumn you see a flock of swallows, which produce as they fly vibrations in a body of air, setting an air-current in motion, then this moving air-current – and this holds good for every bird – is for the sylphs something audible. Cosmic music sounds from it to the sylphs. If, let us say, you are travelling somewhere by ship and the seagulls are flying around it, then in what is set in motion by the seagulls' flight there is a spiritual sounding, a spiritual music which accompanies the ship.

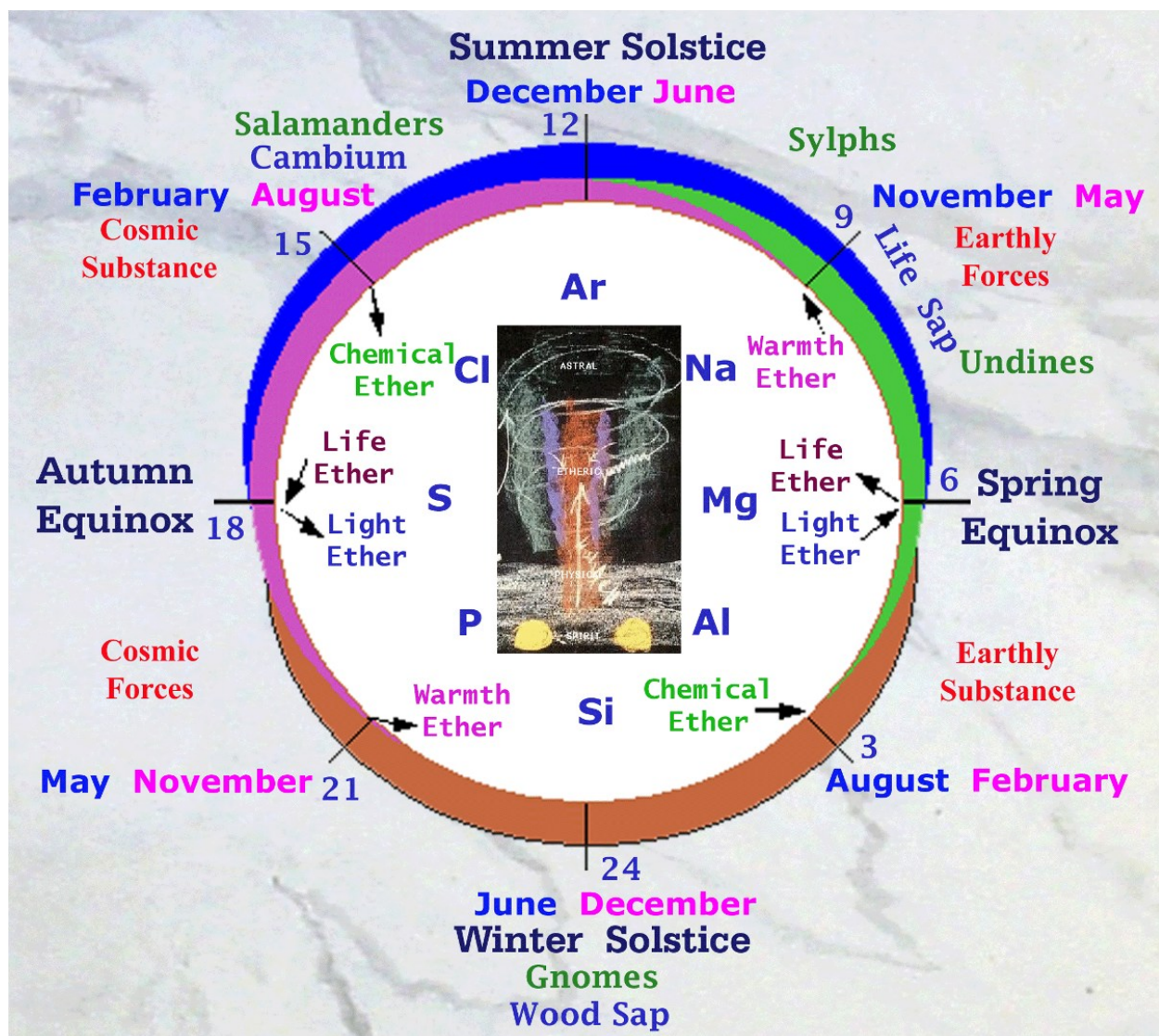
Again it is the sylphs which unfold and develop their being within this sounding music, finding their dwelling-place in the moving current of air. It is in this spiritually sounding, moving element of air that they find themselves at home; and at the same time they absorb what the power of *Astral* light sends into these vibrations of the air. Because of this the sylphs, which experience their existence more or less in a state of sleep, feel most in their element, most at home, where birds are winging through the air. If a sylph is obliged to move and weave through air devoid of birds, it feels as though it had lost itself. But at the sight of a bird in the air something quite special comes over the sylph. I have often had to describe a certain event in man's life, that event which leads the human soul to address itself as "I". And I have always drawn attention to a saying of Jean Paul, that, when for the first time a human being arrives at the conception of his "I", it is as though he looks into the most deeply veiled Holy of Holies of his soul. A sylph does not look into any such veiled Holy of Holies of its own soul, but when it sees a bird an ego-feeling comes over it. It is in what the bird sets in motion as it flies through the air that the sylph feels its ego, or its *internal spirit*. And because this is so, because its ego is kindled in it from outside, the sylph becomes the bearer of cosmic love through the atmosphere. It is because the sylph embodies something like a human wish, but does not have its ego within itself but in the bird-kingdom, that it is at the same time the bearer of wishes of love through the universe.

Thus we behold the deepest sympathy between the sylphs and the bird-world. Whereas the gnome hates the amphibian world, whereas the undine is unpleasantly sensitive to fishes, is unwilling to approach them, tries to avoid them, feels a kind of horror for them, the sylph, on the other hand, is

attracted towards birds, and has a sense of well-being when it can waft towards their plumage the swaying, love-filled waves of the air. And were you to ask a bird from whom it learns to sing, you would hear that its inspirer is the sylph. Sylphs feel a sense of pleasure in the bird's form. They are, however, prevented by the cosmic ordering from becoming birds, for they have another task. Their task is lovingly to convey *Astral* light to the plant. And just as the undine is the *Etheric* chemist for the plant, *stimulating the Earthly Forces*, so is the sylph the *Astral* light-bearer *using the Cosmic Substance process*. The sylph imbues the plant with light; it bears light into the plant.

Through the fact that the sylphs bear light and *Cosmic Substances* into the plant, something quite remarkable is brought about in it. You see, the sylph is continually carrying light into the plant. The *Cosmic Substance* light, that is to say the power of the sylphs in the plant, works upon the chemical forces *working with the Earthly Forces*, which were induced into the plant by the undines. Here occurs the inter-working of sylph-light and undine-chemistry. This is a remarkable plastic activity. With the help of the upstreaming substances, *provided through the combined activity of the Cosmic Forces and Earthly Substances*, which are worked upon by the undines, the sylphs weave out of the light an ideal plant-form. They actually weave the *Ideal Plant* within the plant from *Cosmic Substance* light, *from the Sylphs* and from the chemical *Earthly Force* working of the undines. And when towards autumn the plant withers and everything of physical substance disintegrates, then these 'female' plant-forms begin to seep downwards, and now the gnomes perceive them, perceive what the world – the sun through the sylphs, the air through the undines – has brought to pass in the plant. This the gnomes perceive, so that throughout the entire winter they are engaged in perceiving below what has seeped into the ground through the plants. Down there they grasp world-ideas in the plant-forms which have been plastically developed with the help of the sylphs, and which now in their spiritual *feminine* ideal form enter into the ground.

Naturally those people who regard the plant as something purely material know nothing of this spiritual



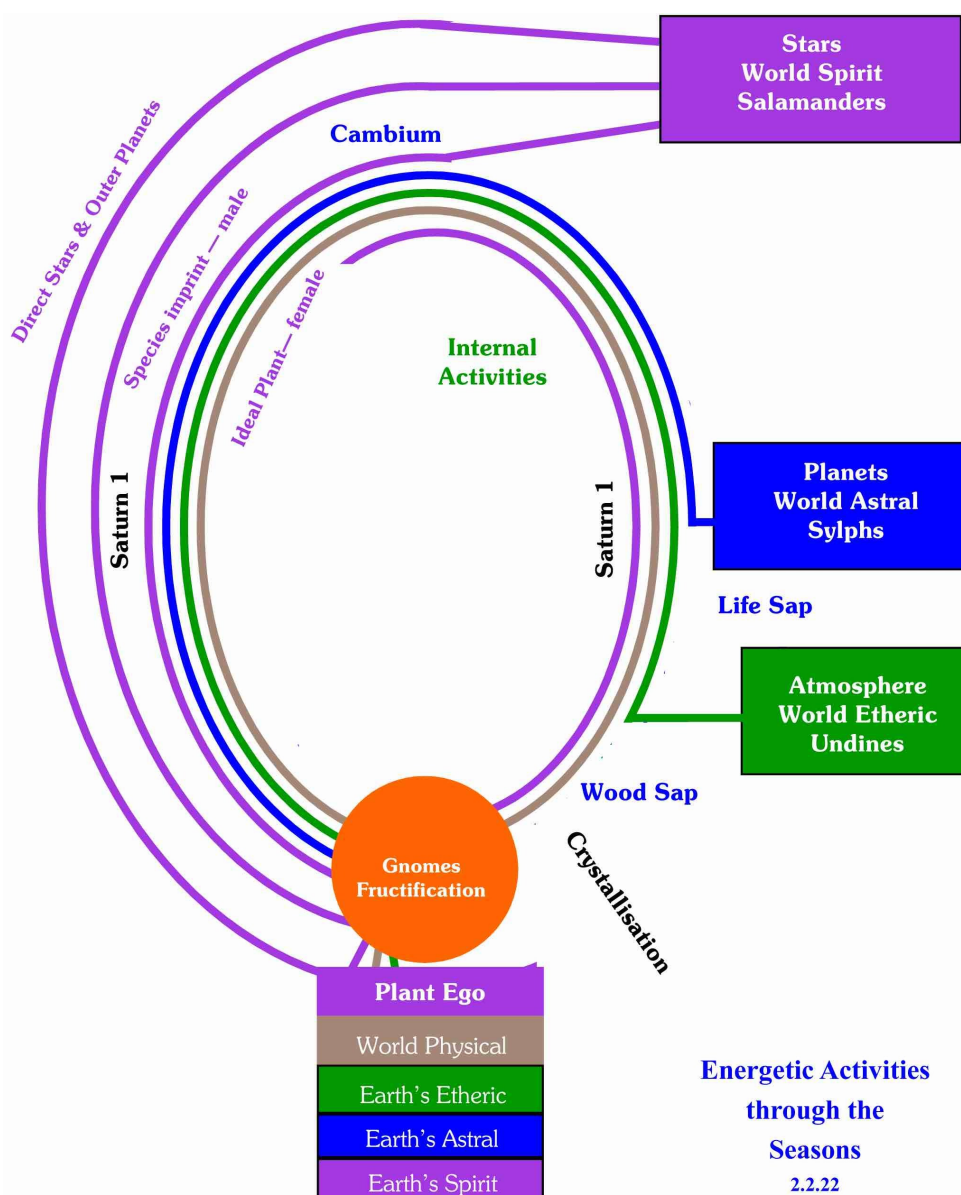
feminine ideal form. Thus at this point something appears which in the materialistic observation of the plant gives rise to what is nothing other than a colossal error, a terrible error. I will sketch this error for you.

Fructification

Everywhere you will find that materialistic science describes matters as follows: The plant takes root in the ground, above the ground it develops its leaves, finally unfolding its blossoms, within the blossoms the stamens, then the seed-bud. Now – usually from another plant – the pollen from the anthers, from the pollen vessels, is carried over to the germ which is then fructified, and through this the seed of the new plant is produced. The germ is regarded as the female element and what comes from the stamens as the male – indeed matters cannot be regarded otherwise as long as people remain fixed in materialism, for then this process really does look like a fructification.

This, however, it is not. In order to gain insight into the process of fructification, that is to say the process of reproduction, in the plant-world, we must be conscious that in the first place it is from what the great chemists, the undines, bring about in the plants, and from what the sylphs bring about, that the *female* plant-form arises, *as the best expression of what that plant can be in that seasons conditions*. This is the *female* ideal plant-form which sinks into the ground and is preserved by the gnomes. It is there below, this plant-form. And there within the earth it is now guarded by the gnomes after they have seen it, after they have looked upon it. The earth becomes the mother-womb for what thus seeps downwards. This is something quite different from what is described by materialistic science.

The Ideal Plant – Cosmic Substance ,Astral stream



After it has passed through the sphere of the sylphs, the plant comes into the sphere of the *Spirit filled* elemental fire-spirits. These fire-spirits are the inhabitants of the warmth-light element. When the warmth of the earth is at its height, or is otherwise suitable, they gather the *Spirits* warmth together, *within the Cosmic Substance* process. Just as the sylphs gather up the light, so do the fire-spirits gather up the warmth and carry it into the blossoms of the plants. (2)

But that is not all. While this is happening, between the bark, still full of living sap, and the woody stem, there is formed a new layer. Now I cannot say that a sap is formed. I have already spoken of wood-sap, living sap, but I cannot again say that a sap is formed: for what is formed is quite solid: it is called cambium. It is formed between the bark which still belongs to the leaves, and the wood. When I cut here (see sketch pg 18) no cambium is

formed. But the plant needs cambium too, in a certain way. You see, the wood sap is formed in the earthy-fluidic, the life sap in the fluidic-airy, and the cambium in the warm air, in the warm damp, or the airy-warmth *of the astralised Cosmic Substance process*. The plant develops warmth while it takes up life from outside, *because of the interaction between the Cosmic Substance and Earthly Forces, which must reach a certain intensity. As indicated by the swirling nature of the image on page 17*. This warmth goes inward and develops the cambium inside. Or if the cambium does not yet develop – the plant needs cambium and you will shortly hear why – before the cambium forms, there is first of all developed a thicker substance: the plant gum. Plants form this plant gum in their inner warmth, and this, under certain conditions, is a powerful means of healing. Thus the *Wood* sap carries the plant upwards, the leaves give the plant *etheric* life, then the leaves by their warmth produce the gum which reacts on the warmth. And in old plants, this gum, running down to the ground, has become transparent. When the earth was less dense and damper, the gum became transparent and turned to Amber. You see, then, when you take up a piece of Amber, what from prehistoric plants ran down to the ground as resin and pitch. This the plant gives back to the earth: Pitch, Resin, Amber. And if the plant retains it, it becomes cambium. Through the *Wood* sap the plant is connected with the earth; the life-sap brings the plant into connection with what circulates round the earth – with the airy-moist circumference of the earth. But *the Cosmic Substance activity* of the cambium brings the plant into connection with the stars, with what is above, and in such a way that within this cambium the *female ideal* form of the next plant develops. This passes over to the seeds and in this way the next plant is born, so that the stars indirectly through *the Cosmic Substance* and the cambium create the next plant! So that the plant is not merely created from the seed – that is to say, naturally it is created from the seed, but the seed must first be worked on by *the Cosmic Substance process* and the cambium, that is: by the whole heavens.

It is really wonderful – a seed, a humble, modest little seed could only come into existence because the cambium – now not in liquid but in solid form – imitates the whole plant; and this form which arises there in the cambium – a new *female* plant form – this carries the *reproductive* power to the seed to develop through the forces of the earth into a new plant.

Through mere speculation, when one simply puts the seed under a microscope, nothing is gained. We must be clear what parts the *wood* sap, the life sap, the cambium, play in the whole matter. The wood sap is a relatively thin sap: it is peculiarly fitted to allow chemical changes to take place in it. The life sap is certainly much thicker, it separates off its gum. If you make the gum rather thick, you can make wonderful figures with it. Thus the life sap, more pliable than the wood sap, clings more to the plant-form. And then it gives this up entirely to the cambium. That is still thicker, indeed quite sticky, but still fluid enough to take the forms which are given it by the stars, *via the Cosmic Substance*.

So it is with trees, and so, too, with the ordinary plants. When the rootlet is in the earth, the sprout shoots upward. But it does not separate off the solid matter, does not make wood; it remains like a cabbage stalk. The leaves come out directly on the circumference, in spirals, the cambium is formed directly in the interior, and the cambium takes everything back to the earth with it. So that in the annual plants the whole process occurs much more quickly. In the tree, only the hard parts are separated out, and not everything is destroyed.

The same process occurs in ordinary plants too, but is not carried so far as in trees. In the tree it is a fairly complicated matter. When you look at the tree from above, you have first the pith inside: this gives the direction. Then layers of wood form round the pith. Towards the autumn the gum appears from the other side, and fastens the layers together. So we have the gummy wood of one year. In the next year this is repeated. Wood forms somewhere else, is again gummed together in the autumn, and so the yearly rings are formed. So you see everything clearly if only you understand that there are three things: wood sap, life sap, and cambium. The wood sap is the most fluid, it is really a chemical; the life sap is the giver of life; it is really, if I may so express myself, a living thing. And as for the cambium, there the whole plant is sketched out *from what the Cosmic Substance receives from the stars*. It is really so. The wood sap rises and dies, then life again arises; and now comes the influence of the stars, so that from the thick, sticky cambium the new '*female*' plant is sketched out. In the

cambium one has a sketch, a sculptural activity. The stars model in it from the whole universe the complete plant form. So you see, we come from Life into the Spirit. What is modelled there is modelled from out of the World-Spirit. The earth first gives up her life to the plant, the plant dies, the air environment along with its light once more gives it life, and the World Spirit implants the new plant form. This is preserved in the seed and grows again in the same way. So that one sees in the growing plant how the plant world rises out of the earth, through death, to the living Spirit.

Wood sap develops in man as the ordinary colourless mucus. Wood sap in plants is, in man, mucus. The life sap of the plant which circulates from the leaves, corresponds to the human blood. And the cambium of the plant corresponds to the milk and the chyle in the human being. When a woman begins to nurse, certain glands in the breast cause a greater flow of milk. Here you have again something in human beings which is most strongly influenced by the stars, namely, *milk*. Milk is absolutely necessary for the development of the brain – the brain, one might almost say, is solidified milk. Decaying leaves create no proper cambium because they no longer have the power to work back into the proper warmth. They let the warmth escape outwards from the dying edges instead of sending it inwards. We eat these plants with an improperly developed cambium: they do not develop a proper milk; the women do not produce proper milk; the children get milk on which the stars cannot work strongly, and therefore they cannot develop properly. (1)

Cosmic Male Seed – Cosmic Forces, Spirit stream

Now for the tilling of the soil one important thing should above all be understood. We must know the conditions under which the cosmic spaces are able to pour their forces down into the earthly realm. To recognise these conditions, let us take our start from the seed-forming process. The seed, out of which the embryo develops, is usually regarded as a very complicated molecular structure, and scientists are especially anxious to understand it in its complex molecular structure. In simple molecules, they imagine, there is a simple structure; then it grows ever more complicated, till at last we get to the infinitely complex structure of the protein molecule.

With wonder and astonishment they stand before what they imagine as the complicated structure of the protein in the seed. For they conceive it as follows. They think the protein molecule must be extremely complicated; for after all, out of its complexity, the whole new organism will grow. The new organism, infinitely complex as it is, was already pre-figured in the embryonic condition of the seed. Therefore this microscopic or ultra-microscopic substance must also be infinitely complex in its structure.

To begin with, to a certain extent this is quite true. When the earthly protein is built up, the molecular structure is indeed raised to the highest complexity. But a new organism could never arise out of this complexity. The organism does not arise out of the seed in that way at all. That which develops as the seed, out of the mother-plant or mother-animal, does not by any means simply continue its existence in that which afterwards arises as the descendant plant or animal. That is not true. The truth is rather this:—

When the complexity of structure has been enhanced to the highest degree, *by the Cosmic Substance*, it all disintegrates again, and eventually, where we first had the highest complexity attained within the Earth-domain, we now have a tiny realm of chaos. It all disintegrates, as we might say, into cosmic dust. Then, when the seed – having been raised to the highest complexity – has fallen asunder into cosmic dust and the tiny realm of chaos is there, then the entire surrounding Universe begins to work and stamps itself upon the seed, thus building up out of the tiny chaos that which can only be built in it by *Cosmic* forces pouring in from the great Universe from all sides. So in the seed *during pollination*, we get an image of the Universe.

In every seed-formation, the earthly processes of organisation is carried to the very end – to the point of chaos. Time and again, in the chaos of the seed the new organism is built up again out of the whole Universe. The parent organism has to play this part: through its affinity to a particular cosmic situation, it tends to bring the seed into that situation whereby the *Cosmic* forces work from the right cosmic directions, so that a dandelion brings forth, not a barberry, but a dandelion in its turn.

That which is imaged in the single plant, is always the image of some cosmic constellation. Ever and again, it is built out of the Cosmos. Therefore, if ever we want to make the *Cosmic* forces effective in our earthly realm, we must drive the earthly as far as possible into a state of chaos. For plant-growth, Nature herself will see to it to some extent, that this is done. However, since every new organism is built out of the Cosmos, it is also necessary for us to preserve the cosmic *force* process, *carried by the primary Saturn stream*, in the organism long enough – that is, until the seed-forming process occurs once more, *if we wish to maintain true species expression*. (3)

Undines carry the action of the chemical ether, *and the Earthly Forces* into the plants, sylphs the action of the light-ether *and Cosmic Substance* into the plant's blossoms. And the pollen now provides what may be called little air-ships, to enable the fire-spirits to carry *the Cosmic Force* warmth into the seed. Everywhere warmth is collected with the help of the stamens, and is carried by means of the pollen from the anthers to the seeds and the seed vessels. And what is formed here in the *Cosmic Force* *drenched* seed-bud is entirely the male element which comes from the cosmos. It is not a case of the seed-vessel being female and the anthers of the stamens being male. In no way does fructification occur in the blossom, but only the pre-forming of the male seed. (2)

The fructifying force is what the fire-spirits in the blossom take from the warmth of the world-all as the cosmic male seed, which is united with the female element. This *female* element, drawn from the forming of the plant has, as I told you, already earlier seeped down into the ground as *the* ideal form *possible from that seasons growth processes*, and is resting there below. For plants the earth is the mother, the heavens the father. And all that takes place outside the domain of the earth is not the mother-womb for the plant. It is a colossal error to believe that the mother-principle of the plant is in the seed-bud. The fact is that this is the male-principle, which *are Cosmic Forces* drawn forth from the universe with the aid of the fire-spirits. The mother comes from the cambium, *via the Cosmic Substance*, which spreads from the bark to the wood, and is carried down from above as ideal form. And what now results from the combined working of gnome-activity and fire-spirit activity – this is fructification. The gnomes are, in fact, the spiritual midwives of plant-reproduction. Fructification takes place below in the earth during the winter, when the *male* seed comes into the earth and meets with the *female* forms which the gnomes have received from the activities of the sylphs and undines and now carry to where these forms can meet with the fructifying seeds.

You see, because people do not recognize what is spiritual, do not know how gnomes, undines, sylphs and fire-spirits – which were formerly called salamanders – weave and live together with plant-growth, there is complete lack of clarity about the process of fructification in the plant world. There, outside the earth nothing of fructification takes place, but the earth is the mother of the plant-world, the heavens the father. This is the case in a quite literal sense. Plant-fructification takes place through the fact that the gnomes take from the fire-spirits, *the Cosmic Forces* the fire-spirits have carried into the seed bud as concentrated cosmic warmth on the little airships of the anther-pollen. Thus the fire-spirits are the bearers of warmth.

Once Again

And now you will easily gain insight into the whole process of plant-growth. First, with the help of *the Cosmic Forces* coming from the fire-spirits, the gnomes down below instill *the Earths Etheric* life into the plant and push it upwards. They are the fosterers of life. They carry the life-ether *and Earthly Substances* to the root – the same life-ether in which they themselves live. The undines foster the chemical ether *and the Earthly Forces*, the sylphs the light-ether *and Cosmic Substance*, the fire-spirits the warmth ether *and Cosmic Forces*. And then the fruit of the warmth-ether *and Cosmic Forces* again unites with what is present below as life *ether and Earthly Substance*. Thus the plants can only be understood when they are considered in connection with all that is circling, weaving and living around them, and one only reaches the right interpretation of the most important process in the plant when one penetrates into these things in a spiritual way.

When once this has been understood, it is interesting to look again at that memorandum of Goethe's where, referring to another botanist, he is so terribly annoyed because people speak of the eternal marriage in the case of the plants above the earth. Goethe is affronted by the idea that marriages

should be taking place over every meadow. This seemed to him something unnatural. In this Goethe had an instinctive but very true feeling. He could not as yet know the real facts of the matter, nevertheless he instinctively felt that fructification should not take place above in the blossom. Only he did not as yet know what goes on down below under the ground, he did not know that the earth is the mother-womb of the plants. But, that the process which takes place above in the blossom is not what all botanists hold it to be, this is something which Goethe instinctively felt.

You are now aware of the inner connection between plant and earth. But there is something else which you must take into account.

You see, when up above the fire-spirits are circling around the plant and transmitting *the archetype Saturn 1 Cosmic Forces* to the anther-pollen, then they have only one feeling, which they have in an enhanced degree, compared to the feeling of the sylphs. The sylphs experience their self, their ego, when they see the birds flying about. The fire-spirits have this experience, but to an intensified degree, in regard to the butterfly-world, and indeed the insect-world as a whole. And it is these fire-spirits which take the utmost delight in following in the tracks of the insects' flight so that they may bring about the distribution of warmth for the seed buds. In order to carry the concentrated *male Cosmic Force* warmth, which must descend into the earth so that it may be united with the *female* ideal form, in order to do this the fire-spirits feel themselves inwardly related to the butterfly-world, and to the insect-creation in general. Everywhere they follow in the tracks of the insects as they buzz from blossom to blossom. And so one really has the feeling, when following the flight of insects, that each of these insects as it buzzes from blossom to blossom, has a quite special aura which cannot be entirely explained from the insect itself. Particularly the luminous, wonderfully radiant, shimmering, aura of bees, as they buzz from blossom to blossom, is unusually difficult to explain. And why? It is because the bee is everywhere accompanied by a fire-spirit which feels so closely related to it that, for spiritual vision, the bee is surrounded by an aura which is actually a fire-spirit. When a bee flies through the air from plant to plant, from tree to tree, it flies with an aura which is actually given to it by a fire-spirit. The fire-spirit does not only gain a feeling of its ego in the presence of the insect, but it wishes to be completely united with the insect.

Through this, however, insects also obtain that power about which I have spoken to you, and which shows itself in a shimmering forth of light into the cosmos. They obtain the power completely to spiritualize the physical matter which unites itself with them, and to allow the spiritualized physical substance to ray out into cosmic space. But just as with a flame it is the warmth in the first place which causes the light to shine, so, above the surface of the earth, when the insects shimmer forth into cosmic space, it is the fire spirits which inspire the insects to this activity, the fire-spirits which are circling and weaving around them. But if the fire-spirits are active in promoting the outstreaming of spiritualized matter into the cosmos, they are no less actively engaged in seeing to it that the concentrated fiery element, the concentrated warmth, goes into the interior of the earth, *as Cosmic Forces* so that, with the help of the gnomes, the spirit-form, which sylphs and undines cause to seep down into the earth, may be awakened *through Fructification, to form the Wood Sap.* (2)

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Editors Note

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