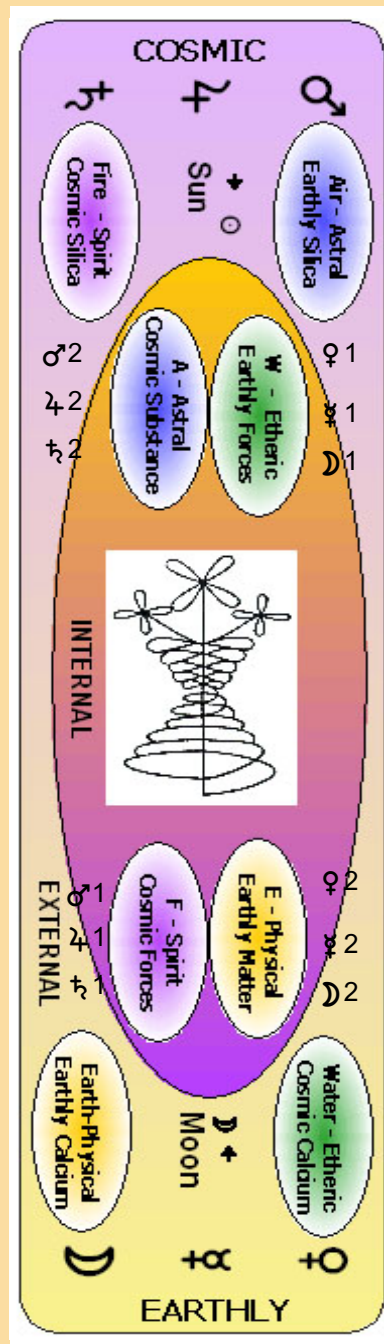


The Physical Formative Forces

Dr Rudolf Steiner

edited by Glen Atkinson



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Foreword

The question of the **Physical Formative Forces (PFF)** is significant as it takes up a good deal of the discussion, in the Agriculture Course. It is the Earthly and Cosmic processes that appear throughout, in relationship to Calcium and Silica. The Earthly and Cosmic activities are often seen as a twofold process of expansion and contraction. How many people take the next step, to see how each of the Cosmic and Earthly processes has two sides to their story, thus making it a fourfold tale?

This fourfold story is told most clearly in the 8th lecture of the Agriculture Course, however it starts in lecture 1 and becomes 4 fold in the 2nd lecture. Another important step occurs in the 6th lecture. If the PFF story is seen in 2nd lecture, then the subsequent lectures take on a very different interpretation, to what we commonly find. The biggest highlight is we are given 4 more preparations with which to influence nature.

As we see in the 2nd lecture RS places this overall story within the context of the 3 fold physical body, organised into a nerve sense system, a rhythmic system and a metabolic system, and then within each of these we have cosmic and earthly processes occurring.

While this story is in the Agriculture course I have found other lectures where RS enlarged on these images. He appears to have spoken of the activities many times. My goal is to present Dr Steiner in his own words, with *my editing, in italics* helping the story to make sense, by using a coherent language throughout. My edits are most often naming the force being described in the Cosmic and Earthly language.

Most of the diagrams I provide, are orientated towards the northern hemisphere Zenith and are thus best viewed facing **South**. There are also some diagrams here orientated to the Earth's **North** magnetic pole. Nature is very magnetic.

This collage is part of a series 'Dr Steiner's Plant Growth Story', done to celebrate the 100 year anniversary of Dr Steiner giving the Agriculture Course, in June 1924.

Glen Atkinson

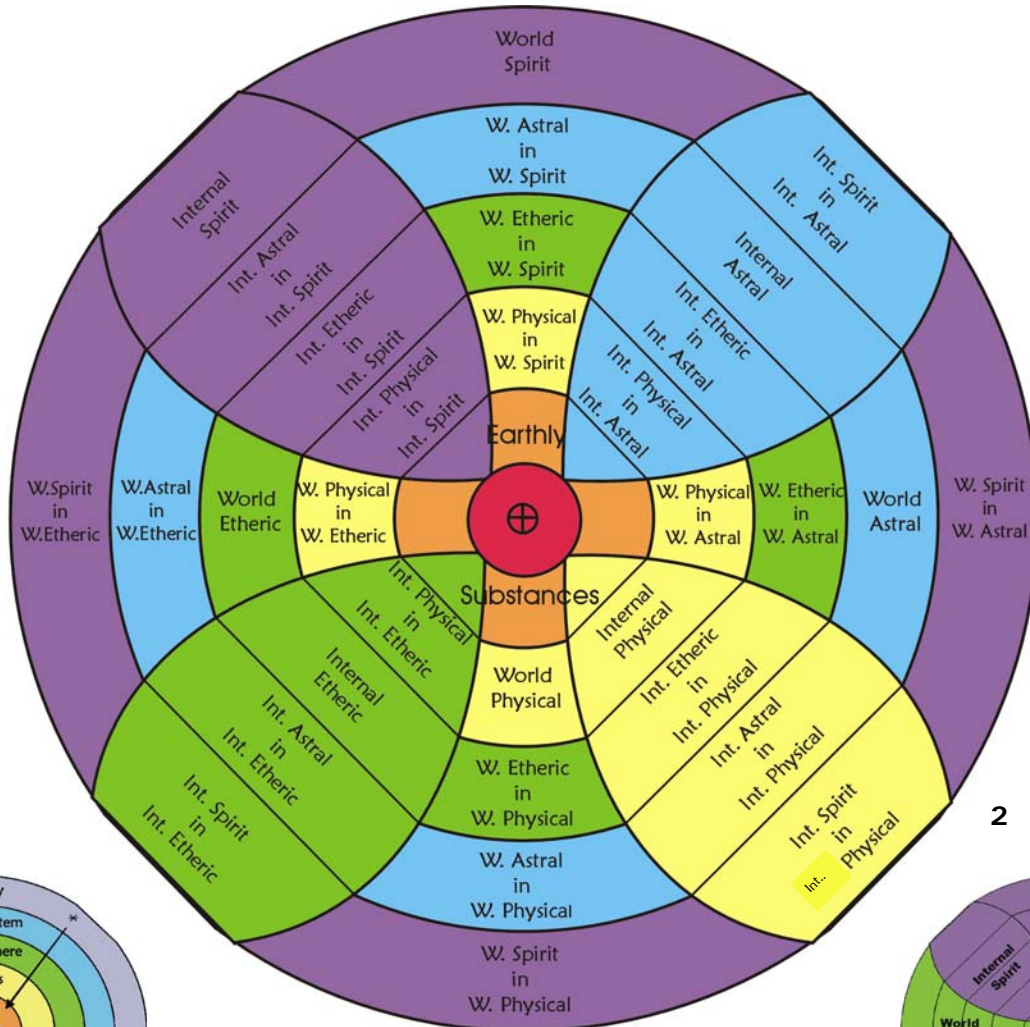
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SPIRIT Galaxy	♋ ♌ ♍ ♎ ♏ ♐	
	♏ ♐ ♑ ♒ ♓ ♈	<i>Spiritlands</i>
	♁ ♂ ♆	<i>Collective Conscious</i>
	♁ ♃ ♆	<i>Collective Unconscious</i>
Solar System ASTRAL	♃ ♄ ♀	<i>Outer planets Personal Conscious</i>
	♁ ♃ ♆	<i>Inner planets Personal Unconscious</i>
ETHERIC Atmosphere	Warmth, Light, Chemical, Life	<i>Ionosphere Ethers</i>
	Fire, Air, Water, Earth	<i>Stratosphere Elements</i>
	Hydrogen, Nitrogen, Oxygen, Carbon	<i>Troposphere</i>
	CHO, Sugars, Proteins, 'Life'	<i>Biosphere</i>
PHYSICAL Earth	Mg, Na, K, Al, Mo, Fe, Cu, Ag, Au, Pb	<i>Chemicals</i>
	Ca, Si	<i>Solid Earth</i>

The layers of Creation

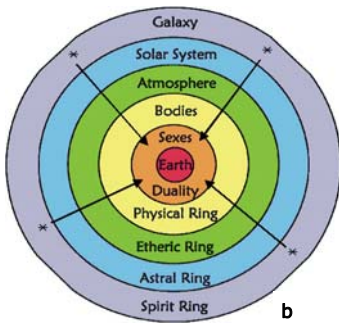
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| ♀ Mars | ♁ Persephone | ♌ Cancer | ♑ Capricorn |
| ♃ Jupiter | ♁ Vulcan | ♌ Leo | ♒ Aquarius |
| ♆ Saturn | ♁ Sun | ♍ Virgo | ♓ Pisces |



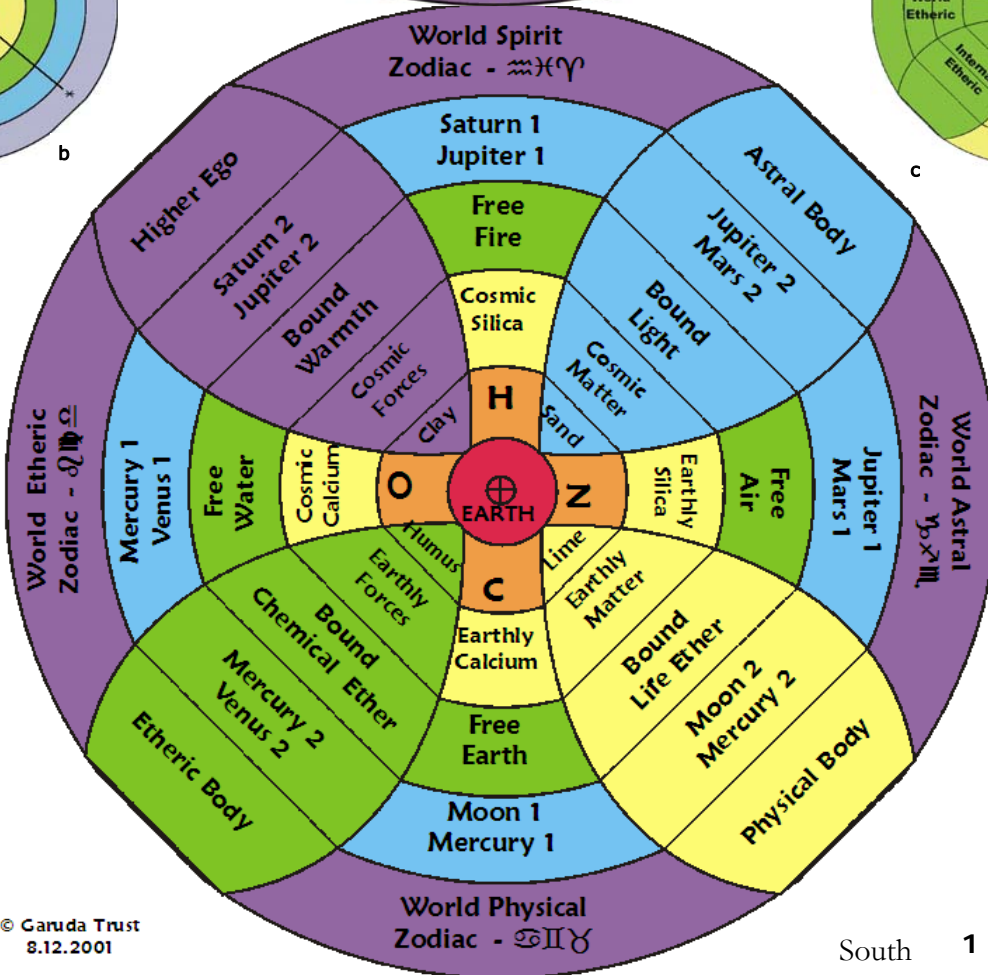
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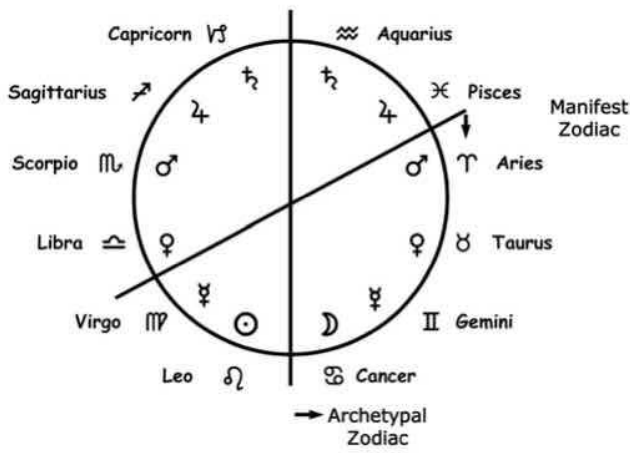


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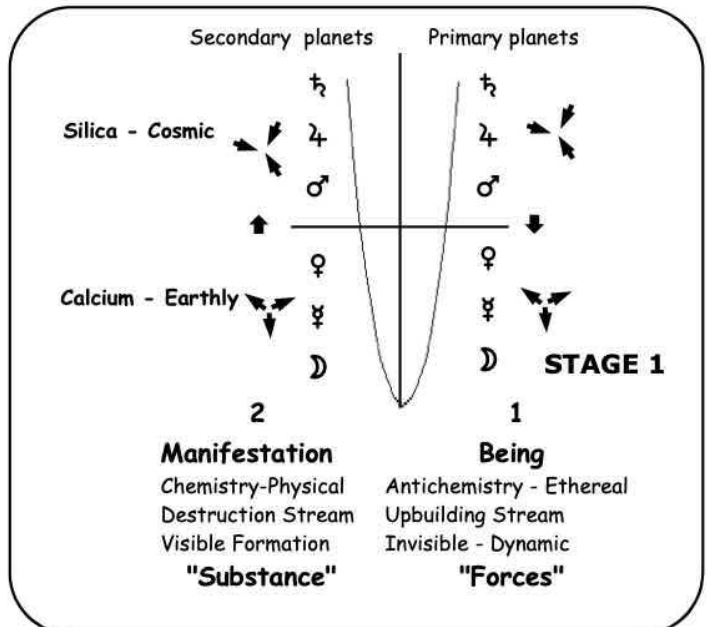
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South 1



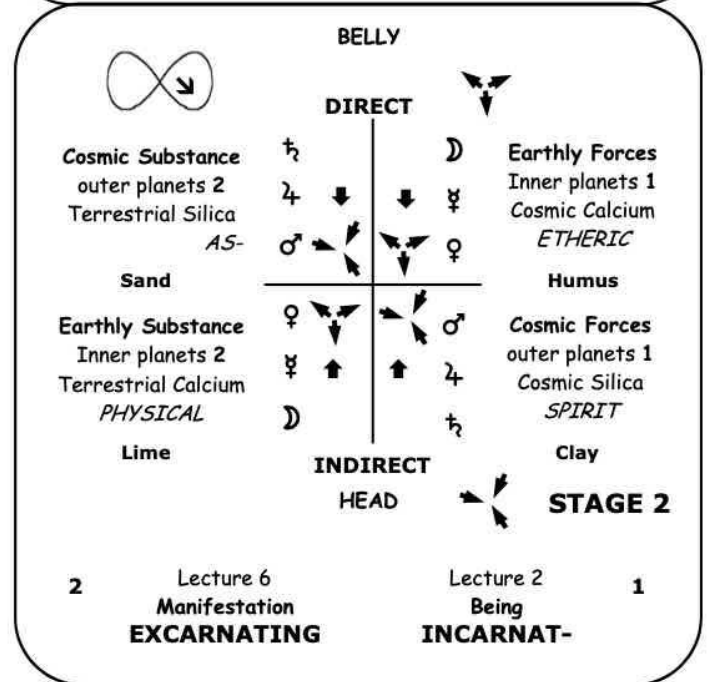
B. Lievegoed

Spirit World



**Steiners
Agriculture
Course**

Soul World



- ♁ Moon
- ♃ Mercury
- ♀ Venus
- ♂ Mars
- ♃ Jupiter
- ♃ Saturn
- ♃ Uranus
- ♃ Neptune
- ♃ Pluto
- ♃ Persephone
- ♃ Vulcan
- ♁ Sun

**When we spin
through the Seasons
in the Saps and Ethers**

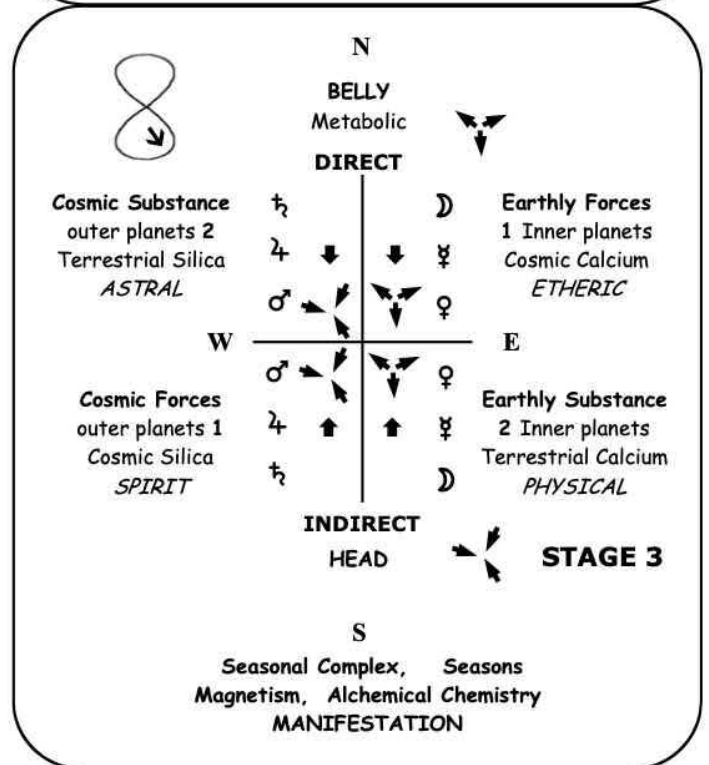
Form World

**The Three Worlds (8)
The Planets and
Steiner's Nature Stories**

Glen Atkinson

9.1.21

North



The 3 fold Physical Body & 4 Physical Activities

On the one hand we have to do with a threefold nature of the *Astral bodies* soul being: in forming mental images, in feeling, and in will impulses. This threefold nature of the soul being, however, corresponds very precisely with a threefolding of the physical-bodily being: a kind of head system or nerve-sense system, a rhythmic system, and a metabolic-limb system. I must stress particularly that this constitution of the human organism must not be understood merely intellectually but through inner perception. A person would be unable to comprehend how matters actually stood if he remained with an external picture, if he understood the head system as something that simply ends at the neck, the circulatory or rhythmic system as being encompassed by the trunk, while the digestive system encompasses the limb system, the sexual system.

What is important here is that while the nerve-sense system is located primarily in the head, it nevertheless extends over the entire remaining organism as such. We may thus say that when we speak here with an anthroposophical purpose about the nerve-sense system, it is the system of functions in the human organism (for we are concerned here not with spatial limitations but functional limitations) that is located essentially in the head; nevertheless the head activity extends over the entire human being so that in a certain sense the whole human being is head. The same is true for the other systems. It was thus mere foolishness when a superficial professor of medicine, who did not intend really to study these matters but only wished to discredit them to the world, spoke about the 'belly-system' in order to ridicule what is actually referred to by the metabolic system. He has merely shown his total lack of understanding for how the threefold constitution of the human being is functional, and not defined by spatial limitations.

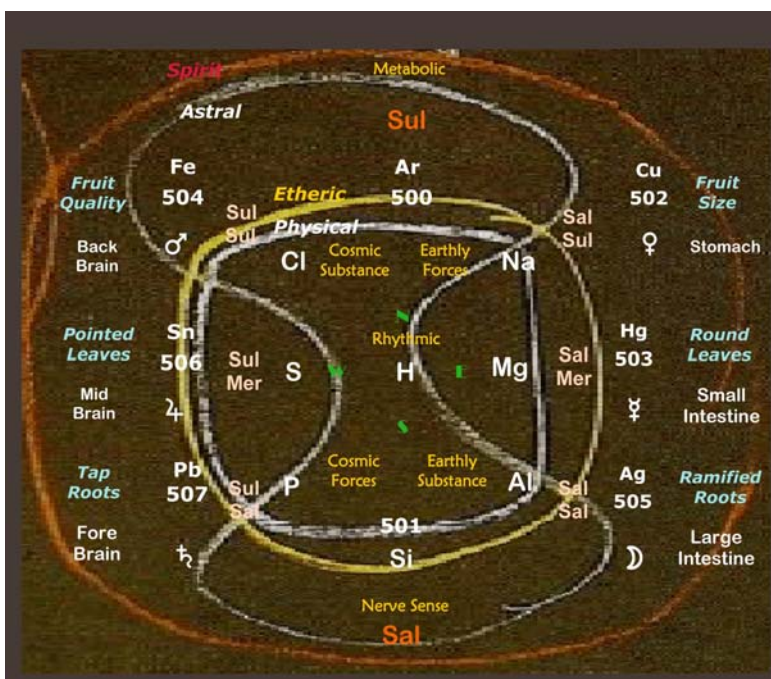
When an individual really understands this constitution of the human being — about which many lectures could be given to describe it in full detail — he reaches the point of being able to perceive clearly the distinctions between the head system, and therefore the nerve-sense system, on the one hand, the metabolic-limb system on the other hand, and the mediating system, the rhythmic system, whose essential role is to bring about the balance between the two other systems.

If we thus wish to encompass the entire nature of the human being, we must consider the following. The actual conceptual and perceptual activity of the human being has as its basis — one cannot even say as its tool, but as its physical basis — everything that takes place physically in the nerve-sense system. It is not the case, as is suggested by modern psychology and physiology, that those processes connected primarily with the feeling and willing systems also take place in the nerve-sense system. Such an opinion does not hold up before a more precise study of the issue. You will find such a precise study, at least suggested in its outlines, in my book, *Riddles of the Soul*.

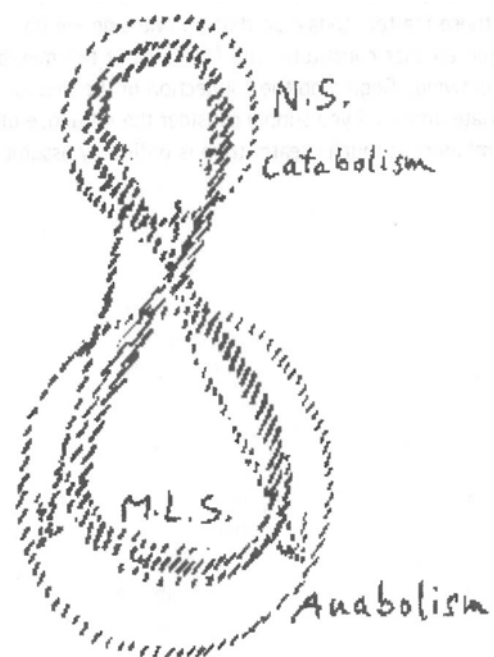
Much detailed work must still be done in this regard, however. Then what spiritual science has to say with certainty from its side will be elaborated from the other side, from the physical-empirical side. It will become clear that man's feeling is not connected in a primary way with the nerve-sense system but with the rhythmic system, that just as the nerve-sense system corresponds to mentally active perception, so the rhythmic system corresponds to feeling. Only through the interaction of the rhythmic system with the nerve-sense system, by the roundabout route of the rhythm in the cerebral fluid, pulsating against the nerve-sense system, is the nerve-sense system engaged as the carrier of the conceptual life. Then, if we raise our feelings to mental images, the dull, dreamlike life of feelings is perceived and pictured by us in an inner way. Just as the life of feeling is directly connected with the rhythmic system and is indirectly mediated by it, so the life of will is connected directly with the metabolic system. This connection in turn acts in a secondary way, since metabolism takes place also in the brain, of course, so that the metabolic system in its functions presses against the nerve-sense system. In this way we are able to bring forth the mental images of our will impulses, which otherwise would unfold in a dull sleep-life within our organism.

Thus you can see that in the human organism we have three different systems that carry the *Astral bodies'* soul life in different ways. These systems do not simply differ from one another; they actually oppose each other (as I said, I can only sketch these matters today) so that on one side we have the nerve-sense system and on the other side all that constitutes the functions of the metabolic system, the metabolic-limb system (see drawing). Regarding the connection of the metabolism with the limbs, you can arrive at appropriate images if you simply consider the influence of the moving limbs on the metabolism. This influence is much greater than is ordinarily assumed in outer consciousness.

These two systems, however, the nerve-sense system and the metabolic-limb system, are in opposition, are polar opposites in a certain way. This polar opposition must be studied carefully



Earth and Plants North



Humans

in order to arrive at a sound pathology and therapy, particularly a pathology that could lead organically over into therapy; it must be studied carefully in all its countless individual details. If one enters into the detailed effects, it becomes evident that what I suggested yesterday is truly the case.

Within everything connected with the head system or nerve-sense system, we have breakdown processes, so that while our conceptual activity takes place in the waking state, when we perceive and form mental images, this activity is not bound up with growth and upbuilding processes but with breakdown processes, processes of elimination. This can be grasped if one looks in a sound way at what empirical-physiological science has already presented concerning this. There is already empirical evidence or to express it better, empirical corroboration — for what spiritual science provides through its perception. You need only pursue what certain inspired physiologists are able to present about the physical processes in the nervous system, which unfold as parallel phenomena to perceiving and forming mental images. You will see then that this assertion is certainly well supported, the assertion that when we think, when we think and perceive wakefully, we have to do with processes of elimination and breakdown, not with upbuilding processes. By contrast, where the will processes are mediated for the human being in the metabolic-limb system we are concerned with upbuilding processes.

All individual functions in the human being definitely interact with one another, however. If we look at the matter correctly, we must say that the upbuilding processes from below work up into the breakdown processes, and that the breakdown processes from above work down into the upbuilding processes. Then if you pursue this logically you have the rhythmic processes as a balancing system, as functions introducing the balance between the upbuilding processes and the breakdown processes, rhythmic processes that press breakdown into build-up and build-up into breakdown.

If we do not study the matter purely outwardly, we see that in the so-called blood circulation of the heart, in the aeration of the human body, we have everywhere special processes, as it were, that are somehow interrupted. I cannot go further now into this interruption, which has its purpose, but everywhere we have a specialization of this rhythmic curve that I have sketched here (see drawing). The course of breathing is a special aspect of this curve, the process that you draw if you follow the course of the blood from the heart upward toward the head or respectively toward the lungs and down to the rest of the body. Thus you have a specialization of these processes. In short, if you enliven what is suggested here, you penetrate into the functional tissue of the human organism, not in the dead way that is customary but in a living way. To do so you must enliven your own mental images. A mobile image of the human organism can thus be pictured. The human organism cannot be encompassed with static, abstract mental images, as modern physiology and pathology would like to encompass it today; it must instead be grasped with mental images in movement, with mental images that can really penetrate into the working of something that has inner movement, that is in no way merely a mechanical interaction of organs situated at rest in relation to one another.

We thus can see that within the human organism there is basically a continuous interaction between the breakdown processes, the deadening processes, and the upbuilding processes, the growth or proliferative processes. The human organization cannot be grasped without this activity.

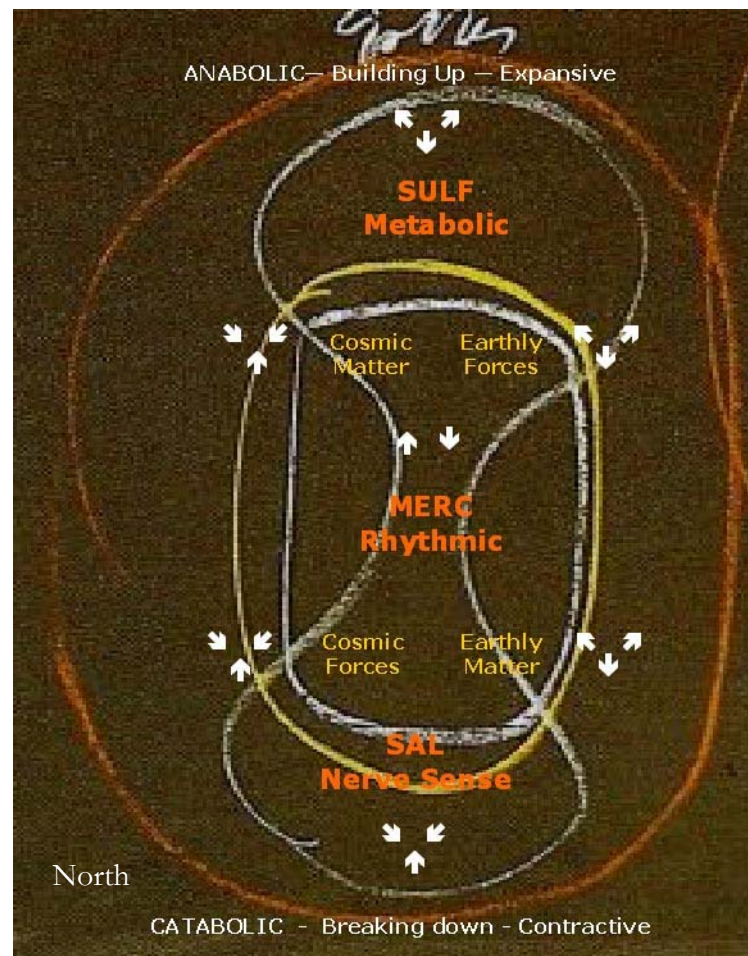
What is actually present there, however? Let's look at the matter more precisely. If the breakdown process of the nerve-sense organization works into the metabolic-limb system through rhythm, something is present there that works against the metabolic-limb system, something that is a poison for this metabolic-limb system. The reverse is also the case, that what is present in the upbuilding system, working into the head system in rhythm, is a poison for the head system. And since, as I have indicated, the systems are spread out over the entire organism, a poisoning and unpoisoning are continuously taking place everywhere in the human organism, and this is brought into balance by the rhythmic processes.

We are therefore unable to regard such a natural process as taking its course one-sidedly, in the way that one normally pictures things, so that healthy processes are simply designated as normal. Rather we look into two processes working against one another, where one is a process that is thoroughly illness-engendering for the other. We simply cannot live in the physical organism at all without continuously exposing our metabolic-limb system to the causes of illness from the head system and exposing the head system to the causes of illness from the metabolic system. A scale that is not balanced properly is thrown out of balance by entirely natural laws so that the beam does not rest on the horizontal; similarly life, because it is in constant movement within itself, does not simply exist in a state of balanced rest but rather exists in a state of balance that can deviate in both directions toward irregularities.

Healing, then, means simply that if the head system, for example, is working in a way too strongly poisonous on the metabolic system, its poisoning effect is relieved, its poisonous effect is taken away. If, on the other hand, the metabolic-limb system is working in a way too strongly poisonous on the head system, which means working over abundantly: then its poisonous effect must also be removed.

It is possible to arrive at a comprehensive view of this realm, however, only if one now extends what can be observed in the human being to the observation of all nature, if one is able to grasp all nature in a spiritual scientific sense. If you look at the plant-forming process, for example, you can see clearly and macroscopically the upward striving of plant-forming processes, a striving away from the center of the earth. You may make a stimulating study of this metamorphosing formative striving of the plants, at least in a rudimentary way, on the basis of the guidelines offered in Goethe's *Metamorphosis of the Plants*. In Goethe's *Metamorphosis of the Plants* there is a sketchy rendering of the first composition, the first elements that are to be studied about the nature of the plant in this direction, but the direction of such a study must be developed further. The initial guidelines must be pursued, for then we may obtain a living view of everything involved in plant growth: when rooting in the soil the plant's *Cosmic Forces* upward-striving develops in a negative direction in the root; the plant begins to grow, then

grows upward with the *Cosmic Forces*, overcoming the force of attraction of the *Earthly Substance* prevailing in the root; then it wrestles through the *Earthly Forces* in order to come ultimately to the *Cosmic Substance's* blossom, fruit, and seed formation. A great deal takes place upon this path.



On this path, for example, an opposing force once again intervenes. The opposing force that intervenes can be well observed if you study, simply to take an example, the common birch, *betula alba*. Pursue very precisely the process that takes place from the root formation through the trunk formation, particularly the bark formation. Consider how, on the basis of everything that works together in the trunk and bark formation, there develops what later comes into manifestation in the leaf formation. This can be studied particularly well in a spiritual scientific way if the still-brownish young birch leaves are studied in the spring.

If this is studied vividly, one also receives a view of forces self-metamorphosing, forces that are active there within the plant. One receives a view of how, on the one hand, there is a formative *Cosmic* force active in the process of plant formation that works from below upward. On the other hand it is also possible to behold the *Earthly Substance* that retards, which in the root still, works strongly as the force of gravity but which, as the plant wrestles itself free from the earthly substance, out into the air is able to work together in another way with the *Cosmic Force* upward-striving force. We then reach an interesting stage, a stage very helpful in understanding how in

plant formation during this upward-striving process certain salts, potassium salts, are deposited in the birch bark; this is simply the result of the interaction of the *Cosmic Substance* working downward with the *Cosmic* forces working upward, tending toward protein-formation, you could say, toward what I would like to designate as the albuminizing force formation.

In this way it is possible to penetrate into the plant-forming process. I can only indicate this here. By looking at how the potassium salts are deposited in the birch bark, how something wrestles itself free from this *Cosmic Substance*, drawing downward (a process somewhat comparable to what happens when a salt precipitates out of a solution), coming to the process that takes place when the solution rids itself of the salt, we come to see, to grasp in a living way, the process of protein formation, the process I would designate as the albuminizing process. We thus have a path to study what outwardly surrounds the human being, to study it vividly.

Then when we look back at the human being, we can see how, fundamentally speaking, the human being has the same form of forces in him — if we consider the *Cosmic Force* breakdown process working from above downward — that work from below upward in the plant. We can see that in what is active in the *Cosmic* forces working downward from the head system toward the metabolic-limb system there is something like an inverted plant element active within us. We can see that in fact those *Cosmic* forces that we see sent upward in plant growth work in a downward direction in the human being. If the human being inappropriately holds back this *Cosmic Force* process of plant formation active within him, so that he doesn't permeate the bodily life in the right way with *the Cosmic Forces active in the head — the astral, the ego-being* — and if this then penetrates the bodily nature, this penetration expressing itself within the body, then *the Spirit* is held up there, something that should proceed into the human organism. We thus have to do with a pathological phenomenon like that which confronts us, for example, in cases of rheumatism or gouty conditions. If we study what is brought about in the human organism when this breakdown process is dammed up in a certain way, we discover its effects in the process of rheumatism, in the process of gout-formation, and so on.

Let us now shift our gaze again from within the organism to a process of plant formation like the one we have in the *betula alba*. From this we can arrive at the following. We look on the one hand into what takes place in salt formation and on the other hand into protein formation. We find, if we understand this process of protein formation in the right way, that the opposite process is within it and is held up there. We find held up in the organism that process which should take place in a way similar to the correct process of albuminizing in the leaves of the birch. We are thus able to come to the relationship between those processes that take place in the birch leaves, for example, and the processes within the organism if we process what is in the birch leaves into remedies. We can then give these remedies to the human being, by means of which we can bring about a healing, because the remedy correctly opposes this damming-up process that occurs in rheumatism and gout. *The Spirit is drawn into the metabolism, providing direction to the astral activity there.* In this way we look both at what is taking place outside in nature and at what takes place within the organism, and then we arrive at an idea of how we should guide the healing forces.

On the other hand we can see instances when the *Cosmic Force* breakdown processes proceed in such a way that the organism cannot restrain them, so that they pour themselves downward, and the rhythmic system does not press them back in the right way; they thus reach the periphery of the body pressing outward, as it were, toward the skin. Then we get inflammatory conditions on the outer portion of the human being, we get skin eruptions and the like. If we now look back again to our plant, to the *betula alba*, we find the opposing process in the disposition of the potassium salts in the birch bark: we thus become able to see how we can fight against the process of skin eruption, which is an excessive function of exudation within the human being, by preparing a remedy from the birch bark.

We are therefore able to study how plant processes, how mineral processes, are active, and we grasp the connections between what is outside in nature and what is active within the human being. In other words, medical empiricism, therapeutic empiricism, ascends to what Goethe calls in his sense — not now in the intellectual sense but in his sense the rational stage of science. We arrive at a science as therapy, which is able really to penetrate into the connections.

These things are not so simple, for one must study things in detail, at least in accordance with certain types, at first in accordance with secret types of the human personality and in accordance with secrets of natural existence. It should not be assumed that if the process has been studied in an example such as the *betula alba*, an overview has already been reached of what needs to be considered. In each different plant-forming process — for example in the horse chestnut or whatever — these formative processes will manifest themselves in an essentially different way. What has been indicated here should not in any way lead to a generalized twaddle but to a very serious and extensive study. (7)

Cosmic and Earthly

In the immediate vicinity of the earth, we have the Moon and the other planets. The old instinctive science which reckoned the Sun, as one of the planets had one of the following sequence Moon, Mercury, Venus, Sun, Mars, Jupiter, Saturn. Now without going any further into the astronomical aspect of the subject, *other than to say this order is based upon the length of the cycle of the planet*, I wish to point to the relation which exists between planetary life and life on the earth. If we consider life on the earth in general the first thing we have to take into account is the very important part played by the what I might call the life of the silicious substance in the world. You will find this silicious substance in the very beautiful mineral quartz enclosed in prismatic and pyramidal forms. Quartz is silicious substance combined with oxygen; remove the oxygen mentally, and you have the so called silicon. This silicon is regarded by modern chemistry as one of the elements (oxygen, etc.) and when united with oxygen may be regarded as a chemical substance. But we must not forget that this silicon which lives in the mineral quartz makes up from 47% to 48% of the crust of the Earth, i.e. a higher percentage than that of any other substance on earth, oxygen, for example, amounting only to 27% to 28%. Now

silicon, in the form in which it appears in such stony substances as quartz, does not at first seem to possess very much importance if we consider only the material of the soil of earth with its plant growth. Quartz is not soluble in water - the water trickles through it. It thus seems to have no connection with the ordinary commonplace view of "conditions of life". But if you take the Equisetum (horsetail) you will find that it consists of 90% of silicon (the same substance of which quartz consists) in very fine distribution through its form. This shows the enormous importance which this substance, silicon must have. It forms nearly one half of everything on the earth, And yet so completely has its importance been overlooked that its use has been neglected even where it can have the most beneficent results. Silicon forms an essential constituent of many remedies used in Anthroposophical therapy. A whole series of diseases are treated either internally or by baths with this substance, the reason being that what appears in the form of abnormal conditions of the sense organs, (it only appears there, it does not really lie there) the internal sense organs, as a cause of pain is strangely accessible to the influence of silicon. And in general silicon plays the greatest conceivable part in what has been called by the old-fashioned name of the "household of Nature". For it is present not only in quartz and other stones, but in a highly refined state in the atmosphere. Indeed it is present everywhere. One half of the earth at our disposal consists of silicon, what then is the function of this substance?

To answer this question let us assume that our earth contained only half of the quantity of silicon which it actually does possess — *giving a Calcium dominant environment*. We should then have plants in more or less pyramidal form: the blooms would be atrophied and indeed all plants would assume generally the shape of the cacti which strikes us as so abnormal. The cereals would look grotesque; their stems would grow thick and fleshy towards the base, but the ears would be emaciated and without grain.

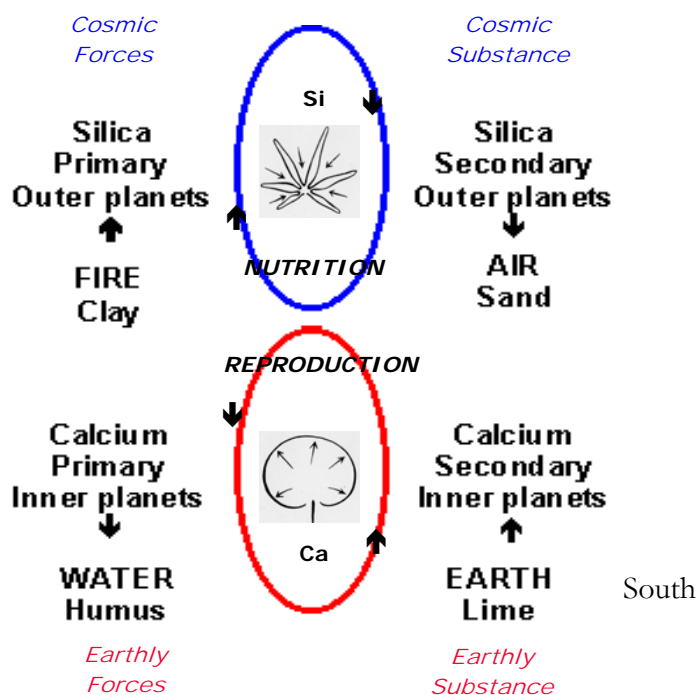
So much for silicon. On the other hand in every part of the earth, although not in such abundance as is silicon, we find lime and their allied substances (limestone, Potash and Sodium). If these were present in small proportions — *and thus have a Silica dominant environment* — we should have plants whose stems were only narrow and twisted we should have only creepers. There would be blooms of course but they would be useless and yield nothing of any food value.

It is only through the balance of these two formative *processes* - as embodied in these two substances, silicon and limestone - that plant life can flourish in the form in which we know it today. *This working together however must be identified in two ways. The first in how the external processes work ONTO life, while the second is when the same processes function WITHIN lifeforms.*

Now, everything silicious contains *Cosmic* forces that come not from the earth but from the so-called distant planets- Mars, Jupiter and Saturn - the planets beyond the Sun. These planets work indirectly upon plant-life through silicon and allied substances. But the planets near the Earth- Moon, Mercury and Venus, send out *Earthly* forces into the plant life and animal life on

earth through the medium of the limestone and kindred substances. Thus of any cultivated field it may be said that the **forces** of both silicon and limestone are at work in it. The silicon mediates the *Cosmic Force* influences of Mars, Jupiter and Saturn, *from below* and the limestone those *Earthly Forces* of Moon, Venus and Mercury, *from above*.

Now let us turn to the plants themselves. There are two things to notice about all plants. The first is that the plant world as a whole and every single species have the power to perpetuate their kind and develop the force of reproduction, etc. The second is that the plant as a member of a relatively low order of nature serves as nourishment for members of higher orders. These two fundamental tendencies seem at first to have little to do with one another. For if we only look at the passing on of the step from parent plant to offspring and so on, it is a matter of indifference to the formative forces of Nature whether or not the plant is used for food. The two interests (i.e. of nature and Man) are completely different, and yet the forces of Nature act in such a



way that the inherent powers of reproduction and growth and of producing generation after generation of plants, are active in the influences exercised upon earth by the Moon, Venus and Mercury, through the mediation of limestone. If we consider plants which are not used for food, which do nothing but reproduce themselves, we take *special* interest in the forces of Venus, Mercury and Moon, related to reproduction. But in the case of plants which are eminently suitable for food, because their substances have become perfected to the point of forming foodstuffs, for human and animal consumption, it is the planets Mars, Jupiter and Saturn that are working through the medium of silicon. Silicon opens up the being of plant to the expanses of the Universe, it awakens the plant's senses, so that it absorbs the formative forces bestowed by the distant planets, Mars, Jupiter and Saturn. From the sphere of Moon, Venus and Mercury on the other hand, the plant absorbs only that which makes it capable of reproducing itself. Now this seems at first to be just an interesting theory. But every insight taken from a wider horizon leads us quite naturally from theory to practice.

For instance in what way can the activities of Moon or Saturn be modified in their influence on plants? If we observe the course of the year, we shall find that on some days there is rain and on others none. All that the modern physicist observes is the fact that on rainy days more water falls on the Earth than on dry days! Water moreover is to him something abstract consisting of oxygen, hydrogen, and nothing more. If water is decomposed by electrolysis it is split into two

substances, each of which acts in its own way. But this tells us nothing about water. There is much more hidden in water than appears in the chemical properties of hydrogen and oxygen. Water by its very nature is eminently fitted to bear along with it the forces coming from the Moon on to the Earth. So it comes about that it is water which distributes the lunar forces throughout the earthly realm. There is a certain kind of relation between the Moon and the water on the Earth. Let us suppose that after a rainy spell there is a full moon. Now the forces coming from the Moon when it is full causes something tremendous to happen on Earth. They shoot right into the whole growing forces of the vegetable kingdom. They cannot do so if there has not been a rainy spell beforehand. We must always realise the importance of sowing seed after rainy days followed by the full moon and we should never work at random (true, something will always come up). The question: How to connect our seed-sowing with rain and full Moon has definite practical importance, because the forces that come from the Full Moon work powerfully and abundantly on certain plants after rain but only weakly and sparingly after a spell of sunny weather. The old adages of husbandry contained such knowledge.

Furthermore around the Earth we find the atmosphere. In addition to consisting of air, the atmosphere has the property of being sometimes warm and sometimes cold. At times there is certainly accumulation of heat which, if the tension becomes too great, may discharge itself in a thunderstorm. Now what can we say about warmth? Spiritual observation shows that while water has no relation to silicon, warmth is so powerfully related to it that it enhances the activity of the forces working through silicon, namely, the forces coming from Saturn, Jupiter and Mars. These forces coming from Saturn, Jupiter and Mars have to be valued on quite a different scale from that adopted in the case of Moon Venus and Mercury, for it must be remembered that Saturn takes thirty years to go round the Sun, while the Moon takes only about twenty-eight days to pass through all its phases. Thus Saturn is only visible for fifteen years, consequently stands in quite another relation to the growth of plants compared with the Moon. As a matter of fact Saturn is not only active when it is shining down on the Earth, it is also active when its rays have to pass from below, as it were, through the Earth.

The strength with which the Saturn forces influence plant life on Earth always depends upon the warmth-condition of the air. If the air is cold they cannot reach the plants, if the air is warm they can. How then can we see their influence at work in the plant? We see it not in the annuals but in the perennials; not in those plants which grow up and die in the course of one year leaving only their seed behind them but in those which are perennial. It is the latter whose growth Saturn promotes with the help of the warmth forces of the Earth. The effect of these forces working through the mediation of warmth, is to be seen, for instance in the bark or cortex of trees and in everything that makes the plant a perennial. When the lives of plants are limited to the short span of a single year, it is because of the relation in which those plants stand to the planets with short periods of revolution. On the other hand, that which emancipates itself from the fleeting process and is made permanent in the formation of bark around the growing trees is connected with the planetary forces working through the mediation of warmth

and cold, and the periods of revolution in these cases are long. Thirty years in the case of Saturn, twelve in the case of Jupiter. Again it is well for anyone who wants to plant an oak tree to know something of the periodicity of Mars, for an oak tree planted during the appropriate period of Mars will thrive much better than one planted unthinkingly, at any moment that happens to be convenient. Or, if you have a plantation of conifera, where the Saturn forces play so great a part, it will make all the difference if the trees are planted when Saturn is in the so-called ascending period or at another time. Anyone who has insight into these matters can tell quite accurately in the case of plants that are doing well or badly whether or not they have been tended with a right understanding of their relation to planetary forces. For what is not always obvious to the external eye is revealed to more intimate observation.(1)

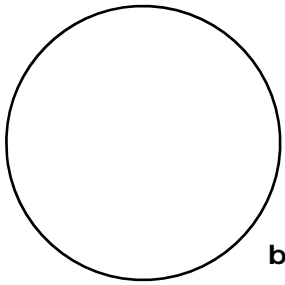
The Three Worlds

We find above all that when through Imagination and Inspiration we enter the spiritual world in full consciousness, it immediately appears to us to be threefold. Hence we can speak of the world, and of our theme, the evolution of the world and of man, only when we have come to the point we have now reached. Only now can I speak of how a man, confronted by the external world, by all that manifests itself to the senses, is really facing the spiritual world in its threefold nature — facing actually three worlds. Once the veil has been lifted which creates the chaos, we no longer have one world only before us, but three worlds, and each of the three has its definite connection with the human being.

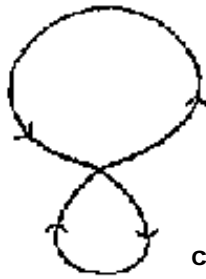
When we succeed in penetrating this veil of chaos — later I shall be showing how we can also describe this as crossing the threshold of the spiritual world — we perceive the three worlds. The first of the three is really the world we have just left, somewhat transformed but still there for spiritual existence. When the veil of chaos has been thrust aside, this world appears as though it were a memory. We have passed over into the spiritual world; and just as here we remember certain things, so in the spiritual world we remember what constitutes the physical world of the senses. Here, then, is the first of the three worlds.

The second world we encounter is the one I have called in my book, *Theosophy*, the soul-world. And the third world, the highest of the three, is the true spiritual world, the world of the spirit.

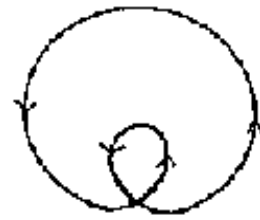
To begin with, I shall give you only a schematic account of all this, but from the way these three worlds are related to man you will gather many things about them. To these three worlds as they appear in three ascending stages — the lowest, the middle one, and the highest — I will then relate man's three members — the head; then the breast-organisation embracing all that is rhythmical, the breathing system and blood circulation; thirdly, the metabolic-limb system, which includes nutrition, digestion and the distribution throughout the body of the products of digestion, all of which engender movement. All this has to do with the metabolic-limb system. If this scheme were drawn, there would have to be a closed circle for the breast; for the head a circle left open, and open also for the limb system. When perceived physically, man's head appears to be closed above and would have to be drawn so, but perceived spiritually, it is open.



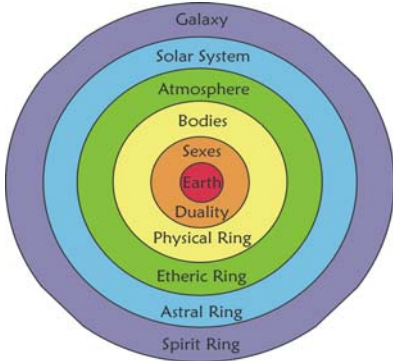
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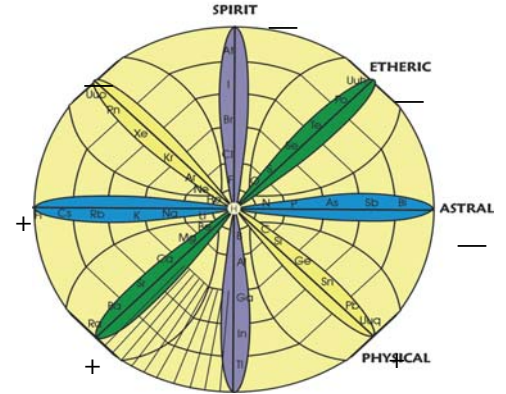


Stage 1
Archetype
Thesis
Passive
The Constant Field
Spirit
Saturn



Stage 2
Forming
Antithesis
Pulsating
Surrounding the form
Soul
Jupiter

South



Stage 3
Manifestation
Synthesis
Enfolded
Form
Body

The part of a man which does not belong at all to the realm of the spirit is the bony system, which is entirely of a physical nature; and when spiritually you study the human head, its thick skull is not seen. Only the skin is visible where the hair grows.

When this is looked at spiritually, however, something else appears. Ordinary hair is not there at all, but purely *astral* hair; in other words, *astral* rays which penetrate into the human organism and are held back, to some extent, only by the physical hair. But it is just where there is bone in the organism that the spirit can enter most easily, and this it does in the form of rays. So, on first looking at a man with your physical eyes, you see his physical form with the head above, and on his head — if he is not already bald — there is hair. But then, where the dome of the skull comes, spiritually you see nothing of the physical man; you see *Spirit filled Cosmic Force* rays, sun-like rays, pouring into him from the spiritual worlds.

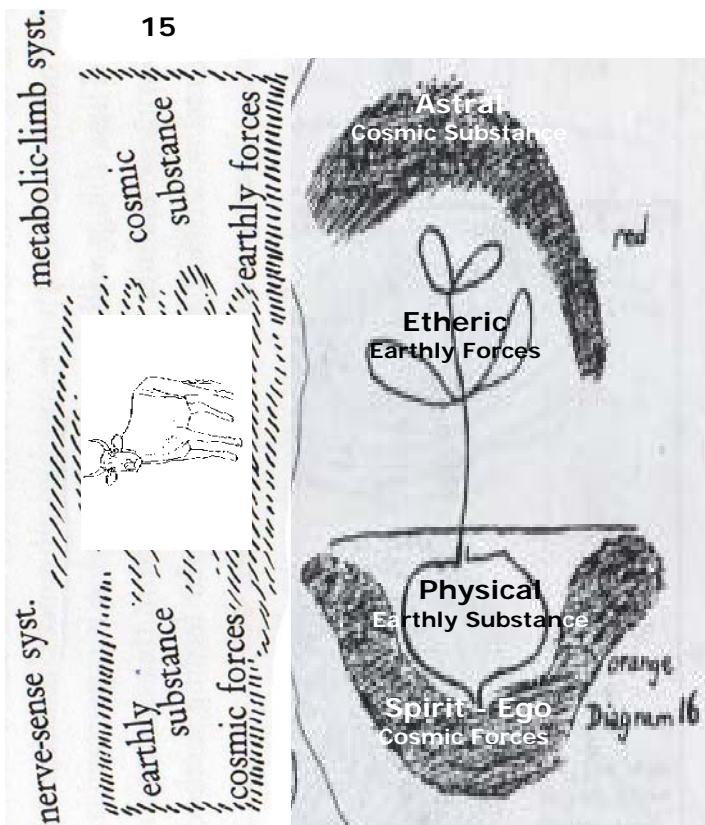
Thus the reason for the circle not being closed for the head is that the surrounding bony vault of the skull enables the spirit and *Cosmic Forces* to have continual access there. Nothing in a man is without purpose. By deliberate intent of the ruling powers — one might say — he has been given a head thus closed above, for here the spirit has the easiest access to his inner being because of the very thickness of the bone.

When we are in a position to observe man spiritually, we are astonished to discover how empty his head is of anything drawn from his own inner being. As regards the spiritual, he has almost nothing in him to fill the hollow globe sitting on his shoulders. Everything spiritual has to enter it from outside, as *Cosmic Forces*.

It is not thus with the other members of the human organism; as we shall soon hear, these are by their very nature *energetic*. We can distinguish in man three members — head, or nerves and senses system, rhythmic system, metabolic-limb system, and they have a quite definite relation to the three worlds: the physical world, the soul-world, and the spiritual world. I will now go further into this.

First of all, it will be well to distinguish, in each of the three worlds, **substance** from **activity**. In reality, substance and *force* are one, but they work in different ways in the world. You gain a clear idea of this from the substance of your own being. You have substance in your arm, and when this substance is out of order you will feel pain of some kind; it is obvious that something within the substance of the arm has gone wrong. If the *force* of the arm is not properly controlled, you may perhaps hit your neighbour and he feels pain. This shows that the *force* is out of gear. Nevertheless, though manifesting outwardly in different ways, the substance and *force* in your arm are one.

If now we turn to the human head, we find its *Earthy* substance derived entirely from the physical world. During the formation of the human embryo the *Earthy* substance of the head comes from the parents; and the subsequent development of the head, and of the whole head and nerve-senses system, depends for its substance entirely on the earthly-material world. On the other hand, all the activity that has to do with the plastic forming of a man's head, the activity by means of which its *Earthy* substance is given *shape*, comes entirely from the spiritual world as *Cosmic Forces*. So that in respect of activity, the head is entirely a *Cosmic* formation. Therefore the head has to be left open — in a spiritual sense — so that *Cosmic Forces* can play into it.



At any time of life you can thus say: The substance of my head comes entirely from the Earth, but it is put together and plastically formed in such a way that it cannot be the work of earthly forces. The forms of this human head are shaped entirely from the spiritual world; *by Cosmic Forces*, they might be called a heavenly creation. Anyone who contemplates spiritually the human head, in relation to the world, has to go far and deep.

Now in the same way he turns his gaze to a plant. He says to himself: The plant has a definite form *from the Stars*. Its substance is drawn from the earth, but its form comes from the

etheric world — hence still from the spatial world.

Then he looks at an animal. The animal — he will say to himself — derives the *Earthly* substance of its head entirely from the world of space, but something *Cosmic* certainly flows into its *Force* activity.

When we come to the human head, however, we find for the first time that something of the highest spirituality, something that can be called heavenly, is playing in. We see that the human head could never arise from earthly forces, though its substance is taken from earthly materials. So in the human head, which is itself a kind of miniature Cosmos, the spiritual world builds up a *Cosmic force* form out of earthly substance.

It is precisely the reverse with the metabolic-limb system, which embraces the organs for external movement — legs, arms — and the extension of these within the body — the digestive system. *There we see Earthly Forces directing Cosmic Substance.*

For the present I am leaving out the middle system — the rhythmical system which embraces breathing and the circulation of the blood. I will deal now with the system which brings together the processes of digestion and nourishment, and the inner combustion which enables a man to move.

Now the substance of this metabolic-limb system is not derived from the Earth. Improbable as it may sound, you bear within your metabolic-limb man something which is not of earthly origin but consists wholly of *Cosmic* substance from the third world, the world of the spirit. You may say: But I can see my legs; they are physically perceptible, which they would not be if they consisted of *Cosmic* substance. This objection is quite justified, but there is something more to be considered.

Your real legs are indeed *cosmic* throughout; your real arms too; but the material for them is provided by your head. The head is the organ which fills spirit arms, spirit hands, spirit legs, spirit feet, with substance; and this *Cosmic* substance penetrates into the spirituality of the limbs and of the digestive organs. So that something which in reality belongs entirely to the spiritual world is permeated, flooded, with physical matter by the head. That is why it is so difficult to grasp with the ideas of physical science that a man consists of head-breast-limbs-digestive organs. People think of the head as being there at the top, and they assume that when a man is decapitated he has no head left. It is not so, however; a man is substantially head all over. Even right to the end of his big toe he is head, for his head sends down its substance there. It is only the *Earthly* substance of the head that is earthly in origin, and the head gives its earthly-material character to the other substances; while the *Cosmic* substance of the metabolic-limb organs comes from the spiritual world.

If through vigorous auto-suggestion of a negative kind we can suggest away the head of a man, so that in appearance he is headless, and if we can do this not only in thought but so that we really see the man as headless, then the rest of his organism also disappears; with the head goes the whole of the man as a being perceptible to the senses. And if the head is then to be there

for us at all, the rest of the man has to be perceived spiritually. For in reality we go about under the imprint of higher worlds, with spirit legs, spirit arms, and it is only the head that fills them with physical matter.

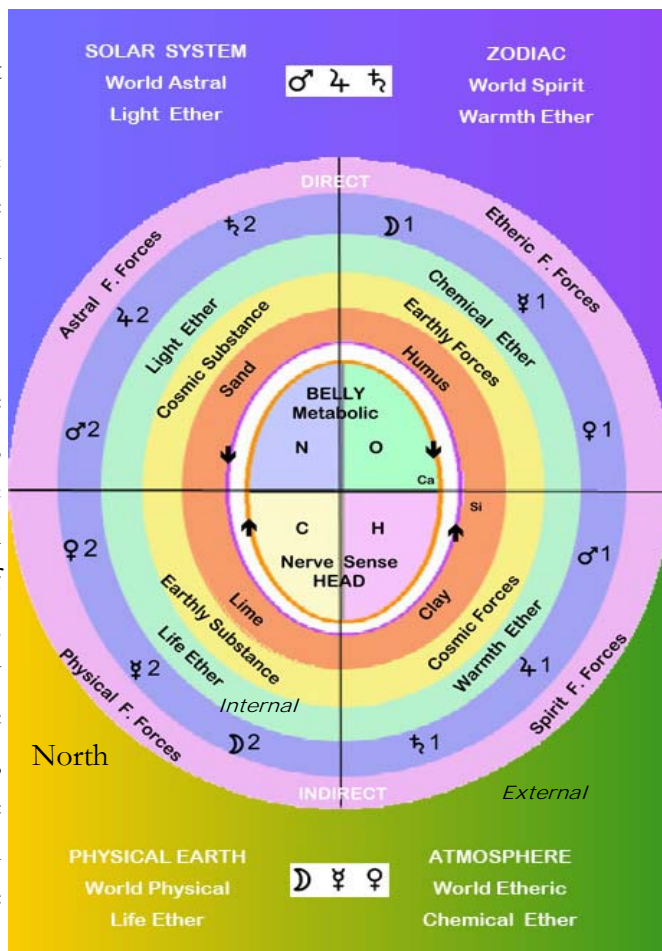
On the other hand the *Earthly* forces, the activity, for all that makes up the metabolic-limb man are drawn from the physical world. If you make a step forward or lift an arm, the mechanism involved, and even the chemical processes that take place in moving an arm or leg, or the chemical processes in the digestive organs — all this activity is the earthly *forces*. So that in your limbs you bear invisible *Cosmic* substance, but *Earthly* forces drawn from earthly life. Hence we are built up as regards our head and its substance out of the Earth, but this same head is permeated with heavenly forces. In our limbs we are built up entirely from heavenly substance; but the forces playing into this heavenly substance during our life on Earth are earthly forces — gravitation and other physical and chemical forces all belonging to the Earth.

You see, therefore, that head and limbs are opposites. The head consists of earthly *substance* and is given plastic form by *cosmic forces*. The limbs and the digestive system are formed wholly of *cosmic* substance, and would not be visible were they not saturated with earthly substance by the head. But when anyone walks, or grasps something, or digests food, the *cosmic* substance makes use of earthly forces in order that life on Earth, from birth to death, may be carried on.

In this complicated way does a man stand in relation to the three worlds. The spiritual world participates with its activity in the head; with its *Cosmic* substance it participates in a man's third organisation, his metabolic-limb system.

The lowest world, the world most dominated by the senses, participates through its *Cosmic Substance* activity in the metabolism and the movement of the limbs, and through its *Earthly* substance in the head; whereas the substance in a man's third system is wholly *Cosmic*.

In the middle system, which embraces the breathing and the circulation of the blood, spiritual activity and material substance work into each other. The spiritual activity, flowing through the movement of our breathing and the beating of our heart, is always accompanied to some extent by substantiality. And, in the same way, the substantiality of earthly existence, inasmuch as oxygen streams into the breathing, is to some extent accompanied by earthly activity. So you see that in the



middle man, in man's second system, everything flows together — *Cosmic* substance and Cosmic Forces flow in here; earthly *forces* and *earthly* substance flow in there. By this means we are made receptive both to the activity of the middle world and to its substantiality.

So in this middle man there is a great deal of intermingling and for this reason we need our wonderfully perfect rhythmical system — the rhythm of the heart, the rhythm of the lungs in breathing. All the intermingling of *force* and substance is balanced, harmonised, melodised, through these rhythms, and this can happen because man is organised for it.

In the head system and the limb system, *force* and substantiality come from quite different sources, but in the middle system they come from all three worlds and in a variety of ways — at one place *force* accompanied by substance, in another place substance accompanied by *force*; here pure activity, there pure substance — all these variations flow through the middle man. If as a doctor you take a man's pulse, you can really feel there the balancing of the heavenly nature of the soul against earthly activity and substantiality. Again, if you observe the breathing, you can feel a man's inner striving for balance between the various agencies which relate him to the middle world.

All this is very complicated, you will say. It is true that a lecture-course is generally easy to understand up to a certain stage, but when it comes to the point where man's relation to the world has to be grasped, people often say: “This is becoming very difficult — we can't keep up with it.” (8)

We have tried, again from a particular aspect, to place the human being into the universe. Today we wish to put the subject forward in a way which will, as it were, weld everything into a whole. During our physical life we live upon the earth; we are surrounded by those events and facts which are there because of the physical matter of the earth. This matter is moulded and shaped in the most varied manner so as to be adapted to the beings of the kingdoms of nature, up to the human form itself. The essential element in all this is the physical matter of the earth. Today — because we shall immediately have to speak about its opposite — let us call this matter the physical substance of the earth, comprising all that provides the material basis for the various earthly forms; and then let us differentiate from it everything in the universe which is the opposite of this physical substance, namely *Cosmic* substance. This last is the basis not only of our own soul, but also of all those formations in the universe which, as spiritual formations, are connected with physical formations.

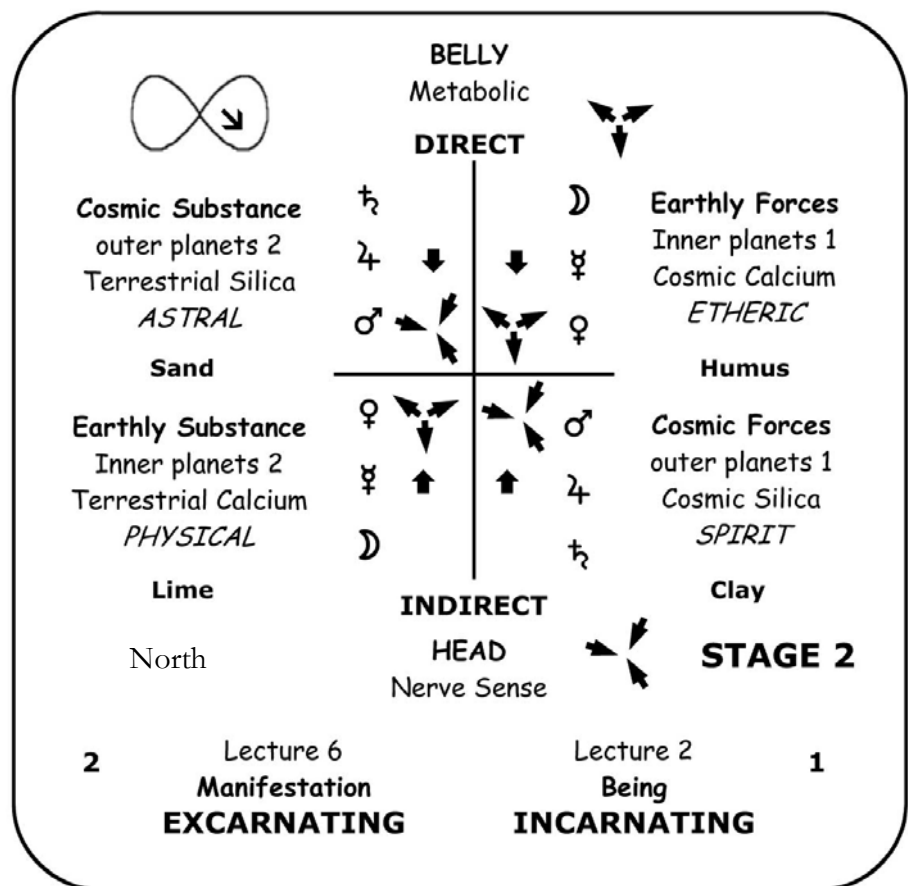
It is not right to speak only of physical matter or physical substance. Think only of the fact that we must place into the total picture of the world the beings of the higher hierarchies. These beings of the higher hierarchies have no earthly substance, no physical substance, in what in their case we would call their bodily nature. What they have is spiritual substance. When we look upon what is earthly, we become aware of physical substance; when we can look upon what is outside the earthly, we become aware of spiritual substance.

Today people know little of spiritual substance. That is why they also speak of that earth-being,

who belongs both to the physical and the spiritual — the human being — as though he, too, only possessed physical substance. This, however, is not the case. Man bears both spiritual and physical substance in himself in so remarkable a way as to astonish anyone who is not accustomed to pay heed to such matters. If, for example, we consider that element in man which leads him into movement, namely what is connected with the human limb-system and its continuation inwards as digestive activity, then it is incorrect to speak primarily of physical substance. You will soon understand this still more exactly. We only speak correctly about the human being when we regard the so-called lower part of his nature as having as its basis what is in fact *Cosmic* substance. So that, if we were to represent the human being schematically, we would have to say: The lower man actually shows us a formation in *cosmic* substance, and the more nearly we approach the human head, the more is man formed of *Earthy* substance. Basically the head is formed out of *Earthy* substance; but of the legs — grotesque though this may sound — it must be said that essentially they are formed of *cosmic* substance. So that, when we approach the head, we must represent the human being in such a way that we allow *cosmic* substance to pass over into *earthy* substance; in the human head where in particular *earthy* substance is contained. *Cosmic* substance, on the other hand, is diffused in a particularly beautiful way just where — if I may put it so — man stretches out his legs, stretches out his arms, into space. It is really as though the most important matter for arm and leg is precisely this being filled with *cosmic* substance, as if this is their essence. In the case of arm and leg it is really as though the physical substance were only swimming in the spiritual substance, whereas the head presents a compact formation composed of physical substance. In a form such as man possesses, however, we

must differentiate not only the *substance*, but also *the forces*. And here again we must distinguish between *cosmic* forces and earthly, physical forces.

In the case of the forces, things are completely reversed. Whereas for the limb-system and digestion the substance is *cosmic*, the forces in the limbs, for instance in the legs, are heavy, *earthy* forces. And whereas the substance of the head is



physical, the forces active within it are *cosmic*. Spiritual forces play through the head; physical forces play through the *cosmic* substance of the limb and metabolic system in man. The human being can only be fully understood when we distinguish in him the upper region, his head and also the upper part of the breast, which are actually *earthly* substance worked through by *cosmic* forces (I must mention that the lowest spiritual forces are active in the breathing). And we must regard the lower part of man as a formation composed of *cosmic* substance, within which *earthly* forces are working. Only we must be clear as to how these things are interrelated in man, for the human being also projects his head-nature into his whole organism, so that the head — which is what it is because it is composed of *earthly* substance worked through by *cosmic* forces — the head also projects its entire nature into the lower part of the human being; and what man is because of his *cosmic* substance, in which *earthly* forces are at work, this, on the other hand, plays upwards into the upper part of the organism. In these activities in the human being there is mutual interaction. Man can in fact only be understood when he is regarded in this way, as composed of *earthly—cosmic* substantiality and *earthly—cosmic forces*, that is to say what is of the nature of forces.

This is something of great significance. For if we look away from external phenomena, and enter into the inner being, it becomes clear to us, for instance, that no irregularities can be allowed to enter into this apportioning of what is of the nature of substance and of forces in the human being.

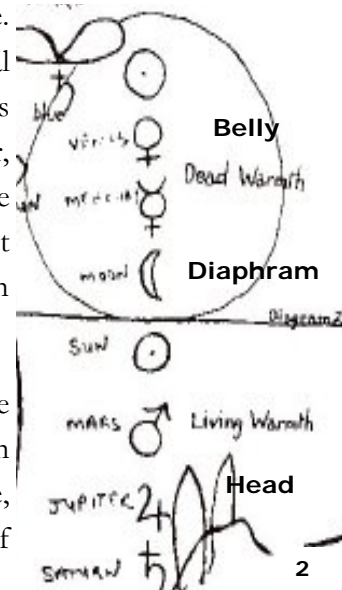
Earthy Substance stays in the Metabolism

If, for example, what should be pure substance, pure *cosmic* substance in man, is too strongly penetrated by physical matter, by *earthly* substance — if, that is to say, *earthly* substance which should in fact tend upwards towards the head, as '*Ash*', makes itself too strongly felt in the metabolism — then digestion becomes too strongly affected by the head-system, and man becomes ill; certain quite definite types of illness then arise. And then the task of healing consists in paralyzing, in driving out, the *earthly* substance-formation which is intruding into the *cosmic* substantiality. On the other hand, when man's digestive system, in its peculiar manner of being worked through by *earthly* forces in *cosmic* substance, when this digestive system is sent up towards the head, then the head becomes, as it were, too strongly spiritualised, then there sets in a too strong spiritualisation of the head. And now, because this also presents a condition of illness, care must be taken to send enough *ashed* physical forces of nourishment to the head, so that they reach the head in such a way that they do not become spiritualized. (*see pg 43*)

Anyone who turns his attention to man in health and sickness will very soon be able to perceive the usefulness of this differentiation, if he is really concerned with truth, and not with external illusion. But something essentially different also plays into this matter. (9)

Plants and Soil

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.

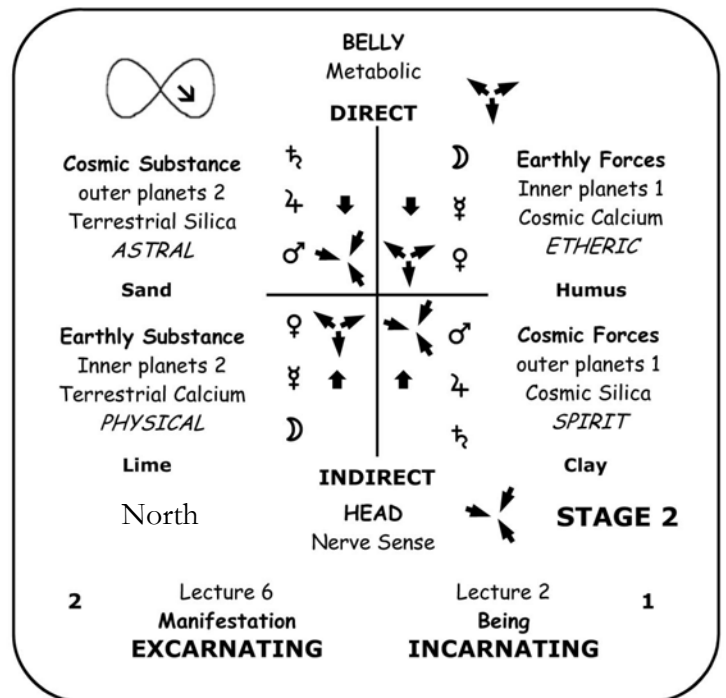
Why do I say that the agricultural individuality is standing on its head? For the following reason. Take everything there is in the immediate neighbourhood of the Earth by way of air and water vapours and even warmth. Consider, once more, all that element in the neighbourhood of the Earth in which we 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.

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:

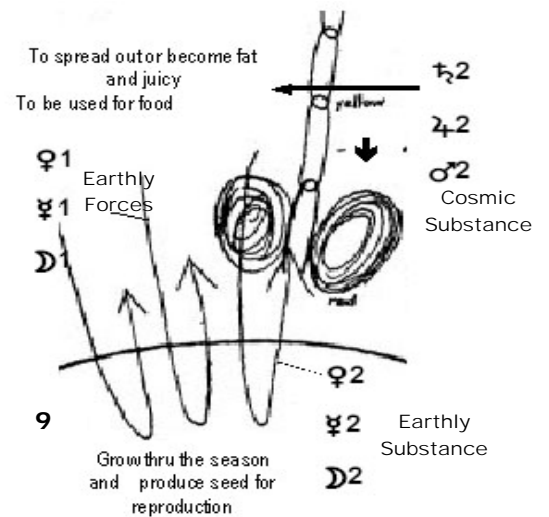
It is first received by the Earth *from the Cosmic Substance*, and the Earth then rays it upward again. Thus, *the Cosmic Force* influences that rise upward from the earthly soil — beneficial or harmful for the growth of plants — are in reality cosmic influences rayed back again. *The Cosmic Substance* 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).



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.

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.

What comes from beneath as good or bad vegetable growth are really the cosmic *force* influences which are reflected from below; whereas in the air and water above the earth, the cosmos exercises its power directly. The direct cosmic in-streaming, *Cosmic Substance*, is stored up beneath the earth's surface, and from there works back, *as Cosmic Forces*. The inherent qualities of the soil affecting the growth of plants are dependent upon these stored up *cosmic force* influences. The soil still retains in it the effects of influences dependent upon the most remote parts of the Cosmos, which need to be considered in connection with the Earth.

Let us suppose that we want to **hold back these *Cosmic forces***, which work upwards from the root through the stem into the leaves, and store them up in the region of the root. This possibility is no longer fully open to us in the present epoch of our earth, since genera and species of plants have been so firmly established. Formerly, in ancient epochs when men could easily transform one plant into another, this possibility had to come greatly into consideration. Today we consider it only from the point of view of finding out the condition favourable to a given plant. How can we then set about preventing these forces from pushing upwards into blossom and fruit? How can we in addition hold back the development of stem and leaf within the formation of the root? We must place such a plant on sandy soil. For silicon or flint holds back the Cosmic Forces and even gathers them. Now the potato plant is one in which the growth of leaf and stem is held back. The potato is a root-stock. The forces that form leaf and stem are held fast in the potato itself. The potato is not a root but a stem which has been held back. Potatoes must therefore be planted on sandy soil; this is the only way of holding back the Cosmic Forces in them.

Let us plant two experimental beds with wheat and sainfoin respectively. Then, if silica *sand* has been added to the soil, you will be able to observe that the wheat (a plant whose natural and

permanent tendency it is to produce seed) is being hampered in its seed formation. In the case of the sainfoin you will also see that the seed formation is either completely suppressed or is retarded. In such "experiments" you can always take the effects on the cereal as the basis for comparison with the corresponding effects on sainfoin as representing leguminous plants. In this way very interesting experiments can be made in seed-formation.

QUESTION: Does it make any difference whether the soil underneath is sand or clay? Often people put a ground layer of clay where the manure is to be, so as to make the ground impervious.

ANSWER: It is quite true that different kinds of soil have a definite influence which proceeds from the particular qualities of the soil in question. A sandy soil does not retain water; it is therefore necessary to put some clay with it before laying the manure on it. If, on the other hand, you have a clay soil, you should break it up and strew sand over it. A middle course would be to have alternate layers of sand and clay. Then you have the earth consistency as well as the "watery influences. Without this combination of the two kinds of soil the water will percolate away. For the same reason, loose soil should certainly not be used as a foundation for the manure heap as it would have no value for the manure placed over it; in this case it is better to make your own foundation.

However this cosmic *force* upward flow is not enough by itself. There must also be present the opposite, which I could call the Earthly or terrestrial *Forces* streaming downwards. All that undergoes a kind of external digestion in the "belly" (the processes above the surface throughout Summer and winter are indeed a kind of digestion in relation in the growth of plants!) has to be drawn down into the earth. All *Earthly* forces produced by the action of water and air above the Earth, and also the substances in delicate homoeopathic distribution called from there, are drawn down into the earth by lime present in it in greater or smaller proportions. The lime content of the soil and the distribution of lime in homoeopathic dilution above the surface - these are the factors which have the task of leading the terrestrial forces down into the soil.

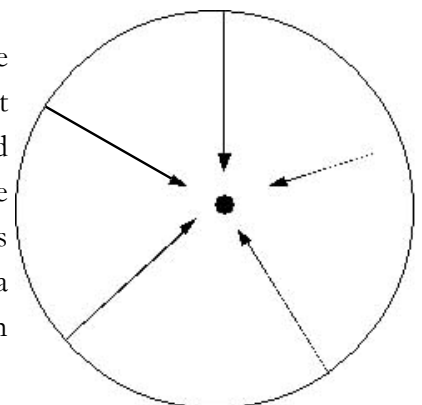
These things will take on a very different aspect in future when we shall have a real science concerning them and not only the scientific guesswork of today: it will be possible then to give exact information. We shall then know that there is a great, an immense difference between the warmth that exists above the surface of the Earth and which stands within the sphere of the *primary* influence of the Sun, Venus, Mercury and Moon and the warmth which makes itself felt within earth and which stands under the primary influence of Mars, Jupiter and Saturn. These two kinds of warmth which we may call the "blossom and leaf warmth" and the "root-warmth" respectively, are completely different from one another - so much so, indeed, that we can describe the warmth above the Earth as a "dead" warmth, the warmth below the Earths surface a "living" warmth. The warmth below the surface, especially during Winter contains an inner vital principle. If we human beings had to experience in ourselves this living warmth, which works within the soil we should all become immensely stupid because in order that we may be

intelligent beings, dead warmth has to be supplied to our bodies. But at the moment when the limestone and other substances enable warmth to be drawn into the soil and to change from outer into inner warmth it passes over into a condition of gentle aliveness. It is recognised today that there is a difference between the air which is above the Earth and that which is below the surface, but the difference between warmth above the Earth and that below the surface has been overlooked. It is generally known that the air under the Earth contains more carbonic acid, while that above the Earth contains more oxygen; but the reason for this is not known. It is that the air, as it is drawn into the earth, is penetrated by a gentle aliveness. This is true both of warmth and of air. They both receive a tiny spark of life as they pass into the earth. It is different in the case of water and of the solid earth element itself. Both of these have less life inside the Earth than they have when above its surface. They become "more dead", they lose something of their life they had outside. But it is precisely this circumstance which exposes them to the influences of the most distant cosmic forces.

Now with regard to the cultivation of the soil there is a point of great importance which must be thoroughly understood. It is a point I have often dealt with amongst Anthroposophists. It is that we know the conditions which the forces of the cosmic spaces can work upon the earthly realm. Let us begin with seed formation. The seed which gives rise to the embryo of the plant is generally regarded as a molecular structure of exceptional complexity, and science lays great stress upon this interpretation. The molecules it is said have a certain structure, in simple molecules it is simple, in complicated molecules it becomes more and more complex, until we come to the extreme complexity of the albuminous or protein molecule. People stand in wonder and astonishment at the enormous complexity of the structure supposed to exist in the seed.

They do so because they reason as follows. The albumen (or protein) molecule, they say, must be of enormous complexity, for the organism in succeeding plants arises from it. This organism is enormously complex, and since its structure was determined by the embryonic conditions of the seed, the latter's microscopic or ultra-microscopic content must also have a structure of enormous complexity. Well, it is complex indeed in the beginning. As the earthly albumen is formed, its molecular structure is driven to the utmost complexity; but this alone would never give rise to a new organism. For the organism arising from the seed does not proceed by a mere continuation in the offspring of what was present in the parent plant or animal.

What happens is that when the embryonic structure has reached the highest stage of complexity in the earth domain, *during pollination*, it falls to pieces and becomes a "little chaos". It breaks up and dissolves, one might say, into "world-dust". And when this little chaos of world-dust is there, the whole surrounding cosmos begins to work upon it to stamp it with its own image and to build up in it a structure conditioned by the forces of the Universe working in upon



it from every side (see drawing no. 3). Thus the seed becomes an image of the Cosmos. Every time this happens, and seed formation is carried through to the point of chaos, the new organism is built up from the seed-chaos by the activity of the cosmos. The parent organism has only the tendency to bring the seed to such cosmic position that through its affinity with this cosmic position the *appropriate* forces will act in the proper direction so that, eg a dandelion will give rise to another dandelion and not a berberis.

But the new thing that is built up is always the image of some cosmic constellation. It is built up out of the cosmos. And if in the Earth we would make effective the forces of the cosmos, we must drive the earthly elements into the state of greatest possible chaos. This has to be the case whenever we want the cosmos to act upon our Earth. In the case of plant-growth this is in a certain sense provided for by nature herself. But just because every new organism is built up by the Cosmos it is necessary that **the cosmic principles must be allowed freedom to work in the organisms until the seed-formation is completed.**

If for example, we plant the seed of a given plant in the earth the seed contains the impress of the whole cosmos from a particular cosmic direction, which means that it came under the influence of a particular *star* constellation and received its particular *archetypal species* form. At the moment when the seed is placed in the soil it is strongly worked upon by the *Earthly Forces* and it is filled with the longing to deny the Cosmic Forces, in order that it may spread and grow in all directions. For the *Earthly Forces* above the surface of the Earth, do not want the plant to retain this cosmic form. The seed had to be driven to the point of chaos *at pollination*; but now that the plant is sprouting it is necessary to oppose the *Earthly* to the Cosmic Forces, which live as the form of the plant inside the seed. For the Cosmic Forces must be opposed and balanced, as it were, by the *Earthly Forces*. We must help the plant to become more akin to the Earth in its growth. This can only be done by introducing into the plant some form of living earthly matter which has not yet reached the state of chaos and seed formation, life which has been held up in a plant before the seeds have been formed. For this purpose a rich humus formation comes to man's assistance. In those districts that are fortunate enough to possess it. Man can hardly find any artificial substitute for the fertility given to the soil by Nature through **humus**. What causes formation of humus? It arises from the absorption of remnants of living plants into the whole process of Nature. These remnants have not yet reached the state of chaos and respect the Cosmic Forces, as it were. If humus is used for the growth of plants the *Earthly Forces* are held fast within them. The Cosmic Forces then work only in the upward stream that terminates in seed-formation. While the *Earthly Forces* work in the development of flowers, leaf and so on, the cosmos only radiates its influence into all this.

Let us suppose that we have before us a plant growing out of its own root. At the top end of the stem comes the grain of seed, while the leaves and blossoms spread out sideways. Now, in the leaf and the blossom *the above ground activities* are working in giving shape *through the Cosmic Substance* and filling it with matter, *via the Earthly Forces*; the reason why a leaf grows or a grain swells and takes up the substance inside it is to be found in the *Earthly Forces* which we lead to the plant and which have not yet reached the point of chaos. The seed, however whose *Cosmic* forces work upwards through the stem - vertically (not rotating around it, *which come*

from the Earthly Substance and shows as the tissue formation of leaves) - radiate the cosmic forces into leaves and blossoms. One can actually see this. We have only to look at the green leaves of a plant. In their shape *we see the Cosmic Substance*, in the substances filling them *we see the Earthly Forces* and in their green colour, the leaves bear *the above ground elements*. But they would not be green, if they had not within them the cosmic force of the Sun. And now look at the coloured blossoms. In these the cosmic forces of the Sun are not working alone, but are supported by the primary distant planets Mars (1), Jupiter (1) and Saturn (1). If we regard the growth and development of plants from this point of view, we shall see the redness of the rose as the force of Mars, the yellow of the sunflower (so-called only because of its shape) as the *cosmic* force of Jupiter. It should be called the Jupiter flower, for it is the force of Jupiter that reinforces the solar force and brings forth the white and the yellow colours in the flowers. The blue of chickweed or chicory flower is the effect of Saturn reinforcing the effect of the Sun. Thus we can see Mars in the red coloured flower, Jupiter in the yellow, Saturn in the blue, while in the green colour of the leaf we see the Sun Itself.

QUESTION: Should we take any special measures to strengthen the tendency of the seed to be "driven into chaos"?

ANSWER: One can strengthen it but there is no need to do so, because if seed formation comes about at all then there is always a maximum of "chaos". It therefore does not need to be strengthened. Any necessary strengthening must be done to the manure; but it is not necessary for the seed formation. We could, of course, do something by making the soil more silicious, *with clay and sand*. For it is through silica *clay* that the Cosmic Forces work which have been absorbed into the earth. -"One could do it in this way, but I do not think that it is necessary, *unless seed formation does not occur, which can be the case with an overly sandy soil*.

Roots

But the same powers which appear as colour in the flower are also at work especially strong in the root. Here once more the forces living in the distant planets are active within the soil. If we pull a plant out of the ground we may see that in the *tap* roots there is Cosmic Force, in the blossom mostly the *earthly* element and only in the finest shading by the colour can the cosmic element be seen. The *Earthly* Forces on the other hand, if *working* actively in the root, cause the root to push out into *a ramified* form. For the form of the plant is determined by factors arising in the realm of earth. It is the *Earthly* Forces that causes the form to spread. When the root develops and divides, it is due to the *earthly* forces working downwards just as the cosmic forces (in the case of the colour) work upwards. Single roots are therefore cosmic roots, whereas forked roots are due to the *earthly* forces working down into the soil, just as in colour the cosmic forces work upwards into the flowers, and the cosmic force of the Sun stands between the two. The Sun force works principally in the green leaves, in the interaction between blossom, root and in all that is between the two. Thus the Sun element really belongs to what we have called the diaphragm provided by the surface of the earth: whereas the Cosmic *Forces* belongs to the interior of the earth and works its way up into the upper part of the plant.

The *Earthy* Forces above the earth, works downwards and is drawn into the plant with the help of the limestone. Plants which draw down the *Earthy Forces* into their roots through the lime, are those whose roots divide in all directions such as all herbs used for fodder, (but not turnips) and such as the sainfoin. Thus it should be possible, looking at the form of a plant and the colour of the flowers, to tell how much cosmic forces and how much *Earthy* Forces are at work in it.

Now let us assume that we find some means of **holding back the cosmic forces** within the plant. *I referred earlier to the role sand plays in this regard. However the plant kingdom also offers us an opportunity.* These *cosmic* forces will then be prevented from manifesting *themselves* by pushing up into flowers, but will live out their life in the region of the stem of the plant. Now wherein do these Cosmic Forces reside in the plant? They reside in the silicon. Take the **Equisetum**. It has this very property of attracting silicon and permeating itself with it. It is 90% silicon. Thus in this plant the cosmic element is present to a tremendous extent. It does not manifest itself in flowers, but in the growth of the lower part of the plant.

The ABC of everything concerning the growth of the plant consist therefore, in knowing what in any particular plant is cosmic origin and what is due to terrestrial forces. How can we make a soil more inclined to condense, as it were, the Cosmic Forces to retain them in root and leaf? How can we thin them out so that they can be sucked upwards into the blossoms and colour and even into the fruit and permeate them with a delicate taste? For the delicate taste in an apricot or plum is like the colour of a flower, both being due to the Cosmic Forces which have worked their way upward through the plant, *being met by the Cosmic Substance process above*. In the apple you are literally eating Jupiter, in the plum you are eating Saturn.

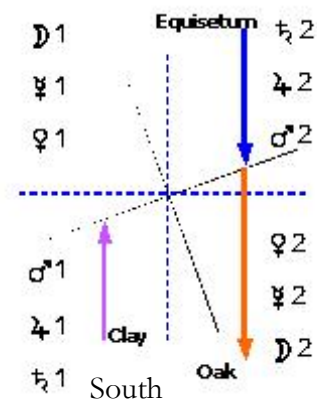
It is imperative that our knowledge should penetrate to the actual structure of Nature. For example, man knows more or less what happens to air inside the earth, but he hardly knows any thing of what happens to light inside the Earth. He does not know that Silicon, the cosmic mineral, takes up light into the Earth and there makes it active, whereas humus, the substance closely allied to terrestrial life does not take up light and make it active in the earth but produces a lightless activity there. But these are the things which will have to become understood and known.

From this we are able to see how we must proceed if we are to influence plant-growth in one way or another. We have to take account of these two sets of forces.

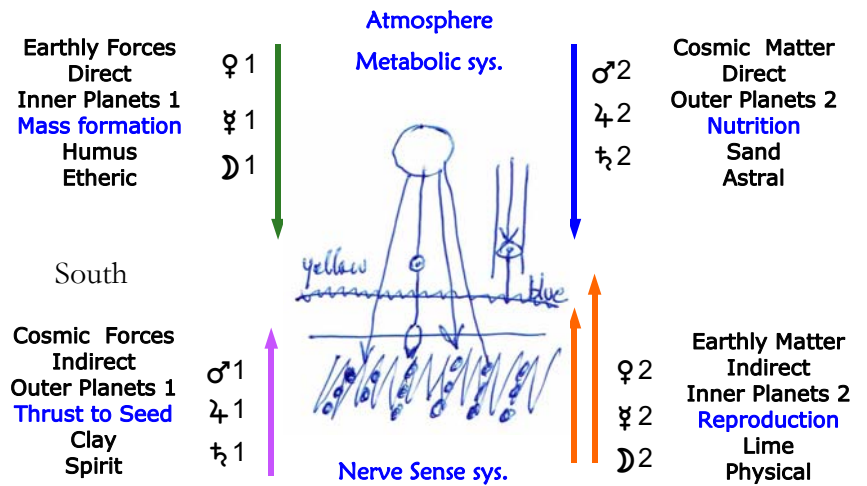
Fungus - Rots

Now, from everything I have said on this subject, you will have gathered that the soil immediately surrounding a plant has a definite life of its own. These life forces are there and with them all kinds of forces of growth and tender forces of propagation not strong enough to produce the plant form itself, but still waiting with a certain intensity; and in addition all the forces working in the soil under the influence of the Moon and mediated through water. Thus certain important connections emerge, in the first place you have the earth, the earth saturated

with water. Then you have the moon. The moon beams, as they stream into the earth, awaken it to a certain degree of life, they arouse "waves" and weavings in the earth's etheric element. The moon can do this more easily when the earth is permeated with water, less easily when the earth is dry. Thus the water acts only as a mediator. What has to be quickened is the Earth itself, the solid mineral element. Water, too, is something mineral. There is no sharp boundary, of course. In any case, we must have lunar influences at work in the earth. Now these lunar influences can become too strong. Indeed this may happen in a very simple manner. Consider what happens, when a very wet spring follows upon a very wet winter. The lunar force enters too strongly into the earth, which thus becomes too much alive. I will indicate this by red dot's. (See Diagram No. 11). Thus if the red dots were not here, i.e. if the earth were not too strongly vitalised by the moon, the plants growing upon it would follow the normal development from seed to 'fruit; there would be just the right amount of *reproductive* lunar force, *supported Earthly Substance*, distributed in the earth to work upwards, *upon the Cosmic Forces 'train'* to produce the requisite fruit seed. But let us suppose that the lunar influence is too strong - that the earth is too powerfully vitalised - then the *Earthly Substance* forces working upwards become too strong, and what should happen in the seed formation, *due to the Cosmic Forces activity*, occurs earlier. Through the very intensity the *Earthly Substance*, the *Cosmic* forces do not proceed far enough to reach the higher parts of the plant, but become active earlier and at a lower level. The lunar influence has the result that there is not sufficient *Cosmic Force* strength for seed formation. The seed receives a certain portion of the decaying *reproductive* life force, and this decaying life forms another level above the soil level. This new level is not soil, but the same *Earthly Substance* influences are at work there. The result is that the seed of the plant, the upper part of the plant becomes a kind of soil for other organisms; parasites and fungoid formations appear in it. It is in this way that blights and similar ills make their appearance in the plant. It is through a too strong working of the moon that the *Cosmic* forces '*train*' working upward from the earth are prevented from reaching their proper height. The powers of fertilisation and *reproduction* depend entirely upon a normal amount of lunar influence. It is a curious fact that abnormal developments should be caused not by a weakening but by an increase of lunar forces. Speculation might well lead to the opposite conclusion. Looking at it in the right way shows that the matter is as I have presented it. What, then, have we to do? We have to relieve the earth of the excess of lunar forces in it. It is possible to relieve the earth in this way. We shall have to discover something which will rob the water of its power as a mediator and restore to the earth more of its earthiness, so that it does not take up an excess of lunar forces from the water. This is done by making fairly concentrated brew (or tea) of *Equisetum arvense* (horse-tail), diluting it and using it as a liquid manure on the fields for the purpose of fighting blight and similar plant diseases. Here again only small quantities are required; a homeopathic dose is generally sufficient. As you will have realised, this is precisely where one sees how one department of life affects another. If, without indulging in undue



speculation, we realise the noteworthy effects produced by equisetum arvense upon the human organism by affecting the function of the kidneys, we shall have, as it were, a standard by which to estimate what this plant can achieve when it has been transformed into liquid manure, and we shall realise how extensive its effects may be when even quite a small quantity is sprinkled about without the help of any special instrument. We shall realise that equisetum is a first-rate remedy. Not literally a remedy, since plants cannot really be ill. It is not so much a healing process as a process exactly opposite to that described above. (1)



With regards the kidneys, Equisetum works by stimulating the activity of the Internal Astral body and Cosmic Substance against too strong a World Astral invasion. This then allows the internal astral to regain its control over the Internal Etheric and Earthly Forces, which brings the overly strong lunar processes into order.

We also need to remember the important role clay plays in the strengthening of the Cosmic Forces, and ensure that there is an adequate supply of this, to push through the strong lunar forces, especially in sandy soils.

We can go one step further. Healing is not based on the microscopic changes in tissues and cells, but on a knowledge of the larger connections; this must also be our attitude to the plant nature. And since plant nature is in this respect simpler than that of the animal or man, so its healing is a more general process and when sick it can be healed with a kind of "cure-all" remedy. If this were not so, we should often be in a fix with regard to plants, as we are with animals, though not with human beings. For a man can tell us where he feels pain. Animals and plants cannot; and it is fortunate that here the curative process is almost the same for all plants. A large number of plant diseases (although not all of them) can really be arrested as soon as they are noticed by a rational management of our manuring - namely in the following way: We must then add calcium to the soil by means of the manure. But it will be of no use if the calcium is not applied in a living condition. If it is to have a healing effect it must remain within the realm of the living. Ordinary lime or the like is of no use here. Now we have a plant which is very rich in calcium - seventy-seven per cent, of its substances is calcium albeit in very fine distribution. This is the oak and more especially its bark. In the bark we have something which is at an inter-mediate stage between plant and living earth. You will remember what I said to you about the kinship between bark and live earth. For calcium as required in this connection the calcium structure in the bark of the oak is almost ideal. Calcium in a living state (not dead, though even then it has an effect) has the property which I have already described to you: it

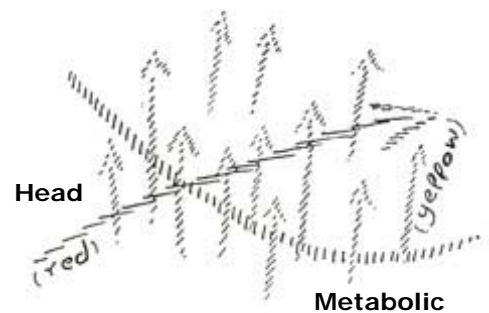
restores order where the etheric body is working too strongly so that the astral element is prevented from reaching the organic substances. Calcium kills (damps down) the forces of the etheric body and so sets free those of the astral body. This is characteristic of all limestone. But if it is necessary for an over-powerful etheric element to be damped down and contracted in a regular way - not suddenly nor jerkily so that shocks are produced - but in a steady and orderly fashion, we should use calcium in the particular form in which it is to be found in the bark of the oak tree.

Powdery Mildew

Fungal attacks, such as Powder Mildew, can occur from the opposite direction. Human phenomena such as diphtheria are especially able to teach us about certain subtleties in the plant organism. Such diseases should be studied more precisely, if only for the sake of discovering remedies.

In another context I have indicated that the child's acquisition of speech is accompanied by various organic processes. While he is learning to speak, and therefore while something special is taking place in his breathing organism, something also occurs polarically in his circulatory organism, which also receives into itself the metabolic processes.

I also pointed out, how what at puberty appears in a reciprocal relationship of the human being to the outer world, takes place inwardly in learning to speak. Thus this push of the astral body, which at puberty takes place from within the human being outward, takes place from below upward in the capacity for acquiring speech. *(from the metabolic towards the nerve sense)* So here we have an astralizing process, and we



will be able to see clearly that an interaction occurs where the respiratory and circulatory systems meet (see drawing). The astralizing process working from below upward (yellow arrows) encounters the developing organs of speech working from above downwards (red). In this encounter the organs of speech become stronger in their capacity for speech. It is what is taking place simultaneously below *in the metabolism*, that especially interests us here: this tends to work upward. The whole process is one from below upward (yellow arrows). Now, if the astrality presses upward too strongly while the child is learning to speak, we have a predisposition to diphtheric conditions. It is certainly important to pay proper attention to this.



Let us now consider the outer earthly *forces* process, *we see with plants*, that has a certain selective affinity for the process I have just described. Let this be the surface of the earth. In a plant that behaves appropriately in relation to the cosmos, the earth plays a part in the *nerve sense* formation of



its roots. With growth the influence of the earth diminishes and the *Cosmic Substance* influence becomes stronger and stronger, unfolding especially in the blossoms (see drawing, red). What develops here is a kind of external astralizing of the blossom, which then leads to the formation of fruit. If this process, which ought to occur in the normal course of the world processes, takes place below, it can only insert itself into the water, and we have what I have just called “dysentery of the earth.”

But we can also have another situation: What takes place when a plant develops properly — the blossom unfolding always a little above the earth's surface — *and can bring the Cosmic Substance* right on the earth's surface (see drawing below, red). Then fungi arise; this is the basis for fungus formation, *such as Powdery Mildew*.

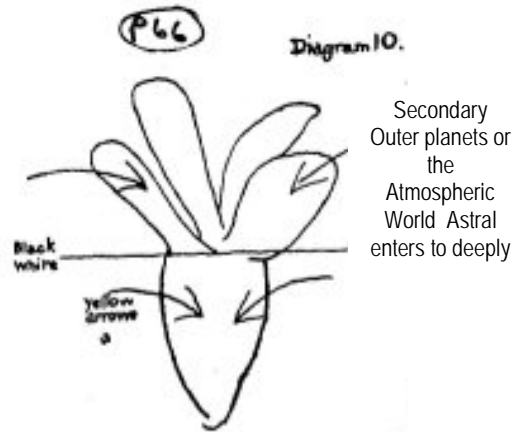
And now you will begin to guess that, if fungi arise from such a special astralizing process, the same process must take place from below upward when, as in human diphtheria, this remarkable astralization occurs in the human head. This is actually the case. Hence you find in diphtheria the tendency to fungoid formations. It is most important to consider this tendency to fungoid formations in diphtheria, and it will also show you that a truly occult process is taking place there. Everything external is really only a sign that irregular astral currents, of *Cosmic Substance from the metabolism towards the head*, are prevailing within the human being.

But when, as here, the processes work so deeply into the organism, much more will naturally be achieved by trying to find the specific remedy with which to oppose the particular process at work. One should try intermediate potencies of **cinnabar** - *Mercury Sulphate*. In cinnabar we will find effects that counteract all the phenomena I have mentioned. Cinnabar expresses this even in its outer appearance. If we acquire a sound understanding of such things we will recognize that cinnabar through its vermilion color is something that in a certain way brings to expression this activity opposed to the fungoid process. That which is approaching the colorless can become fungoid. While too strong an astralization of the earth's surface plays a part in the formation of fungi, in cinnabar there is a counter-reaction to this astralization and thus this reddening. *Mercury a brother of Zinc is an element that strengthens the Etheric within the Physical body and so pushes off a too strong astral working*. Wherever a reddening appears in natural processes, we find a powerful counter-effect to the astralization process. You could express this in a moral formula: “The rose in blushing works against astralization.” These domains of pathological-therapeutic study are really interconnected in a certain way. They guide us into this peculiar relationship of the ego and astral body to the other organs, to their laying hold of organs, to their emancipation from organs, or to manifestations of the excessive working of the astral from below upward *in the human, which for the plant is from above downwards*. (2)

This process is very similar to that occurring in some pest attacks.

Now I am going to tread on very thin ice and take an example very near home. I am going to talk about the nematode of the beetroot. The outer signs of this disease are a swelling of root fibers and limpness of the leaves in the morning. Now we must clearly realise the following facts: The leaves, the middle part of the plant which undergo these changes, absorb cosmic

substance influences that come from the surrounding air, whereas the roots absorb the *cosmic* forces which have entered into the earth and are reflected upwards into the plant. What, then, takes place when the nematode occurs? It is this: The process of absorption of *Cosmic Substance* which should actually reside in the region of the leaves has been pressed downwards and embraces the roots.



Thus if this (Diagram No. 10) represents the earth level, and this the plant, then in the plant infested with the nematode the *astralised Cosmic Substance* forces which should be active above the horizontal line are actually at work below it. What happens is that certain cosmic *substance* forces slide down to a deeper level; hence the change in the external appearance of the plant. But this also makes it possible for the parasite to obtain under the soil (which is its proper habitat) those *astralised cosmic substance* forces which it must have to sustain It (the nematode is a wire-like worm). Otherwise it would be forced to seek for these forces in the region of the leaves; this, however, it cannot do as the soil is its proper environment. Some, indeed all, living beings can only live within certain limits of existence. Just try to live in an atmosphere 70 degrees above or 70 degrees below zero and you will see what will happen. You are constituted to live in a certain temperature, neither above nor below it. The nematode is in the same position. It cannot live without earth and without the presence of certain cosmic *substance* forces brought down into it. Without these two conditions it would die out.

Every living being is subject to quite definite conditions. And for the particular beings with which we are dealing, it is important that cosmic forces should enter the earth, forces which would ordinarily display themselves only in the atmosphere around the earth. *If we change the energetic environment the pests and disease will go elsewhere.*

Animals

Now why do I say that the "agricultural-individuality" stands on its head?

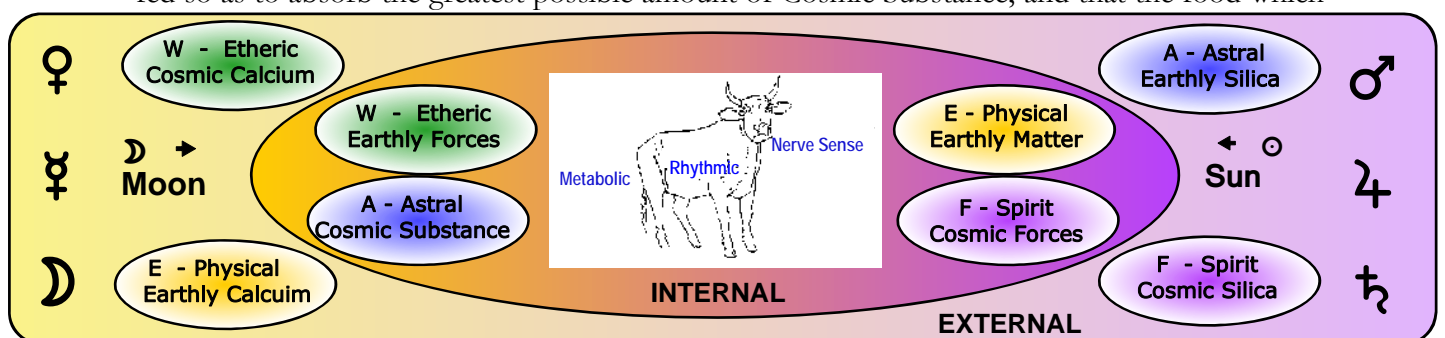
I do so because the air, vapours and warmth which are in the immediate neighbourhood of the soil and from which both man and the plants derive air, moisture and warmth - all this corresponds to the abdominal organs in the human body. On the other hand every thing that takes place within earth, under the soil, affects the general growth of plants in the same way as our head affects our organism - especially in childhood, but also throughout the whole of our life. Thus there is a constant and very living interplay of supra-terrestrial and sub-terrestrial activities.

To what I said about the "belly" being above the Earth and the "head" being under the Earth, belongs an understanding of *the internal workings within* the animal organism.

In the animal, the threefold organism is not so sharply defined as it is in man. The animal has a system of nerve and senses and a metabolic and limb system. These are clearly divided, the one from the other. But in many animals the limits of intermediate rhythmic system are indefinite; both nerves and senses system and metabolic system trespass upon the limits of the rhythmic system. We should therefore choose other terms when we speak of animals. In man one is quite right in speaking of a three-fold organism: but in the case of animals one ought to speak of the nerve and senses system as being localised primarily in the head, *and working backwards throughout the whole body*, and of the metabolic and limb system as being in the hind quarters and limbs but at the same time *working forwards* throughout the whole body. In the middle of the body the metabolism becomes more rhythmical as does also the nervous system, and there both flow into one another. The rhythmic system has a less independent existence in the animal. Rather the opposite poles become indistinct as they merge into one another. Drawing 15. We should therefore speak of the animal organism as being twofold, the extremes interpenetrating at the middle. In this way the animal organization arises.

Now *internally*, all the substances contained in the 'head' system - I am speaking of animals, but the same is true of man *and plants* - are of Earthly Substance. Even in the embryo, Earthly Substance is led into the head system. The embryo must be so organised that its head receives its matter from the earth. In the head, therefore we have Earthly Matter. But the substances which we bear in the metabolic and limb organisation, those which permeate our intestines, our limbs, our muscles and bones, etc., these substances do not come from the earth, but from what has been absorbed from the air and warmth above the Earth.- It is Cosmic Substance. This is important. When you see an animal's claw, you must not think of it as having been formed by the food which the animal has eaten and which has gone to the claw and been deposited there. This is not the case. It is cosmic matter taken up through the senses and the breathing. *The etheric aspect of* what the animal eats serves only to stimulate its powers of movement, so that the cosmic substance can be driven into the metabolic and limb organisation, and can be driven into the claw and similarly distributed throughout the whole organism.

With Forces (as opposed to Substances) it is the other way round. Because the senses are centred in the head and take in impressions from the cosmos, the Forces in the head are Cosmic in nature. To understand what happens in the metabolic and limb organisation, you need only think of walking, which means that the limbs are permeated with earthly gravity: the Forces are Earthly ones. Thus the limb system contains Cosmic Substances permeated by Earthly Forces. It is extremely important that the cow or the ox, if used for working, should be fed so as to absorb the greatest possible amount of Cosmic Substance, and that the food which



enters its stomach should produce the necessary *Earthly Force* strength to lead this Cosmic Substance into its limbs, muscles and bones. *Thus the Etheric inspired Earthly Forces provides an enlivening levity to the Cosmic Substances' drive to gravity.*

It is equally important to realise that the Earthly Substances in the head have to be drawn from the food, which has been worked upon in the stomach, and is led into the head. In this sense, the head relies upon the stomach in a way in which the big toe does not, and we must realise quite clearly that the head can only work upon this nourishment which comes to it from the metabolism, if it can at the same time draw in sufficient Cosmic Forces. If, therefore, animals instead of being left in stuffy stables where no cosmic forces can reach them, are led into meadows and given every opportunity of entering into relation with their environment through the perceptions of their senses, then we may see results such as appear in the following examples.

Imagine an animal standing in a dark and stuffy stable before its manger, the contents of which have been measured out by human "wisdom". Unless its diet is varied, as it only can be out-of-doors, this animal will show a very great contrast to one which seeks out its food with its sense of smell, guided by this organ in its search for Cosmic Forces, seeking and finding its nourishment by itself and developing its whole activity in doing so. An animal that is fed from a manger will not show immediately how devoid it is of Cosmic Forces, for it has inherited a certain amount of them. But it will breed descendants to whom these Cosmic Forces are no longer transmitted. Such an animal will become weak, beginning from the head, i.e. it will not be able to nourish its body because it cannot take in, the necessary cosmic substances which should come in. This will show you that it is not enough simply to say: "This kind of fodder for one case, that for another". Rather one must have a clear idea of the value for the animal's whole organisation that such and such methods of feeding have.

Cowhorns

Now following the trend, *we saw in compost*, we can take a further step. Have you ever wondered why it is that cows have horns, while certain other animals have antlers? It is a very important question. Yet what science has to say about it is quite one-sided and based on externals. Let us consider why cows have horns. I said that the forces within a living organism need not always be directed outwards, but can also be directed inwards. Now imagine an organic entity possessing these two sets of forces, but which is unformed and lumpish in build. The result would be an irregular, ungainly being. We should have curious looking cows if this were the case. They would all be lumpish and unformed, with rudimentary limbs as at an early embryonic stage. But this is not how a cow is constructed. A cow has horns and hoofs. Now what happens at the points where horns and hoofs grow? At these points an area is formed from which the organic formative forces, *moving outwards from the metabolism*, are reflected inwards in a particularly powerful way. There is no communication with the outside as in the case of the skin or hair; the horny substance *of the horn* blocks the way for these forces to the outside. This is why the growth of horns and claws has such a bearing upon the whole form of the animal.

Things are quite different in the case of antlers. Here the streams of forces, *coming from the metabolism* are not led back into the organism, but certain of them are guided for a short distance out of the organism; there must be valves, as it were, through which the streams localised in the antlers (we can speak of streams of 'force', just as we can speak of streams of air or liquid) can be discharged. A stag is beautiful because it stands in intense communication with its environment by reason of its sending outwards streams of *metabolic* forces; by this it lives within its environment and takes up from it everything which works organically in its nerves and senses. Hence the nervous nature of the stag. In a certain respect all animals which have antlers are suffused with a gentle nervousness. This is clearly to be seen in their eyes.

The cow has horns, in order to reflect inwards the astral *inspired cosmic substance* and etheric inspired earthly forces, *coming first from the metabolism*, which then penetrate right *back* into the metabolic system, so that increased activity in the digestive organism arises by reason of this radiation from horns and hoofs. If one wants to understand foot-and-Mouth disease, i.e. the retroaction from the periphery to the digestive tract, one must know of this connection. Our remedy for Foot-and-Mouth disease is based on the recognition of this. In the horn, therefore, we have something which by its inherent nature is fitted to reflect the living etheric and astral streams into the inner life organs. The horn is something which radiates etheric life and even the astral element. Indeed, if you were able to enter into the cows belly, you would smell the current of etheric-astral life which streams *back* from the horns: and the same thing is true of the hoofs.

Now this gives us a hint as to the measures we may recommend for increasing the effectiveness of ordinary stable manure. What is ordinary stable manure really? It is foodstuff which the animal has taken in and which up to a certain point has been assimilated by its organism, thereby stirring into activity certain dynamic forces in the organism. Its main use has not been to increase the amount of substance in the organism, for after having had its effect, it is excreted. It has become permeated with astral *cosmic substance* and etheric *earthly force* elements. The astral element has filled it with nitrogen-bearing forces and the etheric element with oxygen-bearing forces. The substance which emerges as dung is permeated with these forces. Imagine now: We take this substance and pass it into the soil in some form or other (the details will be dealt with later). Thus we add to the soil an etheric-astral element whose proper place is in the belly of the animal, where it produces forces of a plant-like nature. For the forces which we produce in our digestive tract are of a plant-like nature. We should be extremely thankful that we get such a residue as dung, for it carries etheric *earthly forces* and astral *cosmic substance* forces from the interior of the organism out into the open. These forces remain with it, and it is for us to keep them there. In this way the dung will act in a life-giving and also astralising way on the soil, not only on the water element in it, but especially on the solid element. It has the power to overcome what is inorganic in the earthly element. Now what is passed over to the soil will necessarily, of course, lose the form it originally had when taken in as food, for it has to go through an inner organic process in the metabolic system. There it enters upon a phase of decomposition and dissolution. But it is at its best just at the point where it begins to dissolve

through the workings of its own astral and etheric elements. It is then that the parasites, the micro-organisms make their appearance. They find a good feeding-ground in which to develop. This is why the theory arose that these parasites are themselves responsible for the virtues in the manure. But they are only indications of the condition of the manure. If we think that by inoculating the manure with these bacteria we shall radically improve its quality, we are making a complete mistake. Externally there may seem at first to be an improvement, but in reality there is none.

Animal Husbandry

Now, to go further: in any given region of the earth there is not only a particular vegetation but also certain animals live there. For reasons which will appear later on, we need not consider human beings for the moment. It is one peculiar fact, and I should be glad to see this put to experimental test as I am quite sure that such a test would confirm it. This fact is that the right quantities of cows, horses and other live-stock on a farm will supply just the necessary amount of manure for the farm to restore to it what has been discharged into "chaos". Moreover the right proportion of horses, cows and pigs will yield the right proportions in the mixture of manures. This is because the animals eat the right proportion of the plant substances yielded by the soil, and because in the course of their organic processes they produce as much manure as is needed to be given back to the soil. And, though it cannot be strictly carried out, I would say that manure of any kind introduced from outside can only be regarded as a curative substance for a farm that has become diseased.

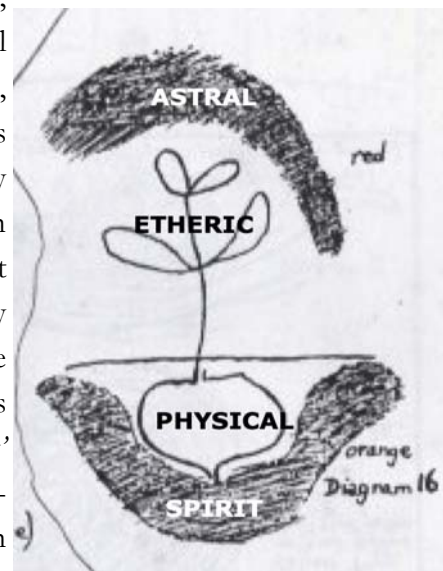
A farm is only healthy if it can supply itself from the manure yielded by its own animals. This of course entails the development of a real knowledge of how many animals of a given sort are necessary for a given farm. But this will be found out as soon as some knowledge returns to us of the inner forces in Nature. To what I said about the "belly" being above the Earth and the "head" being under the Earth, belongs an understanding of the animal organism.

Thus if we imagine ourselves to have picked up the animal, turned it round and set it upside down with its head in the earth we shall have the position invisibly taken by the "agricultural-individuality". The consideration of this formation of the animal enables us to see a relation between the manure produced by the animal and the needs of the earth in which the plants grow which serve as food for the animal. For you will remember that the cosmic forces which act in a plant are guided upwards through it from inside the earth. If, therefore, a plant is particularly rich in these cosmic forces, and an animal eats it, then the manure which this animal excretes will be particularly well-suited to the soil on which the plant grows. Thus if we learn to grasp the forms of things we shall see in what sense an agricultural unit, or farm is a "self-contained individuality" (or as we have called it an agricultural-individuality") only we have to include in it the necessary livestock.

But we must go a step further. What is actually - contained, in the Head? Earthly Substance. If you take out the brain, the noblest part of an animal, you will have before you a piece of

Earthly Substance. The human brain also contains Earthly Substance. But in both the Forces are Cosmic. What is the human brain for? It observes as a support for the Ego. The animal, let it be remembered, has as yet no Ego; its brain is only on the way to Ego-formation. In man it goes on and on to the complete forming of the Ego. How then did the animal's brain come into existence? Let us look at the whole organic process. All that which eventually manifests in the brain as earthly substance has simply been "excreted, *and deposited*, from the organic process. Earthly Substance has been excreted in order to serve as a base for the *Ego and Cosmic Forces*. Now the process of the working-up of the food in the digestive tract and metabolic and limb system produces a certain quantity of Earthly Substance which is able to enter into the head and to be finally deposited as Earthly Substance in the brain. But a portion of the food stuff is eliminated in the intestine before it reaches the brain. This part cannot be further transformed and is deposited in the intestine for ultimate excretion.

We come here upon a parallel which will strike you as being very paradoxical but which must not be over-looked if we wish to understand the animal and human organisations. What is brain matter? It is simply the contents of the intestines brought to the last stage or completion. Incomplete (premature) brain-excretion passes out through the intestines. The contents of the intestines, are in their processes, closely akin to the contents of the brain. One could put it somewhat grotesquely by saying that that which spreads itself out in the brain is a highly advanced dung-heap. And yet the statement is essentially correct. By a peculiar organic process, dung is transformed into the noble matter of the brain, there to become the foundation for the development of the ego. In man the greatest possible quantity of intestinal dung is transformed into cerebral excrement because man bears his ego on the earth. In animals the quantity is less. Hence there remain more forces in the intestinal excrement, of an animal which we can use for manuring. In animal manure, there is therefore more of the potential ego element, since the animal itself does not reach ego-hood. For this reason animal dung and human dung are completely different. Animal dung still contains ego-potentiality. In manuring a plant, we bring this ego-potentiality into contact with the plant's root. 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), *Cosmic Substances' parent*, is acquired from contact with the air, so the ego-potentiality (orange) *Cosmic Forces' parent*, develops below in the root through contact with the manure.

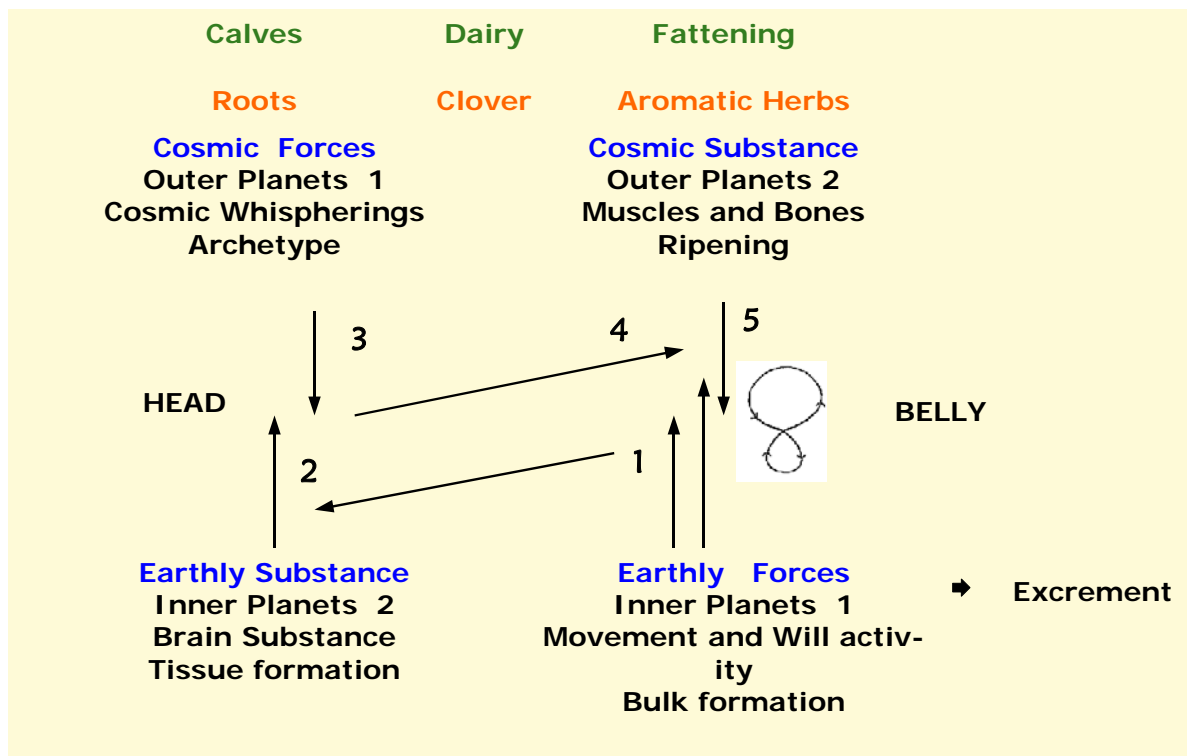


The farm is truly an organism. The astral element is developed above, and the presence of orchard and forest assists in collecting it. If animals feed in the right way on the things that grow above the earth, then they will develop the right ego-potentiality in the manure. If they produce, this ego-potentiality, it will work on the plant from the root, will cause it to grow

upwards from the root in the right way according to the forces or gravity. It is a wonderful interplay, but in order to understand it one must proceed step by step.

To begin with the root. The root generally develops in the soil and through the manure it becomes permeated with ego-potentiality which it absorbs. This absorption is determined and aided if the root can find in the right quantities salts in the soil around it. Let us assume that we are considering the nature of these roots merely from the point of view of the foregoing reflections. Then we shall suggest that roots are the food which, when it is absorbed into the human organism, will find its way most easily to the head by way of the digestive process. We shall therefore provide a diet of roots where we require to give the head material substances to enable the cosmic forces which work through the head to exercise their plastic activity. Now imagine someone saying to himself: "I must give roots to this animal which requires Earthly Substance in its head in order to stimulate its sense-connections with the cosmic environment". Does not this immediately suggest the calf and the carrot. A calf eating carrots portrays this whole process. The moment something like this is put forward and you know how things really are and their true connections, you will know immediately what is to be done. It is simply a matter of realising how this mutual process arises.

But let us proceed to the next stage. Once the calf has eaten the carrot, once the *Earthly Substance* really has been introduced into the head, the converse process must be able to begin, i.e. the head, on its part, must begin to work with forces of volition thus begetting within the organism *Cosmic Substance* forces which can be worked into it. It is not enough for the "carrot dung" to be deposited in the head; from what is deposited and in the course of disintegration, streams of force must come and enter the rest of the organism. In short, there must be a second food substance which will enable one part of the body which has already been fed (in this case the head) to work in the right way on the rest of the organism.



Well, I have given the animal the carrot fodder. And now I want the animal's body to be permeated with the forces of *Cosmic Substance*, which are *first* developed from the head. For this, as a second fodder, we need a plant with a spindly structure, the seed of which will have gathered into itself these "spindly" forces. We immediately think of flaxseed (linseed) or something similar. If you feed young cattle on carrots and linseed - or carrots and fresh hay (which is equally suitable) - this will bring into full operation the forces already, latent in the animals. We should therefore try to give young cattle food which promotes, on the one hand, the *Cosmic Forces* of ego-potentiality, and, on the other, the complementary streams of astral force working from above downwards as *Cosmic Substance*: For the latter purpose, those plants are especially suitable which have long, spindly stems and as such have been turned into hay. Just as we have looked into this concrete case, so we must approach Agriculture as a whole: of every single thing, we must know what happens to it when it passes either from the animal into the soil, or from the plant into the animal.

Now coming from the other direction, it is quite true that what one eats is important, but the greater part of it is not there for the purpose of being taken into the body and deposited there as substance. This greater part has to give over to the body the *Earthly Forces* which it contains in itself and thus stimulate the body into activity. The greater part of what is taken up as *food* substance in this way is eliminated again from the body. What matters, therefore is not whether a certain weight of matter in certain proportions undergoes digestion, but whether we are able to take up in the right way, with the food we eat, the active forces therein. For we need these active *Earthly Forces* when we walk or work, or even more when we use our arms. On the other hand, that which the body needs in order to fill up, to enrich itself, as it were, with substance (the substance being continually discarded and renewed during the course of every seven or eight years) is absorbed for the most part through the sense organs, the skin and the breathing, in a highly attenuated state, as *Cosmic Substance*, and only *then* becomes densified in the organism. The body absorbs it from the atmosphere, densifies and hardens it, so that for instance it can be cut off as hair and nails. The schematic formulation: "Food taken in, passage through the body, wearing away of the nails, peeling of the skin, etc" is quite wrong. It should run: "Breathing, highly rarefied absorption through the sense organs (even through the eyes), of *Cosmic Substance*, passage through the organism, excretion." What is absorbed through the digestion on the other hand as *Earthly Forces* becomes important because its "inner 'mobility" (Regsamkeit) is set free, just as when fuel is burned. It introduces into the body those forces which open the way for the will to act in the body. If these things are to be rightly handled, it is necessary to gain insight into the mode of activity of substances (*physical*), and forces (*etheric*), the dynamic (*astral*) and of the spiritual too in every part of agriculture. A child who does not know what a comb is for, will bite into it or otherwise misuse it. In the same way we shall make quite a wrong use of things if we do not understand their essential being and their specific functions.

Dairy Cattle

Let us pursue the subject yet further. Let us take the case of an animal which should become particularly strong in the middle region (where the head or nervous organisation tends to develop in the direction of breathing and the metabolic organisation tends to have a rhythmic character). Which animals have to be strong in this particular region? They are the milch animals. The secretion of milk shows that the animal in question is strong in this region. The point to observe here is that the right co-operation should take place between the (*Sun*) current going from the head backwards (mainly a streaming of forces) and the (*Moon*) current going from the animal's hind-quarters forward (mainly a streaming of substance.) If these two currents co-operate and intermingle in the right way, the result will be an abundant supply of rich milk. For good milk contains substances prepared in the metabolic system and which, without having entered into the sexual system, have become akin to it. It is a sexual process within the metabolic system. Milk is simply a sexual secretion on another level. It is a substance, which, on its way to becoming sexual secretion, is penetrated and transformed by the forces working from the head. The whole process can be seen quite clearly.

Now for processes which should arise in this way, we must choose a diet which will work less powerfully towards the head than do roots which contain ego-potentiality; neither may the diet, since it is to be connected with the sexual system, contain too much of the astral element, i.e. of that which goes towards the blossom and fruit of the plant. In short, if we wish to find a diet that will produce milk, we must choose the part of the plant which lies between blossom and root, i.e. the green and leafy part. If we wish to bring about an increase in the milk supply of an animal whose milk production we have reason to believe could be increased we shall certainly reach the desired end if we proceed as follows: Suppose I have a cow and feed it with green fodder. I take plants in which the process of fruit-formation has been developed within the process of leaf-formation. Such, for example, are the pod-bearing or leguminous plants and especially the clovers. In clover, the would-be fruit develops as leaf and foliage. A cow that is fed in this way will perhaps not show much result of it; but when the cow comes to calve, the calf will grow into a cow that yields good milk. The effects of reformed foddering usually need a generation in which to show themselves.

Suppose now that we wish to consider the flowering and fruiting part of the plant. And we must go further, and observe what is fruit-like in the rest of the plant. This recalls a feature of plant-life that always delighted Goethe, namely the fact that the plant has throughout its whole body the tendency towards what is normally specialised at certain parts. With most plants we take the seed which has formed from the blossom and place it in the earth in order to produce more plants. But we do not do this in the case of the potato. Here we use the eyes of the tubers. This is the fruiting part of the potato plant, but, like many processes in Nature, it is not carried out to the end. We can, however, heighten its activity by a procedure which bears an external resemblance to combustion. For instance, if you "cossette" (chop up into thin straws) roots or tubers and dry the "cossettes" for fodder, the stuff will be enormously strengthened in

its activity and brought a stage nearer to the fruit stage if you spread it out in the sun and allow it to steam a little.

QUESTION: What does Spiritual Science say on the subject of preserving foodstuffs by acidification in general?

ANSWER: If we use salt-like materials at all in this process it does not make much difference whether the salt is added at the moment of eating, or whether it is used in the preparation of the fodder. In the case of fodder that contains too little salt to carry the food stuffs to those parts of the organism where they should work, souring is the right procedure to adopt. Take the case of turnips. These, as we saw, are particularly fitted to work upon the head-organisation. They are, therefore, an excellent food for certain animals, especially for young cattle. If, however, it be noticed that the young animals shed their hair too soon and too much, their fodder should be salted because this means that the food is not being deposited in sufficient quantities in those parts of the organism where it is needed. Salt is tremendously effective in carrying food to the part of the organism where it is needed and will work.

QUESTION: What view does Spiritual Science take on the subject of souring of the leaves of sugar-beet and other green plants?

ANSWER: The great thing here is to find a certain optimum and not go beyond it by adding too much salt, because salt is the part of food which more than any other remains what it is once it is inside the organism. The organism in general, in the case of animals and even more so of human beings, is so constructed as to submit everything it absorbs to the most varied changes. It is an error to think that the albumen which goes into our stomachs remains the same as it was before we ate it. It must first be changed into a completely lifeless substance and then changed back again by means of the etheric body into specifically human (or in the case of animals specifically animal) albumen.

Everything that enters into an organism must be changed. This applies even to warmth. Suppose that this (see Diagram 25, Part I) is a living organism and this the warmth in the environment. Now assume you have a piece of dead wood (Diagram 25, Part II) which, it is true, comes from a living organism but is already dead. It is likewise surrounded by warmth. Now when the warmth enters into the living organism, it does not simply go a little way in and remain what it is; the organism immediately transforms it into a warmth of its own, and it could not do otherwise. Whereas when the warmth penetrates into the dead wood it remains exactly the same kind of warmth as exists outside in the mineral earth. The moment warmth penetrates into us unchanged as it does into the piece of wood, we catch cold. Nothing that comes into the living organism from outside may remain what it is* it must immediately be changed into something else. This process takes place to the least extent in salt. No great harm, therefore, will be done by using salt for the preserving of food-stuffs so long as you do it carefully and do not put in too much. The mere sense of taste will reject it. If it is necessary for the preservation of food-stuffs this shows that up to a point it is the right process to adopt.

QUESTION: Do you recommend souring fodder without salt?

ANSWER; That is too advanced a process. It is a super-organic process (self-fermentation) and can in certain circumstances be extremely harmful.

Cooking

Practices like this are based upon a deep and wonderful instinct. We can ask: how did men first come to cook their food? Men began to cook their food because they gradually discovered that what develops during fruit formation is mainly due to processes akin to cooking, viz. burning, warming, drying and evaporating. All these processes tend to make the fruit and seed and indirectly "the other parts of the plant, especially the higher parts, more fitted to develop the forces that are necessary to the metabolic and limb system in the animal. Even uncooked the blossom and fruit of a plant work on the animal's metabolic and digestive system and primarily through the forces they develop, not through their substance. For it is the forces of the earth which are needed by the metabolic and limb system, and in the measure in which it needs them, it must receive them. Take the case of the animals which pasture on steep mountain sides. Unlike those in the plains, they climb about under difficult conditions owing to the fact that the ground is not level. There is all the difference for those animals between level and slanting ground. They require food that will develop those forces in limb and muscle which are energised by the will. Otherwise they would not be good for either labour, milking or fattening. It is therefore important that they should eat plenty of those aromatic mountain plants in which blossom and fruit have undergone an additional treatment by the sun, resembling a process of natural cooking.

But similar results can be achieved and strength given to muscle and limb by artificial methods - roasting and boiling, etc. Flower and fruit are most suitable for this, especially of those plants which, from the beginning develop towards fruiting and do not waste their time, as it were, in growing foliage.

Fattening Animals

This brings us to the question of the fattening of animals. Here we must say we should regard the animal as a kind of sack to be filled as full as possible with Cosmic Substance, *supported by Earthly Forces*. A fat pig is really a most heavenly animal! It's fat body, apart from its system of nerves-and-senses, is made up entirely of cosmic, not of earthly substance. The pig needs the food which it enjoys so much in order to fill itself with cosmic substance, which it absorbs on all sides and then distributes throughout its body. It must take in this substance which has to be drawn from the cosmos, and distribute it. And the same is true of all fattened animals. You will find that animals will fatten best on the part of the plant which tends towards fruit-formation, and has been heightened in its activity by cooking or steaming. Or, if you give them something which has in it an enhanced fruit-process, for instance turnip, which belongs to a species in which this process has been enhanced and which has become larger through long cultivation. In general, the best kind of food for fattening cattle is that which will at least help to distribute the cosmic substance, i.e. the part of the plant which tends to fruit-formation - and which has

in addition received the proper treatment. These conditions are in the main fulfilled by certain kinds of oil cakes and the like. But we must also see to it that the animal's head is not entirely neglected and that in this fattening treatment a certain amount of earthly substance is introduced there. The fodder just mentioned needs to be complemented by something for the head, though a smaller quantity, as the head does not require so much. In fattening an animal, we should therefore add a small quantity of roots.

Now there is a substance which as substance has no particular function in the organism. In general, one can say that roots have a function in connection with the head, blossoms in connection with the metabolic and limb system, and leaf and stem in connection with the rhythmic system within the human organism. There is, now, a substance that can aid the whole animal organism, because it is related to all its members. This substance is salt. And as of all the ingredients in the food of both human and animals, salt is the least in quantity, we can see it is not how much we take which matters, but what we take. Even small quantities of substance will fulfill their purpose if they are of the right kind.

The essential thing about nourishment is that forces should be developed in the body. Whether the animal develops enough forces to enable it to take in and transform the substances in the atmosphere depends upon whether it absorbs its food in the right way. To make a comparison. If you want to put on a close-fitting glove you don't do it by squeezing your fingers into it. You first enlarge the glove with a stretcher. In the same way we must bring elasticity into those forces which are to take out of the atmosphere what is not produced by food. Through the food the organism is stretched and thereby enabled to take in more of what it needs from the atmosphere. This may even lead to hypertrophy if too much food is taken in. This has to be paid for by a shortened life span. The middle course must be found between the maximum and minimum. (1)

Further Considerations

What here plays in — the fact that man feels himself as a being constituted in the way I have described — this at first remains for the ordinary consciousness of today below in the unconscious. There, certainly, it is already present; and there it emerges as a kind of mood, a kind of life-mood of man. But it is spiritual vision alone that brings it to full consciousness, and I can only describe this spiritual vision to you thus: The man who knows from present-day initiation-science this secret of the human being, namely that the head is the most important, the most essential organ which needs *Earthly* substance with *Cosmic* forces; who knows further that the most essential thing in the system of limbs and metabolism is *Cosmic* substance which needs *Earthly* forces — the forces of gravity, of balance, and the other *Earthly* forces in order to exist; who can thus penetrate with spiritual vision into this secret of the human being and who then turns his gaze back to this human, earthly existence — this man must acknowledge himself as a tremendous debtor to the world. For he must admit that in order to maintain his human existence he requires certain conditions; but through these very conditions he becomes a debtor to the earth. He is continually withdrawing something from the earth. And he finds himself

obliged to say that the *Cosmic* substance, which as man he bears within himself during earthly existence, is actually needed by the earth. **When man passes through death, he should in fact leave this *Cosmic* substance behind him for the earth,** for the earth continually needs *Cosmic* substance for its renewal. But this man cannot do, for he would then be unable to traverse his human path through the period after death. He must take this *Cosmic* substance with him for the life between death and a new birth; he needs it, for he would disappear, so to speak, after death, if he did not take this *Cosmic* substance with him. *Cosmic Substance is the dross of man's Astral body as he has moved through life.*

Only by carrying this *Cosmic* substance of his limb-metabolic system through the gate of death can man undergo those transformations which he must there undergo. He would be unable to meet his future incarnations if he were to give back to the earth this *Cosmic* substance which he actually owes to it. He cannot do this. He remains a debtor. And this is something which there is no means of bettering as long as the earth remains in its middle period. At the end of earth-existence things will be otherwise.

It is indeed the case, my dear friends, that one who beholds life with Cosmic vision has not only those sufferings and sorrows — perhaps also that happiness and joy — which are offered by ordinary life, but, with the beholding of the *Cosmic*, cosmic feelings, cosmic sufferings and joys, make their appearance. And initiation is inseparable from the appearance of such cosmic suffering as, for example, the fact that one has to admit: Simply because I must maintain my humanity I must make of myself a debtor to the earth. I cannot give to the earth what I really should give if, in a cosmic sense, I were to act with complete rectitude.

Matters are similar as regards the substance which is present in the head. Because throughout the entire course of earth-life *Cosmic* forces are working in the Earthly substance of the head, this head-substance becomes estranged from the earth. Man must take away from the earth the substance for his head. But he must also, in order to be man, continually imbue this substance of his head with extra-terrestrial *Cosmic* forces. And when the human being dies, this is something extremely disturbing to the earth, because it must now take back the substance of the human head which has become so foreign to it. When the human being passes through the gate of death and yields up his head-substance to the earth, then this head-substance — which is entirely *Cosmicized*, which bears within itself what results from the *Cosmic* — does in fact act as a poison, as a really disturbing element, in the totality of the life of the earth. When man sees into the truth of these matters, he is obliged to say to himself that the honest thing would be to take this substance with him through the gate of death, for it would in fact be much better suited to the spiritual region which man traverses between death and a new birth. He cannot do this. For if man were to take this *Cosmicized* earth-substance with him, he would continually create something adverse to all his development between death and a new birth. It would be the most terrible thing that could happen to man if he were to take this *Cosmicized* head-substance with him. It would work incessantly upon the negation of his spiritual development between death and rebirth.

One must therefore acknowledge, when one sees into the truth of these things, that here, too, man becomes a debtor to the earth; for something for which he is indebted to the earth but has made useless for it, this he must continually leave behind, he cannot take it with him. What man should leave for the earth he takes from it; what man should take with him, what he has made useless for it, this man gives over to the earth with his earthly dust, thus causing the earth immense suffering in its entire life, in its whole collective being.

It is indeed the case that at first, just through spiritual vision, something weighs heavily upon the human soul, something like a tremendous feeling of tragedy. And only when one surveys wider epochs of time, when one beholds the development of entire systems, only then is the prospect revealed that, when the earth will have approached its end, in later stages of human evolution — in the Jupiter, Venus, Vulcan stages — will man be able to restore the balance, to annul the debt.

Thus it is not only by passing through the experiences of a single life that man fashions karma, but man creates karma, world karma, cosmic karma, just through the fact that he is an earthly human being, that he is an inhabitant of the earth, and draws his substance from the earth.

Here it is possible to look away from man, to look towards the rest of nature and see how — though man must burden himself with the debt of which I have just told you — balance is nevertheless continually restored by cosmic beings. And here one penetrates into wonderful secrets of existence, into secrets which, when taken in conjunction with each other, become something from which one can first gain a conception of the wisdom of the world.

Let us turn our gaze away from man and towards something which has claimed much of our attention during the last few days, let us turn our gaze to the world of the birds, represented for us by the eagle. We spoke of the eagle as the representative of the bird-world, as the creature which synthesizes the characteristics and forces of the bird-kingdom. When we consider the eagle, we are in fact considering, in their cosmic connection, all the attributes which prevail in the bird-world as a whole. In future, therefore, I shall simply speak of ‘the eagle’

I have told you how the eagle actually corresponds to the head of man, and how those *Cosmic* forces which give rise to thoughts in the human head give rise in the eagle to his plumage. So that the sun-irradiated forces of the air, the light-imbued forces of the air, are actually working in the eagle's plumage.

This is what shimmers in the eagle's plumage — the light-irradiated power of the air.

Now the eagle — to whom many bad qualities may certainly be ascribed — does nevertheless possess, as regards his cosmic being, the remarkable attribute that outside his skin, in the structure of his plumage, everything is retained which is formed in it by the sun-irradiated forces of the air. What takes place here is, in fact, only to be noticed when the eagle dies.

For it is only when the eagle dies that one becomes aware of what a remarkable superficial digestion he has compared with the thorough-going digestion of the cow, with its process of chewing the cud. The cow is really the animal of digestion — again as representative of many

creatures of the animal kingdom. Here digestion is thoroughly performed. The eagle, like all birds, digests in a superficial way; the business of digestion is only begun. In the eagle, compared with his whole existence, digestion is merely a subsidiary process and is treated as such. On the other hand, everything in the eagle which has to do with plumage proceeds in a thorough way. (In the case of some other birds this is even more so.) Everything to do with the feathers is worked out with immense care. Such a feather is indeed a wonderful structure. Here we find most strongly in evidence what may be called earthly *substance*, which the eagle has taken from the earth, *Cosmicized* by the forces of the heights, but in such a way that the eagle does not assimilate it; for the eagle makes no claim to reincarnation. He need not, therefore, be troubled about what is being brought about in the earthly *substance* of his plumage through the *Cosmic* forces of the heights; he need not be troubled about how this works on in the spiritual world.

Now, when the eagle dies and his feathers fall into decay — as already mentioned this holds good for every bird — the *Cosmicized* earthly substance ascends into spirit-land and becomes changed back into *Cosmic* substance.

You see we have a remarkable relative interplay as regards the relationship of our head to the eagle. What we cannot do, the eagle can; he can continually conjure forth from the earth what becomes *Cosmicized* in the earth through *Cosmic* forces working on earthly substance.

This, too, is why we experience such a remarkable sensation when we observe an eagle in its flight. We feel him as something foreign to the earth, something which has more to do with the heavens than with the earth, although he draws his substance from the earth. But how does he do this? He obtains his substance in such a way that, as regards the earth, he is just a robber. For according to what may be called the ordinary, commonplace law of earth-existence no provision was made for the eagle to get anything. He becomes a robber; he steals his substance, as is done in all sorts of ways by the bird-kingdom as a whole. But the eagle restores the balance. He steals his material substance, but allows it to be *Cosmicized* by the forces which exist as *Cosmic* forces in the upper regions; and after death he carries off into spirit-land those *Cosmicized* earth-forces which he has stolen. With the eagles the *Cosmicized* earth-substance withdraws into spirit-land.

Now the life of animals also does not come to an end when they die. They have their significance in the universe. And the eagle in flight is only a symbol of his real being. He flies as Earthly eagle — Oh, but he flies further after his death! The *Cosmicized* Earthly *substance* of the eagle nature flies into the universe in order to unite itself with the *Cosmic* substance of spirit-land.

You see what wonderful secrets of the universe one comes upon when one enters into the reality of these things. Only then does one really learn why the various animal and other forms of the earth are there. They all have their great, their immense significance in the whole universe.

And now let us turn to the other extreme, to something which we have also studied during these days, let us turn to the cow, so venerated by the Hindu. There we have the opposite

extreme. Just as the eagle is very similar to the head, so is the cow very similar to the human digestive system. The cow is the animal of digestion. And, strange as it sounds, this animal of digestion consists essentially of *Cosmic* substance into which the *Earthly substance* consumed is merely scattered and diffused. **In the cow is the *Cosmic* substance and everywhere the *Earthly* substance penetrates into it, and is absorbed, made use of by the *Cosmic* substance.** It is in order that this may happen in a really thorough way that the process of digestion in the cow is so comprehensive, so fundamental. It is really the most fundamental digestive process that can be conceived, and in this respect — if I may put it so — the cow fosters what is fundamental to animal nature more thoroughly than any other animal in the absolute sense. She actually brings animal-nature — this animal egoism, this animal egoity — out of the universe down on to the earth, down into the region of earth-gravity.

No other animal has the same proportion between the blood-weight and the entire body-weight as the cow; other animals have either less or more blood than the cow in proportion to the weight of the body. And weight has to do with gravity and the blood with egoity; not with the ego, for this is only possessed by man, but with egoity, with separate existence. The blood also makes the animal, animal — the higher animal at least. And I must say that the cow has solved the world-problem as to the right proportion between the weight of the blood and the weight of the whole body — when there is the wish to be as thoroughly animal as possible.

You see, it was not for nothing that the ancients called the zodiac ‘the animal circle’. The zodiac is twelvefold; it divides its totality into twelve separate parts. Those forces, which come out of the cosmos, from the zodiac, take on form and shape in the animals. But the other animals do not conform to the zodiacal proportion so exactly. The cow has a twelfth part of her body-weight in the weight of her blood. With the cow the blood-weight is a twelfth part of the body-weight; with the donkey only the twenty-third part; with the dog the tenth part. All the other animals have a different proportion. In the case of man the blood is a thirteenth of the body-weight.

You see, the cow has seen to it that, in her weight, she is the expression of animal nature as such, that she is as thoroughly as possible the expression of what is cosmic. A fact I have mentioned repeatedly during these days — namely that one sees from the astral body of the cow that she actually manifests something lofty in *Earthly*-material substance — this comes to expression of itself through the fact that the cow maintains the partition into twelve in her own inner relationships of weight. The cosmic in her is at work. Everything to do with the cow is of such a nature that the forces of the earth are working into *Cosmic* substance. In the cow earth-heaviness is obliged to distribute itself according to zodiacal proportion. Earth-heaviness must accommodate itself to allow a twelfth part of itself to fall away into egoity. What the cow possesses as *Cosmic* substance has necessarily to enter into earthly conditions.

Thus the cow, lying in the meadow, is in actual fact *Cosmic* substance, which earth-*substance* takes up, absorbs, makes similar to itself.

When the cow dies, this *Cosmic* substance which the cow bears within herself can be taken up

by the earth, together with the earthly *substance*, for the well-being of the life of the whole earth. And man is right when he feels in regard to the cow: You are the true beast of sacrifice, for you continually give to the earth what it needs, without which it could not continue to exist, without which it would harden and dry up. You continually give *Cosmic* substance to the earth, and renew the inner mobility, the inner living activity of the earth.

When you behold on the one hand the meadow with its cattle, and on the other hand the eagle in flight, then you have their remarkable contrast: the eagle who, when he dies, carries away into the expanses of spirit-land that earth *substance*, which — because it is *Cosmicized* — has become useless for the earth; and the cow, who, when she dies, gives to the earth *cosmic* matter and thus renews the earth. The eagle takes from the earth what it can no longer use, what must return into spirit-land. The cow carries into the earth what the earth continually needs as renewing forces from spirit-land.

Here you become aware of something like an upsurging of feelings and perceptions from out of initiation-science. It is usually believed about this initiation-science, well, that one certainly studies it, but that it results in nothing but concepts, ideas. One fills one's head with ideas about the super-sensible, just as one otherwise fills one's head with ideas about the things of the senses. But this is not how it is. Penetrating ever further into this initiation-science, we reach the point of drawing forth from the depths of the soul feelings and perceptions, the existence of which we formerly did not even surmise, but which nevertheless are there unconsciously in every human being; we reach the point of experiencing all existence differently from the way we experienced it before. And so I can describe to you an experience which actually belongs to the living comprehension of spiritual science, of initiation science. It is an experience which would make us acknowledge that if man alone were upon the earth, we should — if we recognize his true nature — have to despair of the earth ever receiving what it needs, namely, that at the right time *Cosmicized substance* should be withdrawn and spirit-substance bestowed. We should have to experience an opposition between man and the being of the earth, which causes great, great pain, and causes that pain because we have to admit that, if man is to be rightly man upon the earth, the earth cannot be rightly earth because of man. Man and earth have need of each other, but man and earth cannot mutually support each other. What the being of the one requires is lost to the other; what the other needs is lost to the one. And we should have no security as regards the life-relationship between man and earth, were it not that the surrounding world enables us to say: What the human being is unable to achieve as regards the carrying of *Cosmicized earth-substance* over into spirit-land, this is accomplished by the bird-kingdom; and what man is unable to do as regards giving *Cosmic* substance to the earth, this is accomplished by the animals which chew the cud, as represented by the cow.

In this way, you see, the world is rounded into a whole. If we look only at man, uncertainty enters our feelings as regards the being of the earth; if we look at what surrounds man our feeling of certainty is restored.

And now you will wonder even less that a religious world-conception, which penetrates so

deeply into the spiritual as does Hinduism, venerates the cow, for she is the animal which continually spiritualises the earth, which continually gives to the earth that *Cosmic* substance which she herself takes from the cosmos. And we must learn to accept as actual reality the picture that, beneath a grazing herd of cattle, the earth below is quickened to joyful, vigorous life, that there below the elemental spirits rejoice, because they are assured of their nourishment from the cosmos through the existence of the creatures grazing above them. And we would have to make another picture of the dancing, rejoicing airy circle of the elemental spirits hovering around the eagle. Then again one would portray spiritual realities, and in the *Cosmic* realities one would see the *Earthy*; one would see the eagle extended outwards in his aura, and playing into the aura the rejoicing of the elemental air-spirits and fire-spirits of the air.

And one would see that remarkable aura of the cow, which so strongly contradicts her earthly nature, because it is entirely cosmic; and one could see the lively merriment in the senses of the elemental earth-spirits, who are thus able to perceive what has been lost to them because they are sentenced to live out their existence in the darkness of the earth. For these spirits what here appears in the cows is sun. The elemental spirits, whose dwelling place is in the earth, cannot rejoice in the Earthly sun, but they can rejoice in the astral bodies of the animals which chew the cud.

For, indeed, if one looks upon the world as these one cannot avoid the conclusion that eagles in their flight have no purpose, apart from the fact that they can be used in making armorial crests; cows are Earthly useful because they give milk, and so on. But because man also is regarded only as a Earthly being, he only possesses Earthly usefulness; and all this has no meaning for the world as a whole.

If people are unwilling to go further than this, they will certainly not reach the level where a world-meaning can appear; we must pass on to what the *Cosmic*, to what initiation-science can say to us about the world; then we shall certainly discover the meaning of the world. Then we shall find this meaning of the world as we discover wonderful mysteries in all existence — mysteries such as that which unfolds itself in connection with the dying eagle and the dying cow; and there between them the dying lion, which in his turn so holds *Cosmic* substance and *Earthy* substance in balance within himself, through the harmony he establishes in the rhythm of breathing and of blood, that it is he who regulates, through his group-soul, how many eagles are necessary, and how many cows are necessary, to enable the correct process both upwards and downwards to take its course in the way I have described to you.

You see, the three animals, eagle, lion, ox or cow, they were created out of a wonderful intuitive knowledge. Their connection with man is imbued with feeling. For the human being, when he sees into the truth of these things, must really admit: The eagle takes from me the tasks which I myself cannot fulfil through my head; the cow takes from me the tasks which I myself cannot fulfil through my metabolism, through my limb system; the lion takes from me those tasks which I myself cannot fulfil through my rhythmic system. And thus from myself and the three animals something complete is established in the cosmos.

Thus one lives one's way into cosmic relationships. Thus one feels the deep connections in the world, and learns to know how wise are those powers which hold sway in the world of being into which man is woven, and which live and move around him.

In this way, you see how we were able to weld together into a whole the diverse matters which came to our knowledge when we sought to discover man's connection with the three animal representatives about whom we have spoken in recent weeks. personalities do, (9)

These lectures deal with the inner connection between appearance and reality in the world, and you have already seen that there are many things of which those whose vision is limited to the world of appearance have no idea. We have seen how every species of being — this was shown by a number of examples — has its task in the whole nexus of cosmic existence. Now today, as a kind of recapitulation, we will again consider what I said recently about the nature of several beings and in the first place of the butterfly. In my description of this butterfly nature, as contrasted with that of the plants, we found that the butterfly is essentially a being belonging to the light — to the light in so far as it is modified by the forces of the outer planets, of Mars, of Jupiter, and of Saturn. Hence, if we wish to understand the butterfly in its true nature, we must in fact look up into the higher regions of the cosmos, and must say to ourselves: These higher cosmic regions endow and bless the earth, with the world of the butterflies.

The bestowal of this blessing upon the earth has an even deeper significance. Let us recall how we had to say that the butterfly does not participate in what is directly connected with earthly existence, but only indirectly, in so far as the sun, with its power of warmth and light, is active in this earthly existence. Actually a butterfly lays its eggs only where they do not become separated from sun activity, so that the butterfly does not entrust its egg to the earth, but only to the sun. Then out creeps the caterpillar, which is under the influence of Mars-activity, though naturally the sun influence always remains present. Then the chrysalis is formed, and this is under the influence of Jupiter-activity. Out of the chrysalis emerges the butterfly, which can now in its iridescent colours reproduce in the earth's environment the luminous Sun-power of the earth united with the power of Saturn.

Thus in the manifold colours of the butterfly world we see, in the environment of earth-existence, the direct working of Saturn-activity within the sphere of the earthly. But let us bear in mind that the substances necessary for earth-existence are in fact of two kinds. We have the purely material substances of the earth, and we have the *Cosmic* substances; and I told you that the remarkable thing about this is that in the case of man the underlying substance of his metabolic and limb system is *Cosmic* whereas that of the head is *Earthly*. Moreover in man's lower nature *Cosmic* substance is permeated with the activity of *Earthly* forces, with the action of gravity, with the action of the other earthly forces. In the head, the earthly substance, conjured up into it by the whole digestive process, the circulation, nerve-activity and the like, is permeated by super-sensible *Cosmic* forces, which are reflected in our thinking, in our power of forming mental pictures. Thus in the human head we have *Cosmicized Earthly substance*, and in the metabolic-limb-system we have earthized — if I may coin a word — earthized *Cosmic*

substantiality.

Now it is this *Cosmic substance* that we find to the greatest degree in the butterfly. Because a butterfly always remains in the sphere of sun-existence, it only takes to itself earthly matter — naturally I am still speaking pictorially — as though in the form of the finest dust. It also derives its nourishment from those earthly substances which are worked upon by the sun. It unites with its own being only what is sun-imbued; and it takes from earthly substance only what is finest, and works on it until it is entirely *Cosmicized*. When we look at a butterfly's wing we actually have before us earthly *substance* in its most *Cosmicized* form. Through the fact that the matter of the butterfly's wing is imbued with colour, it is the most *Cosmic* of all earthly substances.

The butterfly is the creature which lives entirely in *Cosmicized* earth-matter. And one can even see spiritually how in a certain way a butterfly despises the body which it carries between its coloured wings, because its whole attention, its whole group-soul being, is centred on its joyous delight in the colours of its wings.

And just as we marvel at its shimmering colours as we follow it, so also can we marvel at its own fluttering joy in these colours. This is something which it is of fundamental importance to cultivate in children, this joy in the spirituality fluttering about in the air, which is in fact fluttering joy, joy in the play of colours. The nuances of butterfly-nature reflect all this in a wonderful way: and something else lies in the background as well.

We were able to say of the bird — which we regarded as represented by the eagle — that at its death it can carry *Cosmicized* earth-substance into the spiritual world, and that thereby, as bird, it has the task in cosmic existence of *Cosmicizing* earthly matter, thus being able to accomplish what cannot be done by man. The human being also possesses in his head earth-matter which has been to a certain degree *Cosmicized*, but he cannot take this earthly matter into the world in which he lives between death and a new birth, for he would continually have to endure unspeakable, unbearable, devastating pain, if he were to carry this *Cosmicized* earth-matter of his head into the *Cosmic* world.

The bird-world, represented by the eagle, can do this, so that thereby a connection is actually created between what is earthly and what is extra-earthly. Earthly matter is, as it were, gradually converted into spirit, and the bird-creation has the task of giving over this *Cosmicized* earthly matter to the universe. One can actually say that, when the earth has reached the end of its existence, this earth-matter will have been *Cosmicized*, and that the bird-creation had its place in the whole economy of earthly existence for the purpose of carrying back this *Cosmicized* earth-matter into spirit-land.

It is somewhat different with butterflies. The butterfly *Cosmicizes* earthly *substance* to an even greater degree than the bird. The bird after all comes into much closer contact with the earth than does the butterfly. I will explain this in detail later. Because the butterfly never actually leaves the region of the sun, it is in a position to *Cosmicize* its *substance* to such a degree that it does not, like the bird, have to await its death, but already during its life it is continually

restoring *Cosmic substance* to the environment of the earth, to the cosmic environment of the earth.

Only think of the magnificence of all this in the whole cosmic economy! Only picture the earth with the world of the butterflies fluttering around it in its infinite variety, continually sending out into world-space the *Cosmicized* earthly *substance* which this butterfly-world yields up to the cosmos! Then, with such knowledge, we can contemplate the region of the world, of the butterflies encircling the earth with totally different feelings.

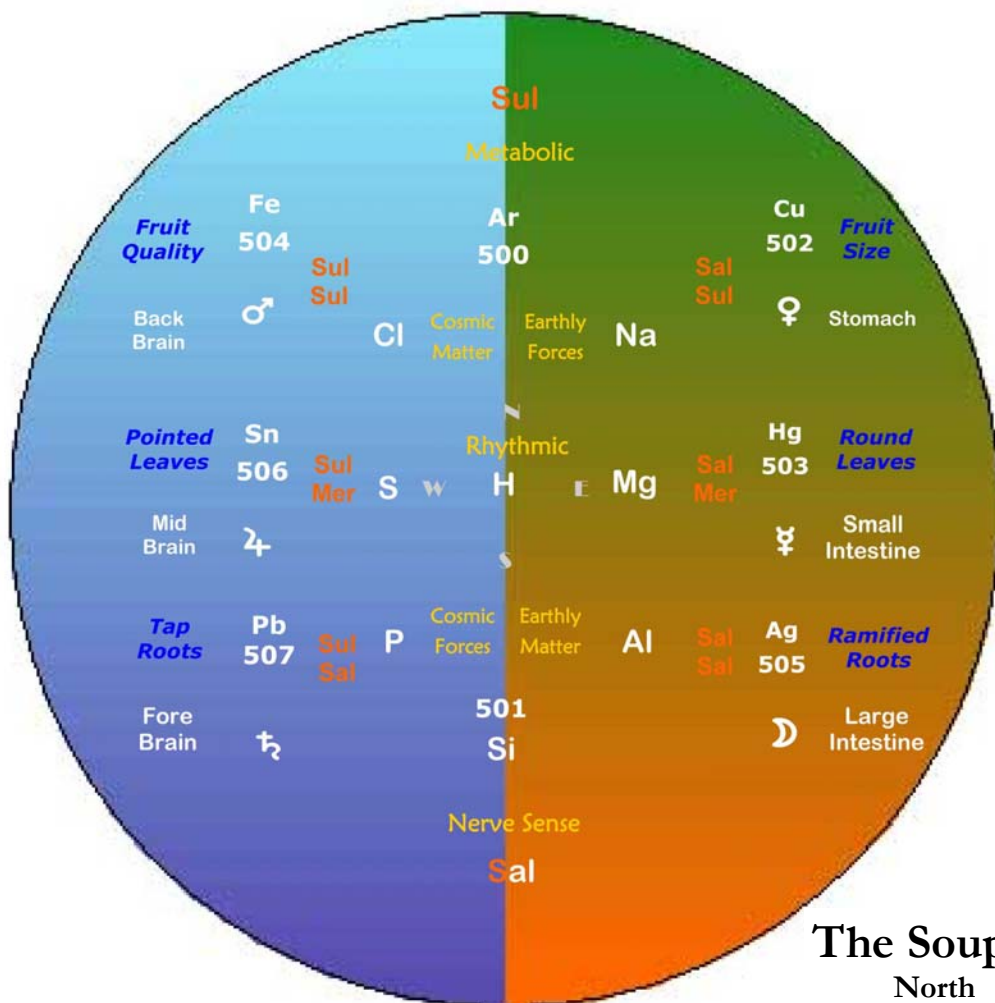
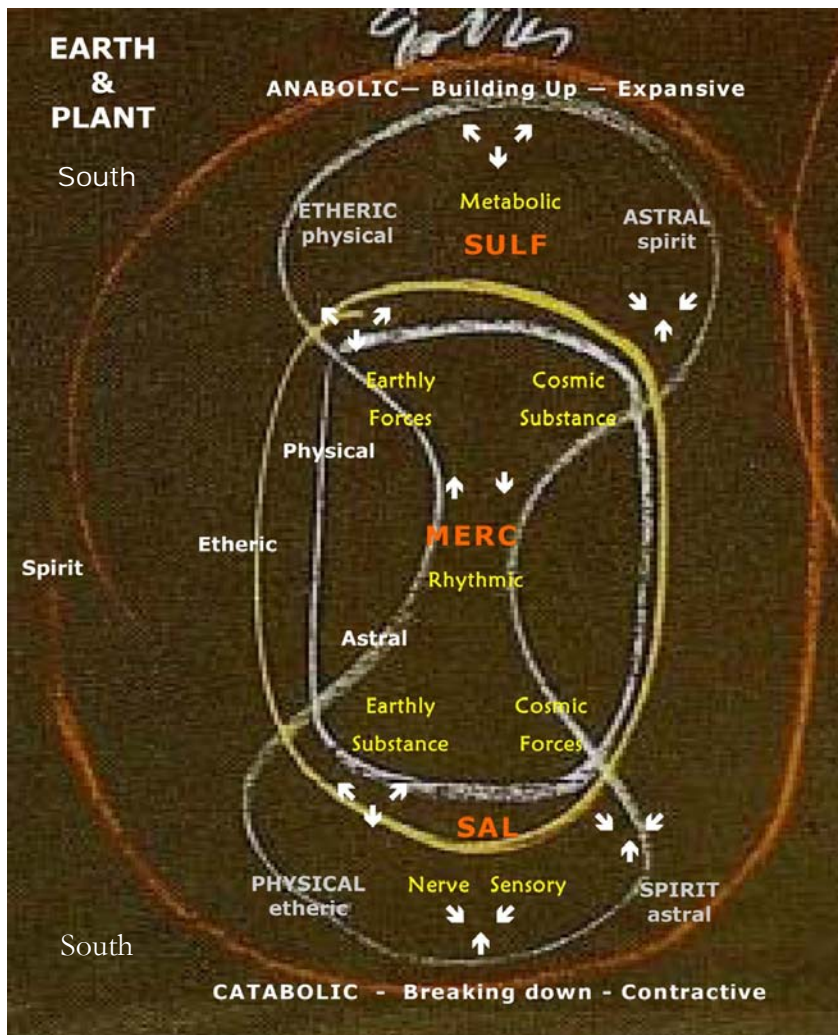
We can look into this fluttering world and say: From you, O fluttering creatures, there streams out something still better than sunlight; you radiate spirit-light into the cosmos! Our materialistic science pays but little heed to things of the spirit. And so this materialistic science is absolutely unequipped with any means of grasping at these things, which are, nevertheless, part of the whole cosmic economy. They are there, just as the effects of Earthly activities are there, and they are even more real. For what thus streams out into spirit-land will work on further when the earth has long passed away, whereas what is taught by the modern chemist and physicist will reach its end with the conclusion of the earth's existence. So that if some observer or other were to sit outside in the cosmos, with a long period of time for observation, he would see something like a continual outstreaming into spirit-land of *substance* which has become *Cosmicized*, as the earth radiates its own being out into cosmic space; and he would see — like scintillating sparks, sparks which ever and again flash up into light — what the bird-kingdom, what every bird after its death sends forth as glittering light, streaming out into the universe in the form of rays: a shimmering of the spirit-light of the butterflies, and a sparkling of the spirit-light of the birds. (10)

And still there is More

You may have noticed on page 13 “so that he doesn't permeate the bodily life in the right way with the Cosmic Forces active in the head — the astral, the ego-being “. I put this in bold to highlight another layer to RS story. Somewhere RS comments that we have all four bodies working in every circumstance. In the story we have had in front of us, we have in the nerve sense system, the Spirit inspired Cosmic Forces working with the Earthly inspired Earthly Substance, while in the metabolism we have the Astrally inspired Cosmic Substance working with the Etheric inspired Earthly Forces. We have had 2 players in each system.

RS's comment regarding all 4 activities in every circumstance means, we need to find the four activities, within each of the 3 Earthly organisations. So within the nerve sense activity we have all four activities, not two. So when he says Spirit inspired Cosmic Forces he means the Spirit is the dominate partner, and the Astral activity is present but secondary. Similarly the Earthly inspired Earthly Substance, actually means the Earthly is dominate and the Etheric is a secondary process.

Within the metabolic system the Astrally inspired Cosmic Substance, means the Astral body is the dominate actor providing movement to the metabolic processes. However the Spirit is present providing direction. The Etheric inspired Earthly Forces, means the Etheric is dominate while the Earthly is offering support.



Four New Preparations

Sand

River silica sand, not beach calcium sand

Add to a clay soil at 2—3 cms deep, work it in

Homeo— Trituate in Lactose for an hour, then water potencies

In horn spring to autumn

Brings in the Cosmic Substance and holds the Cosmic Forces in the ground

*Activates the Internal **Astral** and Spirit in the Metabolic system*

Clay

In a horn from mid winter to mid Summer to emphasis it rising capacity

Could also do 6 wks either side of mid winter

Apply to sandy soil. A 10 cm ball per 10 cubic meters of garden

Homeo—Trituate in Lactose for an hour then water potencies

Stimulates the upward movement of the Cosmic Forces

*Activates the Internal **Spirit** and Astral in the Nerve system*

Humus

Applied as compost .

Homeo Trituate in Lactose for an hour then water potencies

In horn on the Etheric cycle above the horizon

Stimulates the Etheric activity of the Earthly Forces

*Activates the Internal **Etheric** and Physical in the Metabolic system*

Lime - alkalis

Ph of the soil — apply alkalis

Homeo Calcium Carbonate other alkalis mixes? Magnesium (dolomite) all the cell salts. Trituate in Lactose for an hour then water potencies

In horn through winter

Draws the Earthly Forces and Etheric into the Earth

*Activates the Internal **Physical** and Etheric in the Nerve system*

References

- 1) Agriculture Course GA 327
- 2) from the 1920 medical lectures
- 3) Human Questions Cosmic Answers 2 July 1923 GA 213
- 4) Driving Forces in World History 22 March 1923 GA 222
- 5) The Groups souls of Animals, Plants and Minerals, 2 February 1908
- 6) Cosmic Workings in Earth and Man, lecture 5 , 31 October 1923
- 7) Physiology and Therapeutics, Lecture 3, 9 October 1920
- 8) The Relation of Man to the 3 Worlds 23 august 23 GA 227
- 9) Man as Symphony Lecture 3 , 21 October 1923, Dornach
- 10) Cosmic Workings in Earth and Man, 27 October 1923, Dornach

Pictures

(e) from NASA

(f) from St Peters basilica website—<http://saintpetersbasilica.org/>

Web addresses

Glenopathy www.garudabd.org

BdMax www.bdmax.co.nz