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The Physical Body of the Earth.

Introduction to the Kendal Conference, 5th May 1955

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Every farmer or gardener who has read the Agriculture Course has taken that first step from looking at his place as so much land to treating it as a living organism, having an individuality of its own and its own way of life. And then comes that next step when he realises that his farm organism is only a minute segment of the great Earth Organism, and that it will be quite impossible to succeed in his work with the part without taking into consideration its relationship with the whole.

This widening of our horizon, and deepening of our understanding of the earth as a whole, and its relationship with the universe, one can see as a main theme running through these eight lectures to farmers. The note is first struck in the words at the beginning of the First Lecture: "The earth is surrounded in the heavenly spaces, first by the moon, and then by the other planets of our planetary system. In an old instinctive science, wherein the sun was reckoned among the planets, they had this sequence:- Moon, Mercury, Venus, Sun, Mars, Jupiter, Saturn. Without astronomical explanation I will now speak of this planetary life and of that in the planetary life which is connected with the earthly world."

Although these lectures to farmers direct us towards the stars, the planets, the Sun and the Moon as the source of the forces we are dealing with, we learn from other lectures and writings of Dr Steiner's that these stars are the physical representations of Spiritual Beings, and all that we see and deal with in Nature around us, with our physical senses, are the results of the deeds of the Hierarchies.

Our attention has been called to the Fifth Lecture of the cycle on "The Mission of the Folk Souls" (Christiania, June 1910). Here we find a description of the forces that are at work in the formation of the surface of the Earth. In looking at the solid ground on which we stand, we see before us what in the first place presents itself as forces which come from the centre of the Earth, and radiate into space in every direction. In this we are seeing the activities of the Thrones, the Spirits of Will - they radiate their forces through the centre of the Earth out towards the circumference. Here they are met by other forces streaming in towards the Earth from all sides of universal space, and these are the activities of the Spirits of Movement. The sphere of the instreaming forces meets incessantly that of the outstreaming forces, and where they come together, they form a boundary, which is the surface of the Earth.

This polarity of forces working in the soil is, of course, of the utmost importance to farmers and is

dealt with in the Second Lecture of the Agriculture Course. The words are familiar to all of you:-

"All that works inward from the far spaces of the cosmos to influence the growth of plants, works not directly, not by direct radiation, but in this way:- It is first received by the Earth, and the Earth then rays it upwards again. Thus the influences that rise upward from the earthly soil, beneficial or harmful, for the growth of plants, are in reality cosmic influences rayed back again and working directly in the air and the water over the Earth. The direct radiation from the cosmos is stored up beneath the Earth's surface and works back from there. Now these relationships determine how the earthly soil, according to its constitution, works upon the growth of plants."

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

"The way the soil itself grows inwardly alive and develops its own chemical processes, depends above all on the composition of the sandy portion of the soil. What the plant-roots experience in the soil depends in no small measure on the extent to which the cosmic life and cosmic chemistry are seized and held by means of the stone and rock, which may well be at a considerable depth beneath the surface. \*

"Therefore, wherever we are studying plant-growth, we should be clear in the first place as to the geological foundation out of which it arises."

If we seek to learn some thing about the origin of the geological foundations of the Earth the geology books cannot help us very much. Grenville A.J. Cole, in his charming little book 'Common Stones' has a chapter on 'The Search for the Foundation Stones'. He asks the question

"Were they not laid down as primitive sediments from a hot sea in the early days of the earth's consolidation? Were they not the true foundation stones? Associated with them were the great series of 'foliated stones', those known as schists and gneisses".

However, he end by quoting the words of the great geologist Hutton who said 150 years ago: -

"In the economy of the world I can find no traces of a beginning, no prospect of an end."

Holmes in 'Principles of Physical Geology (19+, p65) says:-

"According to the accepted theory that the earth was originally in a fluid state, the first rocks of the crust must inevitably have been igneous. However, none of these primordial rocks has ever been discovered. The oldest igneous rocks that can be found are seen to be intrusive into St. older rocks which though now metamorphic, were originally sedimentary.... all the observed igneous rocks have consolidated either from magmas that ascended from the depths, or (at least in part) from magmas that were generated within the crust by the fluxing action of heat and migrating fluids on the materials already there."

So the geologists speak of a generally accepted theory that the Earth was at one time in a fluid state and that as the exterior cooled and hardened the first material to appear was the quartz rocks, and following that the schists and foliated rocks, then the limestone, and the carbon and so on. This, in general, except for the time at which it was supposed to happen, agrees with that picture Dr Steiner gives us when he describes the earthly conditions at the end of the Lemurian Epoch and the beginning of Atlantis, when the Earth was first beginning to take on physical form. In the Second Lecture on 'The Mysteries of Ephesus' (Dornach, 1923) we read :-

"The first thing to be formed and fashioned in the Earth from out of the cosmos....is the primeval mountains. The quartz that is found out there in the primeval mountains, in its beautiful form, in its relative transparency, was formed in the Earth from out of the universe. . . . . But this quartz (we are told) this silica, which in that earlier time permeated the whole atmosphere and was gradually deposited, and formed the primeval mountains, was not so hard as it is today. Because of the life which pervaded everything it was very little harder than wax..... In this way did these ancient mountains insert themselves from out of the cosmos into the Earth as a kind of wax substance, tricking in and then gradually hardening."

What is described here is a recapitulation of the Old Saturn period of the Earth's evolution. This is followed by a recapitulation of the Old Sun epoch, when the germs of the plants appeared in the Earth's environment. So we read :-

"When such silicates in the wax-like condition began to condense one could distinguish in them something like a kind of plant form. Plant forms would shoot up, not actual plants yet, but reflections and radiations of light. Cosmic plant forms reflected in the silica, shooting up then fading away again."

In the Second Lecture of the Agriculture Course Dr Steiner refers to this reflecting quality of silica, how it receives the light into the Earth and makes it effective there. And in other lectures the quartz is spoken of as the eyes through which the cosmos looks into the Earth. The whole of the starry heavens is reflected there in the quartz crystals.

To continue with the story of the coming into being of our solid Earth as told in the Ephesian mysteries; there was at this time in the environment of the Earth an atmosphere of infinitely fine fluid albumen of a consistency midway between water and air. This substance was not divided into separate elements, carbon, hydrogen, nitrogen and oxygen. It was, however, permeated with cosmic ether and thereby quickened into life.

Behind these conditions we can see the workings of the Hierarchies. The cosmic plant forms or pictures reflected by the silica in the Earth out to the circumference, and the albumen working from the surrounding atmosphere inwards. And where these two meet the solid forms arise.

So it was in these earliest times; the silica, named in the Agriculture Course as the collector of the cosmic chemistry, draws the albumen into the plant forms and they become thereby harder and denser, the albumen coagulates. They were then no longer pictures, the silica element fell away from them and was strewn abroad in the rest of the atmosphere and these great plant forms are then floating in the albumen out of which they received their substance.

"In this way" says Dr Steiner, we can get an idea of how the silica of the Earth drew to itself, drew into the Earth the plant forces, which are outside in the cosmos, for the plant world really came down in this way to the Earth from the cosmos."

After Lemuria comes Atlantis, and the appearance of the sort of plants and animals and solid matter that we have around us today, and the remains of which the geologists find. First a recapitulation of Old Saturn when the quartz and crystalline rocks are formed, then old Sun when the plants take root in the Earth and the schist formations are deposited, foliated like a leaf mould or compost, the residue of these first plants. Follows a recapitulation of the old Moon, during which the limestone came with the animals,

Whilst we are speaking of schists I should like to refer to a lecture Dr Steiner gave at Dornach (2/7/22), called in the English translation "The Countenance of the Earth'. It is most pertinent to our subject. Here are a few extracts relating to schist:-

"It will only be possible to find an explanation of what constitutes the schist element of the Earth if we are able to return, as explained in my 'Occult Science' to that epoch when the Earth itself had a Sun existence. It was at that time that the schist elements in the Earth were prepared - not yet formed in its present shape but prepared - ..... Our present plants did not exist during the Sun existence, but the Earth itself had a kind of vegetable life, and out of this life arose, on the one hand, the plant world. On the other hand what is contained in the plant world as formative forces hardened and became schist."

Then we are told of the importance of the schist forces for the plant world of today:-

"The plants contain no astral body, but the Earth is surrounded by an astral atmosphere.

The astrality co-operates in the development of flowers and fruits. The whole vegetable world of the Earth consequently possesses an astral body in common, which penetrates nowhere into the plant itself - at the most it enters slightly when the flower undergoes fructification - and essentially floats over the plants in the form of a cloud, stimulating them to develop blossoms and fruits."

"What thus develops would necessarily perish if there were no radiating forces emanating from the minerals of the schist strata. Hence the schist formations constitute all that strives to convert the whole Earth into an organism. In fact we should look upon plants in connection with the Earth in the same way in which we look upon our hair in connection with ourselves as human beings - that is to say, as a whole, as a unity. What holds together this entire organisation of the Earth are the radiating forces emanating from the minerals of the schist strata..... Radiations emanate from the schist strata; they are carried over the Earth by all kinds of currents, particularly by magnetic currents, and the plants' life depends on these radiations of the schist formations which are over the Earth."

Then Dr Steiner draws our attention to the connection between the schist element and silica.

"In many schist formations we find silicon, silicious matter, which is contained particularly in the rock crystal, in quartz."

If the geologists cannot tell us about the origin of the Earth, they can tell us a great deal about rock changes and even a kind of rock generation, great life processes that we can see for ourselves, as they are going on all the time and can be scientifically demonstrated. Here is Holmes' description of how the ancient slate-like deposit, schist, is transformed and brought to the surface and made available for the use of the plants:-

"In the alchemy of Nature, migrating fluids from the depths soak into the schists, adding certain new ingredients and carrying away some of the old ones. As a result of this chemical interchange, the schists themselves are changed in composition, migmatites are formed, and the final product is a granite rock. Moreover, there is growing evidence that locally the newly born granite material became mobile and fluid. Consequently we have here a most important clue as to one, and perhaps the most important - of the ways in which the granite magmas have been generated."

It is interesting to see here again silica acting the part of collector, carrier, or one might say the usher, marshalling the elements up towards the surface of the Earth where they can be used by the plants. We shall come back later to what the geologists have to tell us of these mineral-bearing, migrating fluids of the Earth's circulatory system.

I want here to refer to the book 'Spiritual Science and Medicine'. Dr Steiner is speaking to doctors

and of course the processes at work in man, but a lot of what is given in these twenty lectures has an important bearing on our work as farmers. Thus, in the Ninth Lecture (p. 126):-

"take as a concrete instance the processes proper to silicic acid (silicon). These forces are especially conspicuous wherever silicates are being formed, as quartz or similar minerals. They have their counterpart within the human organism - and it is these processes which extend their work to certain occurrences which receive far too little attention at present - within the soil between the arable soil and the silicious element in the Earth on the one hand, and those plant organs which grip the Earth, the roots."

It is interesting to see what P.H. Hainsworth in his book 'Agriculture, a New Approach' (Faber, 1954) has to say about silica:

"Silicon has the unusual property of assisting the plant to extract other minerals from the soil without appearing to be an important element of nutrition itself."

So the soil scientists are becoming aware of the significance of silica in agriculture.

As carbon is counted the philosophers' stone in the organic world, silica might be said to be the philosophers' stone of the inorganic. For there is a very real relationship between silica and carbon, a relationship which is at the same time a polarity. In the Medical Lectures mentioned above, Dr Steiner depicts it this way:-

"We find the polarity to the formation of silicates in external nature..... The complete opposite to silicon formation is contained in all that we will term the process of carbon dioxide formation in external nature. The two are in certain respects true polarities."

Then, as Dr Steiner is speaking to doctors he gives an illustration of these two processes in man.

"The formative process of intestinal evacuation is in effect a human copy of the silicious process, and the process of urine formation is a copy of the carbonic acid process.....If we speak one hand of the silicon principle as the force which forms us, and of the carbonic acid principle as the force that dissolves us - this perpetual tendency to mould, to dissolve, represents the process of life."

It is this process of life that we must look for in our soil. The silica astringent, contracting, peristaltic, as when it impelled the albumen into the plant pictures at the end of Lemurian times, or again in the present day collecting the minerals and urging them into the plant roots that grip the Earth. The carbonic acid process, on the other hand, is a percolation, or filtration, water coming down as rain.

Rainwater as it falls takes up a slight amount of carbon dioxide from the air and from decomposing matter in the Earth, and the carbonic acid thus formed attacks the rocks exposed at the surface of

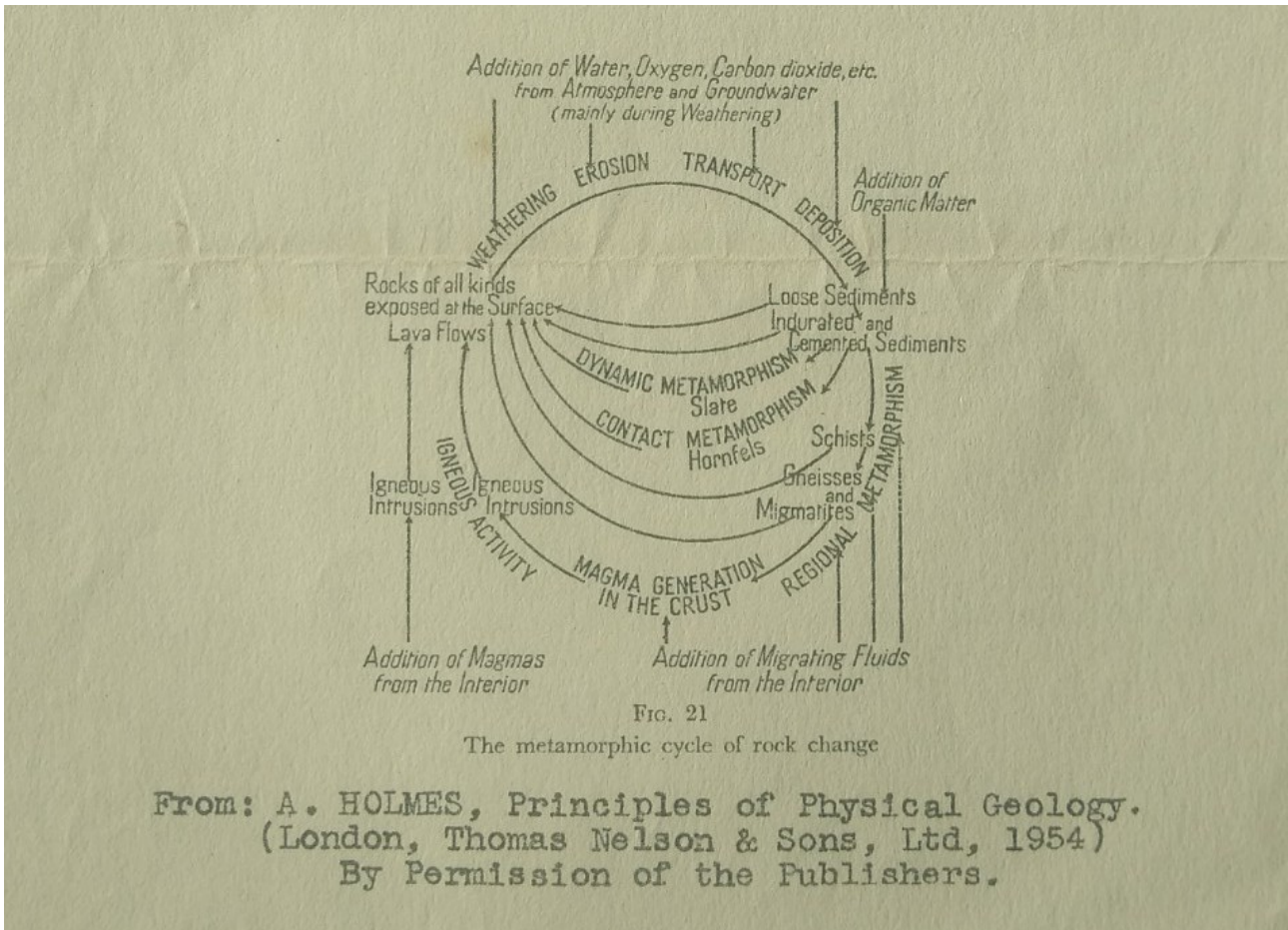
the Earth. Through its chemical action on the binding material it disintegrates the crystalline forms built up by the silica. The carbonic acid has no power on the silica itself, the quartz grains are too hard. When a granite mass breaks down, it is the potassium-sodium felspar that is disintegrated, the grains of quartz are cast aside and form the sandy portion of our soil, whilst the minerals that are washed out are liberated to become food for the growing plants, or to return into one or another of the great circulatory systems of the Earth. This gradual decay and disintegration, weathering as it is called, is continually going on wherever the surface of a rock is kept wet with rain or moisture. It is the carbonic acid process and whilst it is most active and most in evidence at the surface of the Earth, under normal conditions it may, and does occur several hundred feet deep below the ground, and under exceptional cases, as much as, or possibly more than, half a mile down in the rocks.

In 'A Handbook for the Mineral Collector' (Dake, Fleener and Wilson, New York 1938) the subsequent journey is described in this way:-

"As the water slowly finishes its way down through the felsparic rocks, it picks up more and more colloidal silica as it descends. The farther down it goes, the greater become the temperature and the pressure to which it is subjected, this in turn increases its carrying capacity. Finally, it eventually becomes so thoroughly saturated with the substance that it can absorb or carry no more. It is in this condition and by this means that the silicious material may be transported to a considerable distance from its place of origin. . . . . It is true, also, that in their downward movement, ground waters eventually reach a stage, down, deep within the very 'bowels' of the earth, where they must come in contact with the forces of volcanism. By these associations their nature and even their properties are greatly changed, as they mingle with and dilute the magmatic waters derived from the cooling igneous magma."

In all this we can see the silica guiding the surface water with its burden of minerals into that stream of forces working from the cosmos through the centre of the Earth and out towards the circumference. During its passage upwards again through fissures and faults in the rocks it reaches zones where as a result of falling temperature it is unable to carry its burden further, with the result that precipitation and crystallisation again take place. By igneous activity and the flow of migrating fluids some of this rejuvenated water, or 'Juvenile Water' as the scientists call it, is brought into surface circulation.

In Fig. 21 in Principles of Physical Geology! Holmes gives an illustration showing these metamorphic cycles of rock changes.



In this diagram it will be noticed that all the arrows pointing downward towards the surface of the Earth are representative of the carbonic acid process - the works of the Second Hierarchy - the Spirits of Movement and the Spirits of Wisdom. The elements they work in are the water and the air in all kinds of weathering, erosion, and chemical action. The arrows pointing upward towards the surface of the Earth are representative of the silica process, the works of the First Hierarchy, the thrones, the cherubim and the Seraphim. They work through the elements of Fire and the Earth, on vulcanism and crystallisation.

Where these forces meet the solid forms arise and this is an act of creation on the part of the Spirits of Form. Their influence penetrates upwards as well as downwards - into the sphere of the Spirits of Will as well as into the sphere of the Spirits of Movement. We read of this in the series of Lectures on 'The Secrets of the Biblical Story of Creation' (Munich, August 1910) p. 53:

"If we penetrate beyond material existence, we must face the spiritual coming to



existence, the activity of a foundation substance which is none other than the bodily nature of the Thrones permeated by the activity of the Spirits of Form ..... In the impulse towards the crystal shapes in our surroundings, we have at a lower stage, those forces... which weave and rule within the substance of the thrones as the Elohim, the Spirits of Form. Here they are active smiths in the heat element, Forging out of the formless substance of the Spirits of Will the crystalline forms of the various minerals and metals."

I should like to conclude with a reference to a series of lectures Dr Steiner gave in 1918 on 'The Fundamental Demand of our Time' in which he speaks very seriously about a change that is taking place in the Hierarchies, for the Hierarchies also evolve. The Spirits of Form are handing over their work as creators to the Spirits of Personality. The Spirits of Personality rise to a creative activity. This means that Man will henceforth confront an altogether changed world picture. That in Man which proceeded from the Spirits of Form as the creative spirit is beginning to die. A new creative essence must now be instilled into human nature - through new revelations which are coming to us from the Spirits of Personality,

"From this point onward it is necessary to turn to the new revelation of the Spirit and to conceive the Spiritual Worlds with the same clarity with which we have been accustomed to conceive the world of Natural science... Anyone who fails to understand in this sense the task of Anthroposophical Spiritual Science, understands it not at all."

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