

LECTURE IV.

Delivered 12th June, 1924.

As you have seen, the methods of Spiritual Science seek in agriculture, as in other matters, for a comprehensive vision over a wide range of the character and activity of spirit in Nature, whereas a materialistically inclined science has entered more and more into small units and restricted spheres. Even if in agriculture the units concerned are not always of microscopic order as in some of the other sciences, yet agriculture usually concerns itself with the workings within restricted spheres and with what can be inferred from these limited observations. But the world in which man and other earthly creatures live can by no means be judged from a narrow standpoint.

To adopt this standpoint as is done by contemporary science in relation to agriculture is, in view of the real facts of the case, rather like attempting to gain knowledge of the whole being of man by observing his little finger and the tip of his ear, and trying to reconstruct the whole from these two features. We must oppose to this - and never was the task more necessary than today - a real science which will go out in search of the wide range of cosmic relationships. How greatly the scientific ideas current today or, at any rate, a few years ago, stand in need of correction, can be seen from the absurdities which not so very long ago prevailed in the matter of human nutrition. Everything was very scientific - it was all scientifically proved and no objection could be taken to any of the facts adduced. It was taken as scientifically proved that a man weighing from 70 to 75 kilograms required about 120 grammes of protein a day. This was regarded as scientifically established. Today no man of science would give credence to such a proposition. Everyone knows nowadays that 120 grammes of protein are not only not necessary but would actually be harmful, and that man is at his healthiest when he is taking about 50 grammes a day. In this case science has corrected itself. It is known today that if too much albumen or protein is consumed, it produces poisonous by-products in the intestines. If we examine not only the particular periods in the man's life when albumen is administered to him but his life as a whole, it will be found that the hardening of the arteries (arterio-sclerosis) which takes place in old age can be attributed primarily to the poisonous effects of overdoses of albumen. Scientific investigations of man, for example, often go wrong because they only take account of the moment. A normal human life lasts longer than ten years and the harmful effects of the seemingly beneficial causes which they seek to promote often do not emerge for a long time. Spiritual Science is less likely to fall into such an error. It is true, I do not wish to echo the facile criticism so often levelled at science today on account of such rectifications as I have just exemplified. I can see quite well that this rectification was necessary. But on the other hand it is equally facile to fall upon Spiritual Science when it seeks to enter practical life, because it is obliged to lay stress upon the larger connections of life, and because its eyes are open to those more attenuated forces and substances which play into the spiritual, and not merely to the coarser forces and substances of matter.

This applies in every respect to agriculture and particularly to the question of manuring. Now the very phrases used by scientists in dealing with this question show how little they understand of the significance of manure in the economy of Nature. A phrase very often used is: "The manure contains the nourishment for the plant." I mentioned the subject of nutrition earlier just to show you how science has of late been obliged to review its own position on the subject of human nutrition. Science had to correct its own errors because it started with an erroneous view of the nutrition of anything living.

The old view was, if I may express myself quite freely - I hope you will not be offended - that the most important thing about nutrition was what one ate every day. 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 forces which it contains in itself and thus stimulate the body into activity. The greater part of what is taken up as 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 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 and only 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), passage through the organism, excretion." What is absorbed through the digestion on the other hand 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.

Now it really makes one despair when, in face of this truth, which is the simple outcome of spiritual investigation, one sees the attitude adopted by modern science which maintains precisely the opposite view. One is tempted to despair because it makes one see how difficult it is to find any meeting-ground whatsoever with modern science, on all the most important subjects. Yet such an understanding will have to come, otherwise where its views were applied to practical life science would simply lead us into a blind alley. For science is unable to understand certain things even when they are under its very nose. I am not speaking of the experimental side of science. What science says here is, as a rule, true. The experiments have a definite value; it is the theorising about them, which is bad. And it is unfortunately on these theories that suggestions for practical application are based. All this makes one realise the difficulty of finding a meeting-ground. However, an understanding will have to be reached and in the most practical spheres of life, among which we must reckon Agriculture.

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.

To make the matter clearer let us take the case of a tree. A tree is different from an ordinary annual plant which remains at the merely herbaceous stage. It surrounds itself with rind and bark, etc What then is the fundamental nature of the tree as opposed to that of an annual plant? In order to answer this question, let us compare - the tree to a mound of soil which has been piled up and is exceptionally rich in humus, i.e. which contains an exceptionally large quantity of more or less decomposed vegetable matter, and includes perhaps some decomposing animal matter as well (See Diagram No.7). Let us assume that this is the mound of soil, rich

in humus, and I will make in it a crater-like depression; and let us take this (Indicated in the second part of the drawing) as the tree, the more or less solid part being outside, while inside grows that which goes to build up the tree as a whole. It may strike you as strange that I should place these two things side by side, but they are more closely related than you may perhaps think. The reason is that soil such as I have described, soil containing plenty of humus, i.e. substances in course of decomposition, bears etheric life within it. And this is the point. When soil is so constituted as to have etheric life within it, it is on its way to becoming the outside covering of the plant, but does not in fact develop so far as to become bark. Now imagine (although, of course, this does not happen in Nature) that such a mound of soil, with its humus content has, by means of its etheric life, raised itself to a higher form of development and wrapped itself round the plant. For if any part of the earth is raised above the general level, if the outer separates itself from the inner, then that which is raised above the normal level will show a definite tendency to life, a distinct tendency to be penetrated with etheric life. This is why, if you want to make inorganic soil more fertile by mixing it with humus-like substance or with any sort of decomposing refuse, you will find it easier to do so successfully if the soil is heaped up into mounds. For then the soil itself will have the tendency to become inwardly alive and plant-like. The same process takes place in the formation of a tree. The soil bulges upwards, as it were, and surrounds the plant with its own etheric life. Why do I say this. The reason is that I wish to waken your consciousness to the fact that there is an intimate kinship between what is enclosed within the contours of the plant and that which comprises the soil round the plant. It is untrue that the life of the plant stops short at its outer sphere. The actual life is continued, particularly from the roots, into the soil and in many cases there is no sharp boundary between the life within the plant and that in its immediate environment. In order to have a fundamental understanding of a soil which is manured or similarly treated, one must know that manuring consists in a vivifying of the soil so that the plant may not be planted in dead soil. A plant will more easily develop from its own vitality, for what is necessary for fruit formation, if it is planted in something already alive. Fundamentally all plant growth is slightly parasitic in character; it grows like a parasite on the living earth. And it must be so. In many parts of the earth we cannot rely on Nature herself to supply a sufficient quantity of waste organic matter to enable the soil adequately to revivify itself by decomposition of such matter. In those places, therefore, we must assist the growth of plants with manure. This necessity, however, arises least of all in districts containing so-called "black soil", for here Nature herself has seen to it that the soil is sufficiently alive.

You will see from all this what is really happening; but there is something further which must be understood. One must learn - and this may not always be pleasant - to enter into a personal relationship with everything that comes within the sphere of Agriculture, and particularly with the work connected with manure and manuring. The job may seem to be an unpleasant one, but you cannot do without this personal relationship. Why? Well, if you consider the nature of any living being, you will find the reason. Every living being always has an inner and an outer side. The inner side is inside some kind of skin, the outer side is outside that skin. Let us begin with the inner side.

The inner side of every living thing has not only streams of force which go outwards in the direction shown by these lines (see Diagram 8) but it also has streams of force which go inwards from the skin, which are pressed back. Now an organism is surrounded on the outside by streams of all kinds of forces. There is something which expresses very exactly although in a "personal" way the relationship which must be established by the organism between its inner and outer side. All the forces

working inside the skin, all that stimulates and maintains life, must - pardon the phrase - inwardly smell, must have an inward stench. Taken as a whole, life itself consists in this that what is generally diffused as a scent is instead held together so that the scent is kept inside and does not stream outwards too strongly. An organism must therefore allow as little as possible of its scent-producing life to escape outwards through its skin. Indeed one might say that the healthier an organism, the more it will smell inwardly and the less it will smell outwardly. A living organism and particularly the plant organism (apart from the flower) is designed not to give out scent but to take, it in. And if we consider the beneficial influences on a meadow full of fragrant aromatic flowers, we shall begin to notice how living things mutually support one another in Nature. This fragrance of flowers which is diffused and which is something different from the odour of mere life, issues from sources of which we shall become aware later, and it acts on the plants from outside. One must enter into a personal, living relation to all these things; only then are we really one with Nature.

Now the main thing to understand is that manuring and the like must consist not only in conveying a certain degree of aliveness to the soil, but also in enabling the nitrogen to spread through it, in such a way that with its help the life is carried along certain lines of force as I showed yesterday. In manuring therefore we must bring sufficient nitrogen into the soil to enable the life to be borne into the organic structure of the soil which is to bear the plant. This is the task, but it must be carried out exactly and properly.

Now here is a very significant hint: when purely mineral matter is used for manure, it never reaches the earth element, but at best only the water element in the soil. You can produce with mineral manures an effect in the watery part of the earth, but you will not achieve a vivification of the earth element itself. Plants, therefore, which are under the influence of any sort of mineral manure will exhibit a type of growth which betrays that it comes from water which has been activated, not from the solid element which has been vivified. The best way to approach these things will be to take the most unassuming and often despised kind of manure, viz. compost. Here we have a means of vivifying the soil. We include in compost all kinds of neglected refuse from farm or garden, mown grass, fallen leaves, and the like, nay, even to the remains of dead beasts, etc. These things should by no means be despised, for they retain something not only of the etheric but even of the astral elements. And that is important. In a compost heap, all contained in it is actually pervaded not only by living and etheric but also by astral elements. These are present to a lesser degree in solid or liquid animal manure, but they are more stable, more settled - especially the astral element only we must make use of this stable or settled character in the right way. The action of the astral element upon nitrogen is hindered wherever the etheric element is too ebullient.

A too powerful sprouting of the etheric life hampers the astral element in the compost heap from doing its work. Now there is in Nature a substance which I have already mentioned from varied angles which is extremely useful in this respect, and that is the chalky or limestone element. If, therefore, some of this - preferably in the form of quicklime - is introduced into the compost heap, we get the following special result: without causing the astral element to "volatilise" as it were too much, the etheric element is taken up by the quick-lime and the oxygen is absorbed as well; In this way, the astral element is brought to a wonderful activity. This leads to a very definite result: In manuring the soil with compost, we are giving over to it something which has the tendency to carry the astral element directly into the solid element without the detour through the etheric element. In this way,

therefore, the earthly element is thoroughly "astralised" and thereby becomes penetrated with nitrogen. This result, indeed, very much resembles a certain process in the human organism - a plant-like process - so plant like in fact that it does not proceed to fruit formation, but stops at the stage of leaf and stem formation. What we give over to the soil in the compost has its parallel in that process which brings about in the food we eat that "mobility" of which I spoke before (see para 7 & 8 of lecture 3). We bring about a similar activity in the soil when we treat it in the manner described. Soil prepared in this way will be especially suitable for producing plants which, when they are eaten by animals, will continue to bring about a similar activity in their organisms. In other words, we shall do well to manure our meadows and pasture lands with this compost, and if we carry through the process carefully, with strict regard for the other proceedings and ingredients, we shall succeed in obtaining good fodder, which, when mown and dried, preserves its quality. I should like to remind you that to take the right steps, one must look into the nature of the whole process, and finding the right thing to do in any particular case will, of course, depend to a great extent upon having the right feeling. This feeling, however, develops, when we look into the whole nature of this compost process. For instance, if the compost heap is left alone the astral element in it will begin to spread in all directions. It will then be a question of developing the right personal relation to the heap in order to find out how it can be made to retain its smell within it. This can easily be done by putting down a thin layer of the compost material and covering it with peat moss, then adding another layer and so on.

In this way we hold together that which would otherwise volatilise" itself as smell. Nitrogen, indeed, is a substance which in all its modifications is eager to spread out into all directions. And now it is held back, by this I wish to indicate how necessary it is to treat the whole "agricultural-individuality" in the light of the conviction that etheric life and even the astral principle must everywhere be poured out over it to make our work effective.

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 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 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 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 certain of its 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 and etheric formative forces, which then penetrate right into the metabolic system so that increased activity in the digestive organism arises by reason of this radiation from horns and hoofs. If one wants to understand foot-and-Mouth disease, i.e. the retroaction from the periphery to the digestive tract, one must know of this connection. Our remedy for Foot-and-Mouth disease is based on the recognition of this. In the horn, therefore, we have something which by its inherent nature is fitted to reflect the living etheric and astral streams into the inner life organs. The horn is something which radiates etheric life and even the astral element. Indeed, if you were able to enter into the cows belly, you would smell the current of etheric-astral life which streams 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 and etheric elements. The astral element has filled it with nitrogen-bearing forces and the etheric element with oxygen-bearing forces. The substance which emerges as dung is permeated with these forces. Imagine now: we take this substance and pass it into the soil in some form or other (the details will be dealt with later). Thus we add to the soil an etheric-astral element whose proper place is in the belly of the animal, where it produces forces of a plant-like nature. For the forces which we produce in our digestive tract are of a plant-like nature. We should be extremely thankful that we get such a residue as dung, for it carries etheric 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) 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 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 cowhorn 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 cowhorn, 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 cowhorn 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 cowhorn 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.

Now these things are derived from a wider range of experience than those which result from the point of view which would seek to construct a whole human being theoretically from his little finger. Let us not underrate the results obtained. For to tell the truth what is generally meant by making a farm productive is to make it as paying a proposition as possible. Nothing else matters very much. Unconsciously at any rate the farmer is always pleased when by some method or other he has achieved big results - big potatoes, outsizes, something inflated and swollen. His research goes no further than this. And yet this is not what matters most. What matters most is that the food which is put before man should be that which is most beneficial to him. You may grow the most splendid looking fruit in field or orchard, at it may only fill a man's stomach and not really benefit his inner organic existence. Modern science simply has not found the way to supply man with the food which will support the life of his organism.

You will see that what Spiritual Science has to say on the subject is very different, for it has for its background the whole economy of Nature. The principles are drawn from out of the whole. That is why the particular indications have a decisive bearing upon the whole. If farming is practised in this way, it cannot but result in giving the best both to man and beast. Indeed, as everywhere in Spiritual Science, the study of man is the starting-point; man is taken as the basis. Thus practical hints can be given as to how man may best sustain his human nature. This is what distinguishes our way of looking at things from those usual to-day.