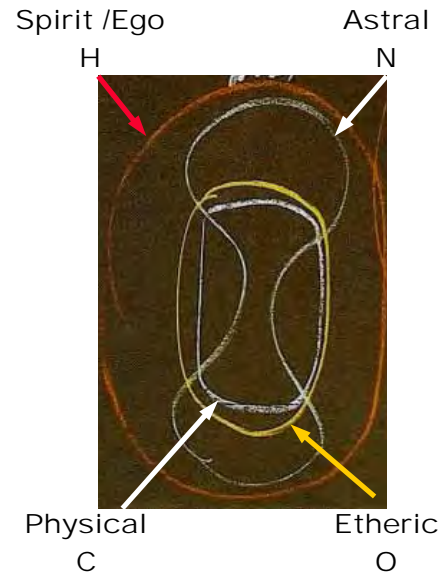


World to Internal Activities

In the previous lectures we explored how the energetic bodies in nature, work ONTO each other. We have seen how the bodies 'push' each other around. If one becomes stronger than normal, then the others move, either by being 'pushed out' or by being compressed, to accommodate the dominate activity. The image on page 16, showed how the etheric body acts as a cushion, to the inward moving Astral and Spirit, keeping them from entering too deeply into the physical body. This relationship between the bodies needs to constantly kept in mind, as it is the background mechanism for all the activities within the physical organism.



from 'Pastoral Medicine'

Our investigations can be taken to a deeper level, as not only do the energetic bodies work ONTO each other, but they also work INTO each other. By this I mean, we can see the organisational effect of the Spirit working into some of the manifestations of the astral body, (see "The 12 Senses"). Or we are seeing the Astral's influence working into Etheric and Physical bodies etc. Wherever we see things organised by the number 7, eg the 7 organs of the physical body, or the lectures on the 7 life processes, we see the astral body's influence. This naturally leads to a much more complex series of interactions, we have to find someway of approaching.

Astronomy provides us with the picture of creation as a series of gyroscopic electro magnetic beings, one inside the other. This provides an image of a huge energetic 'lake', where the various gyroscopes are all doing their own thing. They have their own speed of travel, speed of rotation, their own mass and thus their own frequency. They radiate this 'individuality' outwards into the 'lake'. Therefore there are many ripples upon the lake, of different frequencies, which every gyroscope, no matter how big or small has to adapt to. Here we have a field of interaction where

everything is effecting everything else.

Luckily, we only have four main activities to consider, when exploring life on Earth — the Galaxy, the Solar System, the Earth's Atmosphere and the Earth itself. Our task is to see how these four activities work into each others' sphere.

The easiest place to start, is to look at the atmospheric etheric region with its four elements, Fire, Air, Water and Earth. The association of the Fire element to the burning Star based Spirit, Air to the moving planetary Astrality, Water to the life producing etheric and the Earth element to the Earthy physical body, are all fairly easy to identify. Here the various elements gain their nature from these greater cosmic activities working into the Earths atmosphere. In a similar process we can see how the ethers, which are polaric siblings of the elements, also find their natures. In this earthly sphere, the elements are the macrocosmic activities, representative. Where warmth goes, so goes the Spirit. You may remember in the third session, how the elements of protein, Hydrogen, Nitrogen, Oxygen and Carbon, were outlined as the carriers of these activities, into chemistry, and thus they formed the material anchors of the activities, within manifest physical forms.

With the planetary Astral sphere it is a little different. In part two, of this book, the wonderful work of Dr Lievegoed will go into greater detail of these relationships, however to proceed to our next series of lectures a quick overview will suffice. For our purposes with agriculture we only need consider the six planets, as the Sun is our organising star. We have already identified that they organise into three inner planets and three outer planets, but it is not till we look further into their individual natures that we can identify how they mediate the energetic activities. We will see later the exact detail of this complex, however it is enough to say at present, if we list the planets according to their cycle around the Sun, we can then place the four activities accordingly. Thus each planet does not 'carry' one activity but represents a working together of the activities. Saturn, as the outermost planet is the carrier of the Spirit impulse of the Stars entering the planetary sphere, while Mars acts as a major focus of the Astral activity. Jupiter, in between the two, however is where the Spirit and Astral interact with each other. Similarly with the inner planets the Moon works with the formation of the physical body, while Venus looks both below and above itself. Venus helps the watery etheric activities of Mercury, meet with the downward moving activities of Mars. It is in the dance between Mars' astrality

| | | |
|-----------------|----------------|--|
| Spirit | Saturn | Carrier of the Spirit Archetype Impulse |
| Astral | Jupiter | Working together of the Spirit and Astral |
| Etheric | Mars | Strengthens the Astral body |
| Physical | Venus | Working of the Etheric towards the Astral |
| | Mercury | Strengthens of the Etheric body |
| | Moon | Incorporating the Etheric into the Physical |

and Venus' etheric activities, that fertility occurs. Mercury has a very stimulating effect upon the etheric body, while the Moon helps to draw this 'growth' activity to the physical body.

In a similar manner, it is possible to identify the galactic constellations relationship to the four activities, via their planetary ruler, as well as through their ruling element. See page 120.

The task of our next lectures, is to take one step out from the chemical elements discussed in lecture 3, and discover the activities that support the living processes, once the chemical elements are brought into life. We need to do this as the methods of controlling plant growth and feeding animals, lies where the etheric body picks up the physical organisation.

Before we move on to this task it will be beneficial to provide two reference diagrams. One for identifying the various energetic interactions (2) and a second for the words used in the used in these lectures to identify them. (1, pg 12)

These lectures use a series of terms that may seem usual to some. Rather than using the exact energetic activities interaction for everything described here, which can become very confusing, it is easier to change the terminology. So each time the discussion moves from describing one sphere of activity to another, it is hoped the name changes provide an easier key to follow. To clarify any confusion this name changing may have caused, you can use the second diagram, read in conjunction with the first diagram. This places the name usage in relationship to the energetic activity, intended.

In the introduction to these lectures we were introduced to two diagrams (b) and (c) B is looking at the 'Cosmic' astronomical spheres of our environment, while C is an image of how these activities organise themselves within 'moving' living organisations. This gyroscopic form (c) organises according to the polarities of the activities. Both the external World spheres and Internal manifest spheres work with their polarity. Our first series of lectures were an expression of both of these diagrams.

The next step is a diagram that identifies how these activities interact INTO each other. This can be achieved when diagram C is placed over the top of diagram B. This provides a cross reference of all the different energetic bodies interactions with each other. Take a moment to see how diagram B and C fit together to create diagram 2.

Before going any further, spend some time putting all this information together for yourself. The following lectures will be easier once you have done this.

Moving into Manifestation

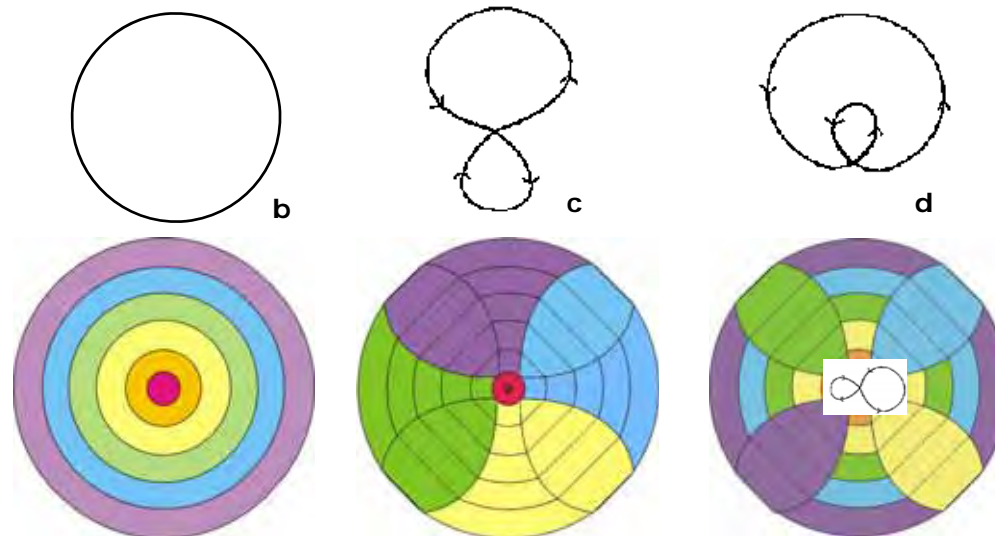
The practical reality of manifest form requires we take one further step. We can identify three stages, for something to come into manifest form. So far we have looked at the first two—'what is' and what happens when things begin to move. The next step is what happens when life takes form.

This three fold process can be seen in the simplest of our living processes, the dividing of a biological cell in nature. This process can be characterised as 'the circle' of what is. – the cell (1), which begins to move into a pulsating lemniscate of activity (2), before this divides, providing cell division (3).

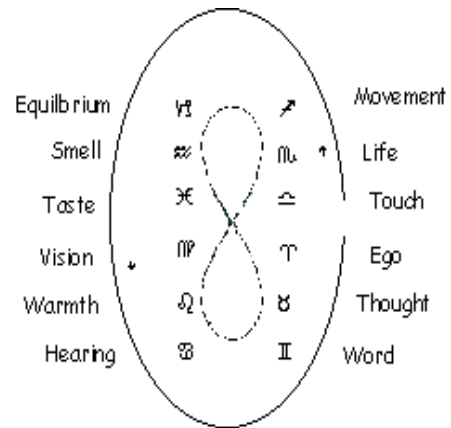
In our case the Universal 'What is', is identified in diagram b. Once it begins to move it polarises, to become diagram c. The last step, is for the manifest part of this diagram. to enfold into a manifest life form living somewhat 'independently' within the external cosmos.

On a larger scale the same is true of the formation of a physical form. First there has to be a planet, which can support life (1). This life, in many cases needs separate male and a female forms (2) to come together to make the new physical form. (3)

As we move closer to Manifestation, and consider it's internal organisation we find a another step of 'polarisation' occurs. This shows as a lemniscate twist within the internalised sections of the diagrams, on page 12. This lemniscate process was used in the lectures given on humans, in 'The 12



Senses' , and their sense relationship to the constellations. We find the same lemniscate twist is needed to appreciate the ordering of the activities found in the internal workings of the 'Agricultural Individuality' we are about to explore. Take special note of the switching of position of the Internal Etheric and Internal Spirit , from that seen on pg 12. The pictures on the next page, (g) shows this development . The bottom picture is how our story will unfold in the following lectures, while the top picture is where we have got to so far.

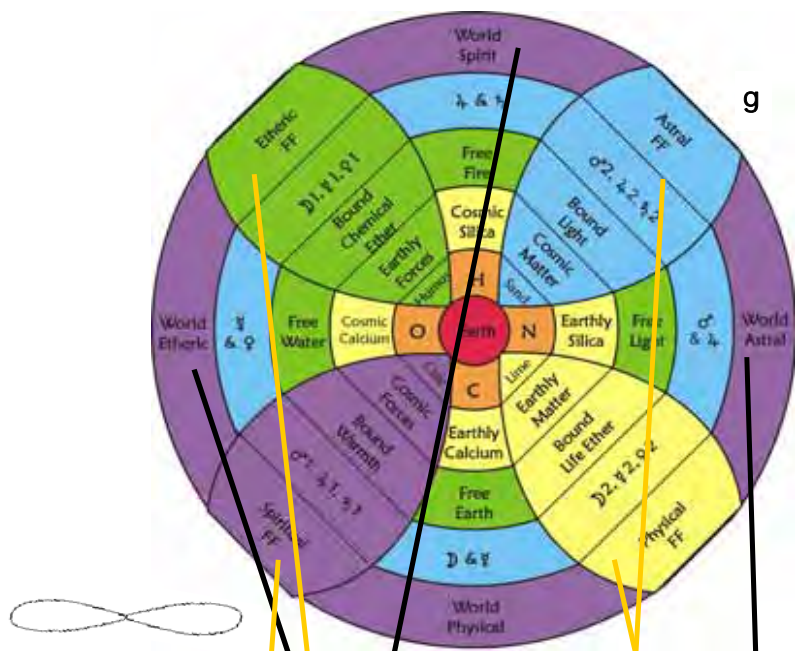


The Twelve Senses

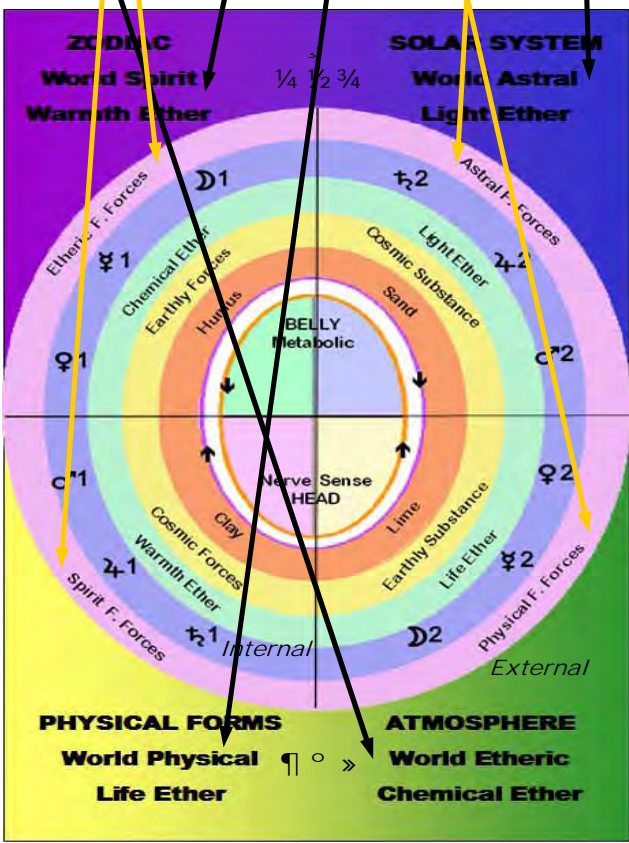
While several new terms are about to enter our language, it is important to remember that in every circumstance, the main players are the 4 energetic 'bodies'. Each set of name changes ,indicates which one of the six levels, of our immediate creation, is being outlined. The 'game' is

4 activities functioning on 6 levels, both internally and externally.

The bottom diagram on the next page has the inner circles representing the internal activities, while beyond this are the external activities, which could also be represented with 6 rings, if so required.



g



Earthly and Cosmic — Calcium and Silica

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, 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.

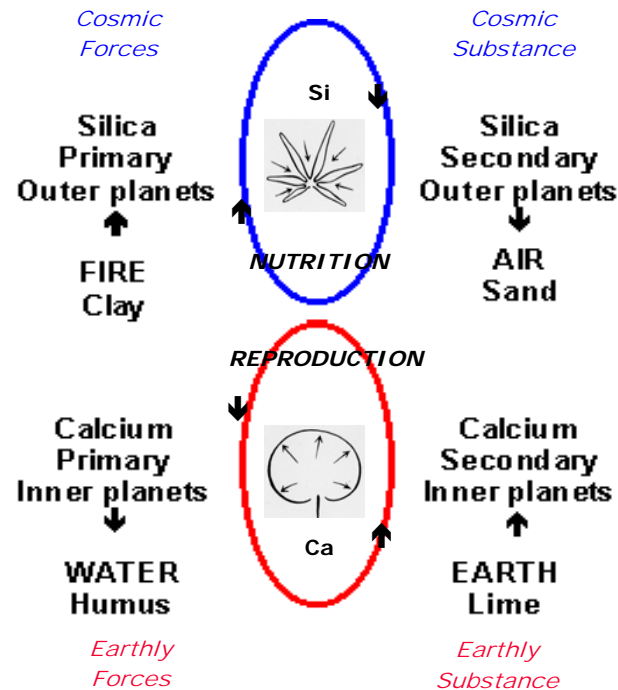
It is only through the balance of these two formative forces - as embodied in these two substances, silicon and limestone - that plant life can flourish in the form in which we know it today. *This working together however must be identified in two stages. The first in how the external processes work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

Now, *in the first stage*, everything silicious contains 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 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 influences of Mars, Jupiter and Saturn, the limestone those of Moon, Venus and Mercury.

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.

Peppering

A large number of plants (and more especially those which we call weeds and which often have powerful healing properties) are particularly subject to the influence of the Moon. All that we know of the Moon in the ordinary way is that the rays of the sun fall upon it and are reflected back to the earth. The moon-rays which we see by taking them up with our eyes and which the Earth receives too are thus reflected sun-rays. And these reflected sun-rays come to the Earth charged with lunar forces; this is so ever since the Moon separated from the Earth. In the cosmos, these very lunar forces have a strengthening effect upon all that is earthly. When the Moon was still united to the Earth, the Earth was much more alive, much more fertile. Its substances were not yet so mineralised within it. But since the Moon has separated from the Earth, it strengthens those forces of the Earth which by

themselves are just sufficient to produce growth on earth in such a way that growth is enhanced to reproduction. (When a being grows it increases in size. Hence the same force is at work which leads to reproduction. But growth does not go so far as to produce another being of the same kind; it is merely that cell grows upon cell, a weaker kind of reproduction: whereas reproduction is an enhanced growth), The Earth can of its own strength be the mediator of this growth only - this weak kind of reproduction; without the Moon it cannot control the enhanced growth. To achieve reproduction proper, it needs the cosmic forces of the Moon which shine into the Earth sphere and in the case of some plants, also those which come from Mercury and Venus.

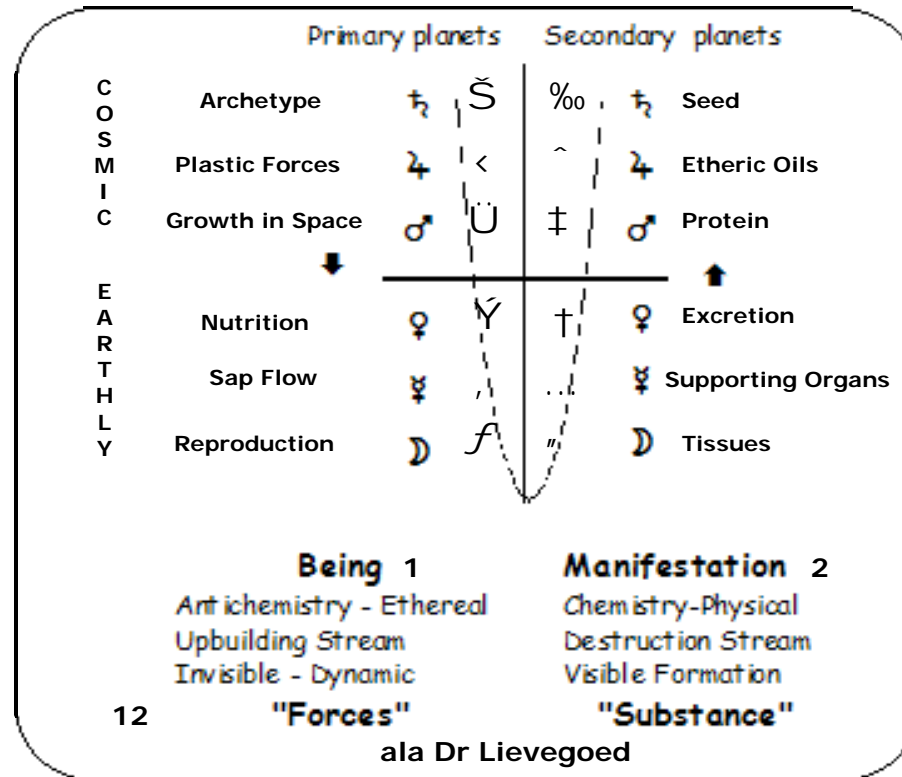
As I said before, people look upon the Moon as simply reflecting the rays of the Sun, as transmitting solar light. But that is not the only thing which reaches the Earth. Together with the Moon's rays, the entire cosmos is reflected upon the Earth. (Everything that affects the Moon is reflected. And though this cannot be proved by the usual methods of physics, the whole of the starry heavens is in a sense reflected on to the Earth from the Moon.) It is a powerful and strongly organising cosmic force which is poured down from the Moon into the plant and enables it to produce seed, thus enhancing its power to grow to the power to reproduce. But all this can only come about at any particular spot when the Moon is full. When the Moon is new, the area will not enjoy the benefits of lunar influence. During the new Moon, plants can do no more than retain what they took in at the time when the Moon was full. We should reach important enough results if we pursued the custom (known in ancient India and still maintained up to the nineteenth century) of observing the phases of the moon at seed-time and of making use of its effects upon the very earliest stages of germination. But Nature is not so cruel as to punish man for his inattention and discourtesy to the Moon at times of sowing and harvesting. We have a full Moon twelve times a year. This ensures that the influences of the full Moon, i.e., those which promote the formation of fruit, are there in sufficient strength. If something to be grown is placed in the soil at new Moon instead of at full Moon, it will wait until the Moon is again at the full, and, regardless of human error, work in accord with Nature. Thus men make use of the moon without having the least idea that they are doing so.

But this alone does not help us any further. For, as things are, weeds claim the same rights as useful plants, and we get them all mixed up together because we do not understand the forces that regulate growth. We must try and enter into these forces. We shall then see that the fully developed strength of the Moon, promotes the reproductive forces of all living plants, that it creates the force which pushes upwards through the plant from the

root right on into the seed as it is being formed in the fruit. Now we shall get the best possible weeds if we allow the Moon to shed its full beneficence upon them, and do nothing to stop its influence. Furthermore in wet years when the lunar forces are more active than in dry weather, the weeds will increase and multiply. If, however, we take these cosmic forces into our calculations we shall reason as follows: If we can cut off (apply a tourniquet, as it were) the full influence of the Moon from the weeds, allowing only those influences to reach them which work directly from outside (i.e., non-lunar influences) we shall be able to set a limit to their propagation. For they will then not be able to reproduce themselves. Since, however, we cannot screen off the Moon, we shall have to treat the soil in such a way that it will be disinclined to absorb lunar influences. Moreover the plants, these weeds, will then develop a certain reluctance to grow in soil that has been treated in this way. This will give us what we want.

We must boldly take the matter in hand. We must not be afraid, and this is how we must proceed. We collect a number of seeds of the particular weed in question, i.e., those parts which contain within themselves the final workings of the force of which I have been speaking. We light a flame - that of a simple wood fire is best - and burn the seeds, carefully collecting the ash, of which we accumulate a relatively small quantity in this way. But in the ashes of these seeds we have literally in concentrated form, the force that is the opposite of the force which was developed under the influence of the Moon. We then sprinkle the pepper-like preparations on our fields -we need not go very carefully to work for the influence spreads over a large area - and we shall see in the second year that there are far fewer of the weeds in question. After four years of this treatment, the weed will have completely disappeared from our field. In this way the "Effects of smallest Entities", which has been proved scientifically by the Biological Institute (at Stuttgart), is literally put to fruitful use.

A great many results are to be obtained in this way, as you will find out if you really take account of these influences, which are totally disregarded nowadays. For instance, in order to use the dandelion in the manner I outlined to you yesterday, you can plant a number of them anywhere. But you can at the same time make use of the dandelion seed for the production of this burnt pepper to be scattered on your fields. In this way, you will be able to plant dandelions wherever you like, but you will also ensure that the field that has been treated in this way with dandelion ash will be free of dandelions. All these things were contained in the old instinctive husbandry. In those days, one could put



what plants one chose to grow together, because one went about it with a sort of instinctive wisdom. From what I have said, you can see that these things are the starting point of a really practical method. And since today the view - I will not call it the prejudice - obtains that everything must be verified, I urge you to put these things to the test. If you carry through the experiments properly, they will verify what I have said. If however, I myself were working on a farm, I should not wait for proofs but go straight ahead, for I am sure that these things are practicable. I look at it in this way: the truths of Spiritual Science are true in themselves and require no verification from outside or by external methods. (The mistake of all our anthroposophical scientists has been that they adopted external methods of verification. They have done so even within the Anthroposophical Society, where they certainly ought to have known that things can be true in and through themselves. But if one wants to establish any results in public nowadays, one needs external verification: there the compromise is necessary. In actual fact it is not necessary). For we know things inwardly, i.e., that they are true through their inner nature. For example: Suppose I put fifty persons to

work in manufacturing a certain material. Now, if I want three times as much of the material made, I know quite well that I should need a hundred and fifty persons to get the job done. But a subtle person may come along and say: no I do not agree. You will have to put it to the test. You will have to try it out on a given piece of work, putting first one, then two, then three persons on it and establish how much they do". Now if all three spend all their time chattering, they will do less work than one person. The assumption can turn out to be false, for scientific experiment has shown results that are opposed to the assumption. But the idea is not refuted although the experiment has "proved" the contrary. To be really exact, the falsifying factors would have to be examined. Then what is inwardly true will also become outwardly established.

We are able to proceed in a fairly general way as regards the noxious plants in our fields. But we cannot speak so generally when it comes to methods of controlling the noxious animals. I shall take an example which will be particularly characteristic and will enable you to make experiments and see how these things work out. Let us take an old friend of the farmer - the field-mouse. What efforts have not been made to combat this little creature? You can read in agricultural works of the use of preparations made of phosphorus or strychnine and saccharine. Even the drastic remedy of infecting the field-mouse with typhus has been suggested, to be applied by mixing with mashed potatoes certain bacilli harmful only to rodents, the mixture being distributed as required. These things have been done, or at any rate they have been recommended. In any case, all sorts of rather inhuman methods have been tried in order to get rid of these quite pretty-looking little animals. Even the government has taken a hand in the struggle, because it is not of much use to fight the field-mouse on your own land if your neighbour is not going to follow suit. Otherwise the mice simply come across from the adjacent fields. The government had therefore to be called in, in order to compel everyone to get rid of their field mice by the same method. Governments do not like exceptions. When a government selects a method which it thinks the right one (regardless of whether it is or not) it issues its instructions, and these have to be followed by every farmer. All this is simply proceeding by trial and error and laying down the law from outside. And one always experiences that those who proceed in such a manner are never quite happy about the results, for the mice invariably reappear. It is quite true that no method can be entirely effective on one estate only; It can however be shown to be partially effective on a single estate and then one must rely on human intelligence in inducing one's neighbours to follow the same method. For in the future, men will need to rely to a far greater extent upon reason and common sense than on police or government regulations. That will be a first real step forward in our social life.

Not let us imagine the following. We catch a fairly young field-mouse and skin it. The main thing is to get this skin when Venus is in the sign (constellation) of Scorpio. Those old fellows of the Middle Ages with their instinctive wisdom were not fools after all. They pretended that in passing from the plant to the animal kingdom, we come upon what they called the zodiac, which means "animal circle". Indeed if one wants to exercise an influence in the plant kingdom, one can content oneself with the use of planetary forces. But with animals this is not enough. Here the fixed stars have to be taken into account, especially those fixed stars which belong to the signs of the Zodiac. In the plant kingdom the influence of the Moon is practically sufficient to call forth the powers of reproduction. In the animal kingdom the Moons influence must be strengthened by that of Venus. Indeed in this case the influence of the Moon need not be specially taken into account because the animal kingdom has retained within itself Moon forces (from past epochs, Ed.) and has thus emancipated itself from the actual Moon. In the animal kingdom lunar forces are at work even when the Moon is not at the full. The animal bears the full Moon within itself and is therefore emancipated from time conditions. There is, however, a dependence as regards the other planetary influences. We have to undertake something quite definite with the skins of the mice in connection with these. The skin must be secured at the time when Venus stands in the sign of Scorpio, then burned and the ash and any residue carefully collected (several skins must be burnt to procure a sufficient quantity of ash). Now because the skins have been burnt when Venus stood in Scorpio, that which is contained in these ashes is the negative power to the power of reproduction in the field-mouse. If, in certain districts, difficulties present themselves, a more homoeopathic method can be adopted to procure this pepper-like substance. If, however, it has been obtained during the high conjunction of Venus and Scorpio it will, when sprinkled on your fields, prove to be a means of keeping field-mice away. No doubt they are cheeky little creatures and are apt to come back again if "pepperless" areas still remain in the neighbourhood. In such areas the mice will again settle down. But if the method is applied throughout the neighbourhood, it certainly brings about a radical result.

I believe a certain pleasure could be derived from putting such methods into practice. I believe that agriculture would acquire a sort of savour as of a well-seasoned dish. Moreover we take into account here the workings of the stars without the least concession to superstition. Superstition arises only when an earlier knowledge is no longer understood. We do not revive superstitious beliefs. We must start from insight, but an insight which has been won in a spiritual way and not by physical methods.

This then, is the way to deal with field-mice and any other pests from among the higher animals. Mice, being rodents, belong to the higher animals. But this method will be of no use in attacking insects, for these come under completely different cosmic influences, as do all the lower animals as compared with the higher.

In this case, the procedure is not to take any particular part of the animal as we did with the field-mouse, but the whole animal must be taken. This insect which attacks the roots of the plant is as a whole a product of cosmic influences, needing the soil only as a medium. Thus the whole insect must be burnt. That is the best and quickest method. A more thorough way might be to allow it to decay, but then it would be difficult to collect the remains, and practically the same result can be obtained by burning the whole insect. The insect can be collected and kept-alive and then burnt at the proper time. The incineration must take place when the Sun is in the constellation - of the Bull (i.e., the constellation exactly opposite to that which was mentioned in connection with Venus and the burning of the mice skins). For this insect world is closely related to the forces that are developed as the Sun, on its path through the Zodiac, passes from the sign of the Water-carrier through the Fishes to the Ram and the Twins and on to the Crab. In the sign of the Crab the influence becomes quite weak; it is weak, too, in the sign of the Water-carrier. As the Sun goes through these signs (Water-carrier, Goat, Fishes, Scorpion, Scales, Virgin, Leo and Crab, the first and last being the weakest) it, radiates those forces which are connected with the insect world.

We do not realise what a very highly specialised being the Sun is. It is by no means the same when, in the course of the year or the day, it shines on to the earth from, say, - the Bull as it is when it shines from e.g. the Crab. In each case it is different: so that it is nonsense strictly speaking (though pardonable nonsense) to speak of the Sun in general. One should really speak of the Ram-sun, the Bull-sun, the Crab-sun, the Lion-sun, etc. The Sun is always a different being according to the combined effect of its daily and yearly course, as determined by its position in relation to the vernal point. If, then, you prepare insect-pepper in the way I have described and scatter it over a field of turnips, the nematodes will gradually become "faint". After the fourth year they will have completely faded away. They cannot live - they shun life if they are to inhabit a soil that has been peppered in this way.

Thus there re-emerges in a remarkable way what used to be called the "Wisdom of the Stars", Modern astronomy only serves as a means of mathematical orientation, and cannot really be put to any other use. But astronomy was not always like this; the stars once served as a guide for the

labours and activities of life on earth. This science has now been completely lost. But to the extent to which we can develop a new science, we have the possibility of controlling those animals and insects which become a nuisance. It all depends on our capacity to be, as it were, on such intimate terms with the earth that we come to know her capacity for bringing forth plants, especially through the power of lunar and water influences.

But the forces in every plant and in every other being carry in themselves the germ of their own destruction. Thus, just as on the one hand water is a promoter of fruitfulness, so on the other hand fire is the destroyer of fruitfulness. It consumes it. And if instead of treating plants with water, which is the usual way of making them fruitful, you treat them with fire, applied in an appropriate manner, then you are performing within the economy of Nature an act of annihilation. This is the point to be borne in mind: a seed develops fruitfulness and spreads it abroad through the Moon-saturated water. It also develops destructive forces through the Moon-saturated fire, or, strictly speaking, as we saw in our last example, through cosmically-saturated fire. There is nothing very strange about this: we are reckoning here with enormous forces of expansion and have given exact indications of how time co-operates; for the seminal power is notably active in expanding, and so if it is destroyed. It also works very far a field. The force of expansion is peculiar to the seed. And the burnt substance which because of its appearance we called pepper, also possesses the tendency to spread its power abroad.

The Physical Formative Forces

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.

Animals

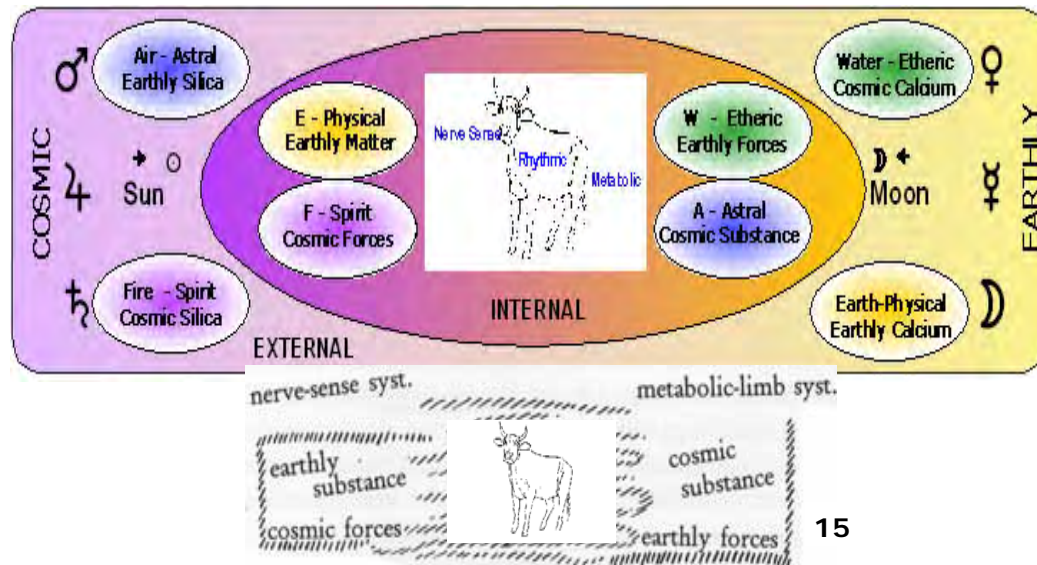
In the animal, the threefold organism is not so sharply defined as it is in man. The animal has a system of nerve and senses and a metabolic and limb system. These are clearly divided, the one from the other. But in many animals the limits of intermediate rhythmic system are indefinite; both nerves and 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.

We have come to a complex part of the story, with more new words being needed to easily describe the processes active within the physical bodies, of life. Even though the words 'forces' and 'substances' are used to describe the two sides of either the Silica or Calcium activities, it must be remembered that the four activities outlined, all work firstly as an energetic

force, which 'stands behind' the manifestation of various physical formations.

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.

Horn Preparations

Now following this trend, 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 Force*, formative forces, which then penetrate right into the metabolic system, so that *a compounded* activity in the digestive organism arises by reason of this radiation from horns and hoofs. In the horn, therefore, we have something which by its inherent nature is fitted to reflect *back* 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 inwards 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 / *Earthy Force* elements.

The Astral / *Cosmic Substance* element has filled it with nitrogen-bearing forces and the Etheric / *Earthy Forces* 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 . 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 and Astral 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 (*earthly*) 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. I shall deal with this point later. For the moment, let us continue with the matter in hand.

Let us put manure just as it comes to hand into a cow-horn, pressing it full, and bury it at a certain depth - say 1 to 2 feet deep according to the soil which should not be too sandy or clayey. We can choose any spot where the soil is in good heart. Now by thus burying it with its filling of manure, we preserve in the horn that function which it would normally exercise in the cow's body, that is the reflecting of the (*internal*) life-giving and Astral elements. Through the fact of its being surrounded with earth, all the currents of Etheric and Astral forces stream into its interior. These forces attract all the Astral and Etheric elements from the surrounding soil, and

the manure contained in the horn becomes inwardly quickened with these forces in the course of the winter season when the earth itself is most alive. For the earth is most inwardly alive during the winter. All these living forces are preserved in the manure and thus there is a highly concentrated, life-giving manuring force in the contents of the horn. Then (in spring) the horn can be dug up and its contents removed. Those of you who were present at Dornach when last we made this experiment will remember that you were able to convince yourselves of the fact that when the manure was removed it was completely odourless. It was quite striking. The manure no longer smelt at all, though naturally it began to do so a little when it was mixed with water. This shows that all its odour had been concentrated and worked up within it. You have here a tremendous astral and etheric power which you can utilise by taking the content of the cow-horn after its period of hibernation and diluting it with water which perhaps should be slightly warmed. As regards quantities and dilution, I have ascertained by repeated observation that an area of about 1500 square yards (near one-third of an acre) can be served with the contents of such a cow-horn, diluted in about half a bucket full of water. The whole of the contents of the horn must be thoroughly united with the water. You must begin to stir it briskly round the edge of the bucket until a crater is formed in the middle reaching almost down to the bottom. At this point, suddenly reverse the movement thus causing the liquid to swirl round in the opposite direction. If you do this for an hour, the ingredients will become thoroughly mixed. You must remember what a really small amount of work is entailed in this. Besides I can very well imagine that some of the less occupied members of a farming community would derive particular pleasure from stirring manure, at any rate to begin with. It would be splendid work for the son or daughter of the house, for it is a very agreeable experience to find that a faint scent develops from what is at first completely odourless. It is extremely beneficial for a man thus to establish a relationship with the work he is doing, instead of studying Nature in a large way as it were with the help of a Baedeker.

The next thing to do is to spray the mixture over tilled land so that it can get thoroughly into the soil. Small areas can be treated with an ordinary syringe, larger areas will naturally call for the employment of specially constructed machines. But once we have learned to combine this kind of "spiritual dung" with ordinary manure it will be found that very great fertility will be produced. In particular it will be found that these things are capable of still further development, for in addition to the measures I have just indicated, we can proceed as follows: Again we take a cow-horn and fill it in the same way, not with manure this time, but with quartz or flint or even orthoclase or feldspar that has been ground to powder and mixed

with water so as to form a thin paste. Then instead of leaving the horn in the ground throughout the winter, we leave it there over the summer, take it out in late autumn and keep it till the following spring. Its contents, which have been exposed to the summer-life of the earth, are then emptied out and treated in the same way as has been described in connection with the dry manure, except that much smaller quantities are required. Thus a pinch of the contents of the horn about the size of a pea or even of a pin's head can be diluted in a bucket of water; the main thing is that it must be stirred for an hour, as before. And if you use this mixture for spraying the plants (not pouring it on to them but finely sprinkling it) you will see, particularly in the case of vegetables and the like, that this has the effect of supplementing and reinforcing that which works out of the soil through the cow-horn manure. And if, as would not be amiss, the practice were extended to whole fields - it would be easy enough to devise machines which would sprinkle the liquid over whole fields - then you would see how the cow-horn manure was pressing up from below, the other drawing from above, neither too weakly nor too strongly. And this could have a wonderful effect, particularly on cereals.

The Role of Animals

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.

Plants and Soil

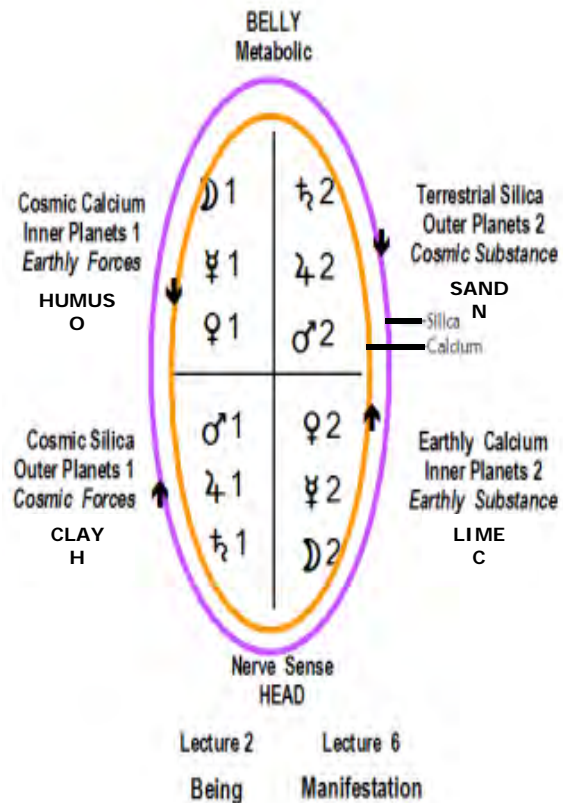
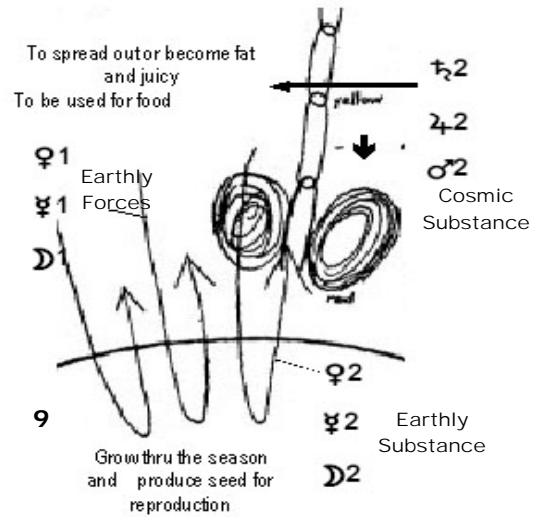
Now, *with the plant and soil, the situation is similar*. I want you to imagine that Diagram No. 9 (*see next page*) represents the earth level, where the 'Earthly' influences of Venus, Mercury and Moon; enter into the earth *as Earthly Forces* and stream again from below upwards, *as Earthly Substance*. These are the forces which cause the plant to grow during the season, later produce *viable* 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' or Silica based activities*, however, which take the other path, *and work from above* the earth level, come from the distant planets, *as Cosmic Substance*. I can draw this schematically in this way. These forces, *working with the Earthly Forces from above, in the belly*, 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.

We must learn to distinguish those *Earthly activities* which arise in the cosmos, but are absorbed by the earth and work upon plant-growth from within the earth, *as Earthly Substance*. These forces come from Mercury, Venus and Moon and act not directly, *like the Earthly Forces*, 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 forces taken by the plant from the outer-earthly, and brought to it by way of the atmosphere from the outer planets, *as Cosmic Substance*. 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, workings of silicon, even though they proceed from the earth, as *Cosmic Forces*, act as mediators of the forces coming from Jupiter, Mars and Saturn, but not for those of Moon, Mercury and Venus, which are present in the soil as *Earthly Substance*. People are quite unaccustomed to taking these things into account. Ignorance of the cosmic influences, whether they come through the atmosphere around the earth, or whether they come from below through the medium of the earth, has caused great harm.

The *Earthly Forces* at work above the earth are immediately dependent upon what we will regard for the time being localised on the planets Moon, Mercury and Venus (*primary 1*). These planets in strengthening and modifying the effects of the Sun, exercise their influence on all that is above the earth surface, while the more distant planets lying outside the earth's path round the Sun, strengthen and modify



the effects of the solar influences, *which after being drawn into the Earth as Cosmic Substance*, penetrate upwards through the earth as *Cosmic Forces*.

Thus, *with regards to The Forces*, the growth of plants is affected by distant heavens in so far as it takes place underground, and by the nearer heavens in so far as it takes place above ground; *so the Force* influences upon vegetable growth coming from the expanses of the Cosmos do not shine directly down upon the earth but are first absorbed by the earth, which then causes them to radiate upwards.

Cosmic Substance and Forces

What comes from beneath as good or bad vegetable growth are really the cosmic 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 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. These effects are found in what we know generally as sand and rock; the substances which do not absorb water, which are ordinarily supposed to contain no nutritive elements whatsoever, and which nevertheless play a very important part in the promotion of growth. These minerals are entirely dependent upon the activities of forces coming from the remotest parts of the Cosmos, and, improbable as it may appear, it is primarily through the medium of siliceous sand, that it comes about that soil contains and radiates upwards what may be called the etheric life of the Earth and that which is chemically active in the Earth. The inner life of the soil and the formation of its particular chemical properties, depend entirely upon the constitution of its sandy parts, and what the plant roots experience within the soil is determined by the amount of 'Cosmic' life and 'Cosmic' Chemistry, which the Earth has absorbed through the mediation of its stony substance (which of course may lie at some depth below the surface). Anyone therefore, who has to concern himself with the growth of plants should be quite clear as to the geological structure of the ground from which the plants are to grow, and further should bear in mind in all cases that those plants whose roots are for us of primary importance cannot do without silicon in the soil, even though this may lie well below. We should be thankful that silicon makes up 47% to 48% of

the Earth, either in the form of silicon (silicic acid) or in other compounds. Such supplies as we need are therefore always present.

Now the effects which have been brought about in the root through silicon *and the Cosmic Forces*, must be borne upwards through the plant. It must stream upwards and there must be a constant interaction between the cosmic forces that have entered into the plant through silicon and the *Cosmic Substance* that are active above - forgive me in the "belly" and that supply the "head" below with what it requires. True the "head" must be provided for out of the Cosmos but this process must interact with *the Cosmic Substance* that takes place above ground in the "belly". The forces coming in from the cosmos and being caught up underground must be able to flow upwards again, and the substance which brings this about is clay. Clay is the mediator through which the cosmic activity in the soil is enabled to work from below upwards. In actual practice this will give us the key to the handling of both clay soil and sandy soil according to the particular way we may wish to cultivate. But we must first know what is actually happening. How clay is to be described and treated in order to make it fertile are important but secondary considerations. The first and foremost thing to know about clay is that it promotes the cosmic upward flow.

Let us suppose that we want to hold back these 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.

Crystallisation

The mineral substances have to free themselves from the *Cosmic Substance* forces which are working immediately above the surface of the Earth, if they wish to be accessible to those far away Cosmic Forces.

In our epoch this emancipation from the processes in the immediate neighbourhood takes place in the period of the time between the 16th January and 15th February, i.e. in Winter, The time will come when these indications will be acknowledged as exact data. It is at this period of the Winter that within the Earth the formative forces of crystallisation reach their full development in the mineral substances. In these days of mid-winter it is a peculiar feature of the interior of the Earth that it becomes less dependent upon its mineral masses and falls under the influence of the crystallisation forces of the cosmic expanses.

Now consider what happens, Towards the end of January the mineral substances of the Earth have a greater "longing" than at any other time to reach crystal purity in the economy of nature; and the deeper one goes, the greater one finds this "longing" to be. The plants, absorbed in their own life in the Earth are less open at this time than at any other to the influence of

the mineral substances. But for a time before and for a time after this period, (but especially before when the minerals are preparing to perfect their crystal shape and purity) they are of the utmost importance to the growth of plants. It is then that they throw out forces which are of extreme importance for plant growth. Thus some time in November and December there is a point of time when the mineral forces at work under the Earth are particularly propitious to the growth of plants. The question therefore arises: How can this best be utilised for the growth of plants? Some day it will become evident that by utilising this knowledge we are able to guide the growth of plants. I will say this now: That in the case of a soil which does not in itself promote the required upward movement of forces which ought to work upwards in Winter period, it is well to add clay in a proper proportion. (I shall indicate this proportion later on.) In this way we enable the soil to carry those forces, upwards to make it effective in the realm of plant growth above the Earth; before the forces of the minerals have reached their maximum effects for themselves, which will not be until the January or February period. (These forces show themselves outwardly - for those who can read their story - in snow crystals.) It may be noted that the power of these forces become stronger and stronger the deeper we go into interior of the Earth.

In this way what seems to most people recondite can give us insight of the greatest positive value and practical help, where we should otherwise be working at random. Indeed we must realise clearly that the cultivated ground together with what lies under the surface of the Earth forms an individuality living also within the element of time (i.e. living through the four seasons) and that the life of the Earth still is particularly strong during Winter, whereas in Summer it undergoes a kind of death.

Earthly Forces and Substances

However this cosmic 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 influence of the Sun, Venus, Mercury and Moon (*primary 1*), and the warmth which makes itself felt within earth and which stands under the influence of Mars, Jupiter and Saturn (*primary 1*). 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 Earth's 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 to-day 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.

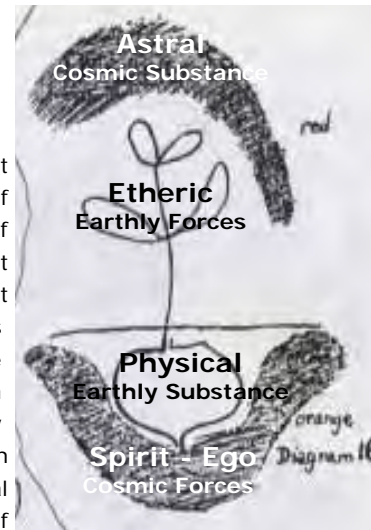
They do so because they reason as follows. The albumen (or protein) molecule, they say, must be of enormous complexity, for the organism in succeeding plants arises from it. This organism is enormously complex, and since its structure was determined by the embryonic conditions of the seed, the latter's 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 off- spring 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 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* form. At the moment when the seed is placed in the soil it is strongly worked upon by the Terrestrial 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 *Earthy* 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; but now that the plant is sprouting it is necessary to oppose the Terrestrial 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 Terrestrial 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 Terrestrial Forces are held fast within them. The Cosmic Forces then work only in the upward stream that terminates in seed-formation. While the Terrestrial 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 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 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*. 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 terrestrial element and only in the finest shading by the colour can the cosmic element be seen. The Terrestrial 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 Terrestrial Forces that causes the form to spread. When the root develops and divides, it is due to the terrestrial 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 terrestrial 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 Terrestrial Forces above the earth, works downwards and is drawn into the plant with the help of the limestone. Plants which draw down the Terrestrial *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 Terrestrial 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.

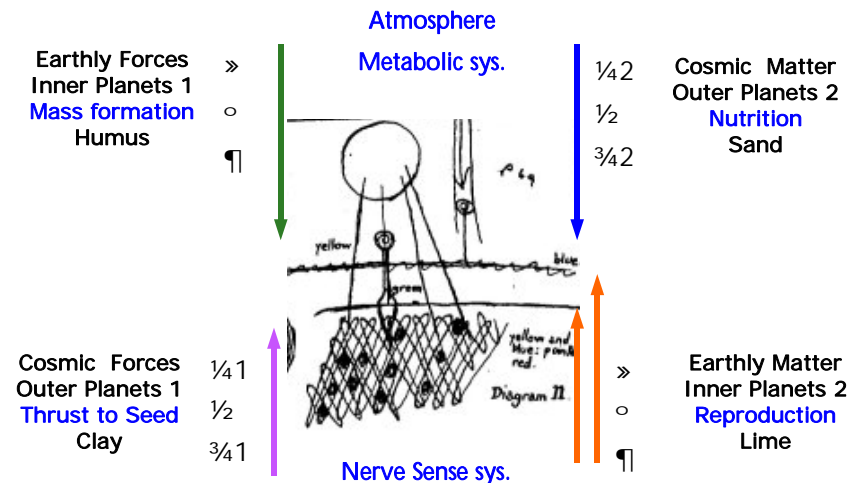
It is imperative that our knowledge should penetrate to the actual structure of Nature. For example, man knows more or less what happens to air inside the earth, but he hardly knows any thing of what happens to light inside the Earth. He does not know that Silicon, the cosmic mineral, takes up light 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

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 lunar force, *supported Earthly Substance*, distributed in the earth to work upwards, *with the Cosmic Forces* 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 life, and this decaying life forms another level above the soil level. This new level is not soil, but the same 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 working upward from the earth are prevented from reaching their proper height. The powers of fertilisation and fructification 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.

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, especially in sandy soils.

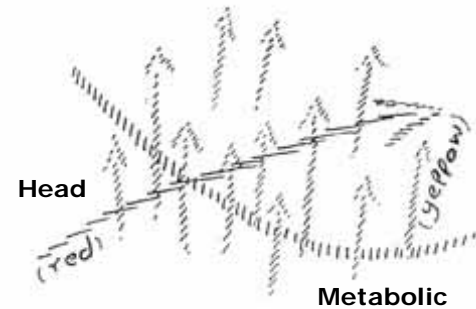
We can go one step further. Healing is not based on the microscopic changes in tissues and cells, but on a knowledge of the larger connections; this must also be our attitude to the plant nature. And since plant nature is in this respect simpler than that of the animal or man, so its healing is a more 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.

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.

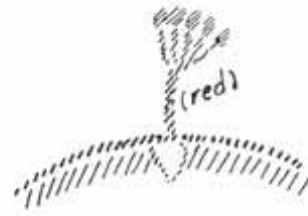
In another context I have indicated that the child's acquisition of speech is accompanied by various organic processes. While he is learning to speak, and therefore while something special is taking place in his breathing organism, something also occurs polarically in his circulatory organism, which 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) 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 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 extra-terrestrial 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 — can develop right on the earth's surface (see drawing below, red). Then fungi arise; this is the basis for fungus formation.



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, *from the metabolism towards the head*, are prevailing within the human being.

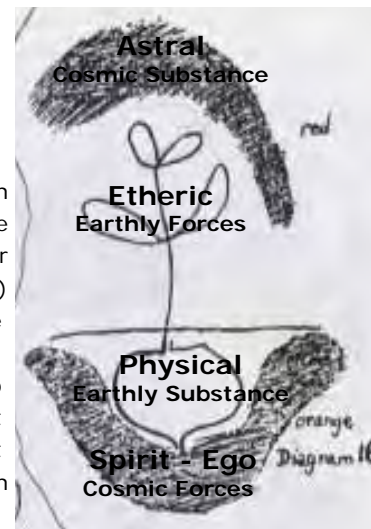
But when, as here, the processes work so deeply into the organism, much more will naturally be achieved by trying to find the specific remedy with which to oppose the particular process at work. One should try intermediate potencies of cinnabar. In cinnabar we will find effects that counteract all the 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. 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.* (4)

Animal Husbandry

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.

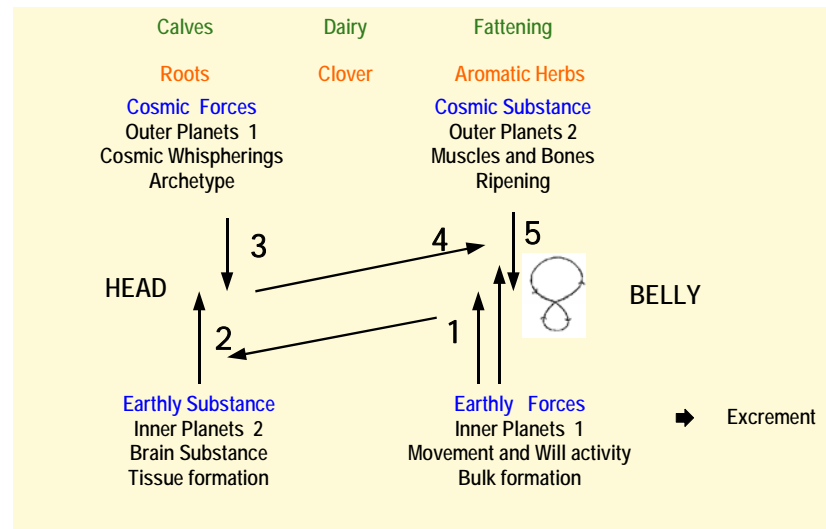
The farm is truly an organism. The astral element is developed above, and the presence of orchard and forest assists in collecting it. If animals feed in the right way on the things that grow above the earth, then they will develop the right ego-potentiality in the manure. If they produce, this ego-potentiality, 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 *Earthy 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 *Earthy 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 *Earthy 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 in-directly "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! Its 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.