

Wholistic™ Horn Clay

Preface

Wholistic™ Agriculture is the next step in the evolution of Rudolf Steiner's Agriculture. In fact, it is the **most advanced** form of agriculture in the world today.

In 1928, four years after his famous lectures entitled *Spiritual Foundations for the Renewal of Agriculture*, the term Bio-Dynamism, later Bio-Dynamics, then recently shortened to simply Biodynamics was born. Biodynamics is about 10% Steiner's ideas put into practice and 90% traditional European farming practices.

Since 1993, with the evolution to and development of **Wholistic™ Agriculture**, the world now has a far more advanced interpretation of Steiner's ideas. **Wholistic™ Agriculture** is 80% Steiner's ideas, 10% Dr. George Washington Carver and Luther Burbank and 10% common sense agriculture.

The antiquated, cumbersome, misunderstood and expensive practice of Biodynamics is still of interest to some people. But, for all intents and purposes, **Wholistic™ Agriculture** completely replaces Biodynamics just as today's modern jet replaces the horse and buggy for transportation.

Biodynamics, since it is largely a misinterpretation of Steiner's ideas, has never advanced or evolved from an expensive, mystical and generally misunderstood belief system into a highly advanced farming **science** as **Wholistic™ Agriculture** has.

Steiner's, Burbank's and Carver's wisdom, insights and science are wrapped into the wisdom and insights of Greg Willis, M.A. generally recognized as a genius and arguably the most scientifically and metascientifically advanced agriculturist in the world today. Greg Willis is the Plant Master. **Wholistic™ Agriculture** is the savior of agriculture.

Since 1928, many have sought to create Horn Clay. In 1996, Greg Willis revealed to the world how to make it. Below is the description of the process and the thoughts supporting its use.

Copies of several books on **Wholistic™ Agriculture** can be downloaded for free at www.theccdsolution.com.

Technical Data

We make four kinds of Horn Clay. We use bentonite clay because it is available and already ground to a powder. We pack it in the horns exactly the same as horn silica. We call it #509.

We spray a Spring to Fall Horn Clay that is applied in the Spring; a Fall to Spring clay that is applied in the Fall; a Spring to Spring clay (one year in the ground) for new Spring applications; and a Fall to Fall Horn Clay for new Fall applications. These latter two would be for new fields and fields in a state of severe neglect. Thereafter use the six month clay started at the same time as the spray application. The year is divided into Spring and Fall by the summer and winter solstices.

Mix a rounded 1/2 teaspoon per acre in rain water or solarized water and stir for 60 minutes, then apply. For soils deficient in clay, we use a rounded full teaspoon per acre. You will find that a double application will be far more effective than one double strength application.

Horn Clay will stay active for a minimum of 3 hours and has a residual effect of about six months, so it is well to apply it twice a year.

Commentary

Horn Clay is very important to the success of the application of the preparations. Without the Horn Clay, it is simply not possible for the Steiner's system of preparations to reach its fullest potential. The misuse or lack of use of Horn Clay over the years since the original lectures has had a very limiting effect on the progress of biodynamics. Clay works to connect the concepts in the human mind just as it works to connect the effects of silica and clay. Those who do not use it do not benefit from the complete understanding of the what the Universe has to offer. So the lack of use of clay, or Horn Clay, has

a limiting effect on the benefits and the understanding of the basic system.

Clay plays the part of the mediator, in a sense, like water. It acts to connect the various disparate elements of Nature into a coherent whole. Without the action and activity of clay to hold it together, it is not possible for the various elements to carry out their respective duties.

How does this come about? Let us look at clay more closely. You will notice that it has a very strong positive and negative bonding properties. These properties are representative of the nature of clay. It holds together or bonds the various elements so that they can work together. It is, in a very real sense, the glue that binds the soil together. Without this glue, it is not possible for soil to gain the kind of structure, both physical and etheric, necessary for a plant to properly exist. This structure, emblematic of the structure of the Universe, is what holds soils together. So we see that the nature of clay is that it binds and connects, both at once. These physical realities or observations work exactly in the same manner in the astral and etheric worlds. All work together.

Why is it important to make Horn Clay? This too is very much like the other remedies. It is important to at once conserve and utilize the homeopathic properties of the clay. Bentonite clay is more than adequate to do the job. Other local clays work very well too.

The Horn Clay works homeopathically as do the others. By placing the clay in the soil as you would horn silica, you are greatly increasing its power to radiate its spiritual properties over large areas. So it is at once more efficient and more beneficial for all the same reasons the silica and cow manure are placed in the horn first.

The presence of Horn Clay in a field will bring together or bind the various disparate elements that you are applying. This is the genius of God. By further preparing the Horn Clay as you would the BD 500 and BD 501, you are creating a sympathetic presence in the field as well.

The Horn Clay that is prepared in the Fall to Spring gets applied in the following Fall. The clay that is buried in the Spring to Fall is applied in the following Spring. The clay that is set in the soil in the Fall and kept there for a full year is best used remedially as a Fall application in fields that are in a state of severe neglect. This would be the Horn Clay of choice to begin. The same may be said of the one year old Spring Horn Clay. Apply the following Spring.

After you have created an inventory of the four Horn Clays, you will see that the one year old clay works best as a beginning clay and the six month clay works best for better agricultural areas which have experienced the BD approach for some time. Then and only then will you be using the six month clay.

In other words, the one year clay first, the six month clay as time goes on.

Horn Clay may be stored like the BD 501 in a glass bottle in the window or it may be placed in the dark. But it is best to place it in a bottle, not plastic. It has a life expectancy of at least five years. It may be reactivated by placing it in the ground at solstice time (either one) for about a week. Place it in the ground in a glass container only without a metallic lid. It would be best to place it in the ground with jar with a cork lid. One week is sufficient to recharge the clay for another year. Much more cannot be expected.

Further Commentary

Horn Clay should be clay. Bentonite will do but others are in many ways just as good. You need to experiment. Do not use feldspar or Kaolin as the clay medium. They are too close to silica and not far enough away to do much good.

The difference between the Horn Clay and BD 500 and BD 501 is that it should be placed in the ground for the entire year. It must experience all the facets of the sun, the moon and the Earth as she rotates and revolves around the sun.

The Horn Clay works to mediate not just between the silica and the limestone, it mediates between the physical, astral and the etheric. In many ways it is similar to oak bark (BD #505). Though oak bark is rich in calcium, it is also rich in the astral energy necessary to bring the plant into bodily form. It works the same way with the soil. It brings it and all that live within into bodily form too. Even the worms, insects, and bacteria among all the others. Everything is effected by the strong astral energies of the oak bark. Thus it can also be used to enhance the areas that have been devastated by methyl bromide and other life killers in the soil. It can be mixed with 500 for this purpose.

Horn Clay is best applied in the Spring time. That does not mean that it cannot be applied at other times of the year. Do so only at the full moon days - three before and three after. Morning or evening it does not matter.

It is not necessary to worry about whether or not it will rain with regard to the Horn Clay. Apply it. No problem unless it is raining at the time in a steady rain. Unlike the other BD preparations, the clay actually enjoys a little rain at the time it is applied. It works to bring together all the astral and etheric qualities in the plants, the soil and the air and water. It actually thrives on water. Notice how "bloated" clay gets in water. It loves it.

Between the Horn Clay and the #800 Stinging Nettle - Basalt tea, you have two of the most important mechanisms developed to bring the kind of harmony and balance and healing to the vines that you need to do.

Horn Clay

Horn Clay has changed EVERYTHING. EVERYTHING! Nothing is the same any more. NOTHING. It's a good start. Horn Clay has doubled now the effectiveness of Steiner's Agriculture in one swoop. We have a long way to go.

Horn Clay is the single most important advancement in Steiner's Agriculture since its inception.

There are three points that must be made about Steiner's Agriculture and the efficacy of the practice.

First, the state of conventional agriculture today is bad, very bad. Among other problems, the chemicals and poisons used throughout agriculture, not just viticulture, have been linked to higher cancer rates, the destruction of our soils and the dependence of the farmer on outside sources of supply for his livelihood.

The lack of spirituality in agriculture is what brought us to this present day disaster. If no other point is to be made, this is it. Lack of spirituality, like dominoes, begins the fall cascading throughout all facets of agriculture from seed producing through planting, caring, harvesting processing and ingesting. Without a more spiritual approach, there may well be a total collapse of agriculture worldwide in the next 50 years.

Secondly, Steiner's Agriculture is not just woo woo. It is a practical approach to a difficult problem that works. It is not so much necessary that people understand it as that they do it. Understanding will come it time. The most important first step is to do it.

Third, it is important to consider the relationship between man and plants and to realize that all plants have a role or a function in the Universe and that knowledge of this frees mankind from the perils of ignorance and deception so prevalent in the world today. A spiritually enriched mix of food, vegetables, nuts, fruits and herbs, gives one the physical and spiritual strength to be happy and live problem and disease free without the burden of chemical additives which destroy the immune system and work counter to the will of the individual.

The field sprays and compost preparations discussed by Dr. Steiner in 1924, while still very effective, in fact, essential to the survival of the world were a beginning. In fact we are learning that the BD preparations can be used in other ways than originally discussed. These ways include the many ways that can be gained by insight and intuition. The process of Steiner's Agriculture is a process that is evolving too. It was, in 1924, a beginning, not an ending.

Steiner's Agriculture is, can and should be dynamic, not static. Orthodoxy does not hold up under the scrutiny of experimentation and evaluation. Other Steiner inspired techniques can and will be discovered. It is essential for all Steiner's Agriculture practitioners to know this and to internalize this belief in their practice. Stagnation does not lead to discovery. And Steiner's Agriculture has truly stagnated on a spiritual level.

Much research has been done, to be sure. But this research explains only the "how", not the "why". The gift of intuition, or spiritual insight, is a Gift of Spirit, a Gift of God, a Gift of Creation. EVERYTHING is discovered through insight and intuition. EVERYTHING. The Creator leaves nothing to chance. "God does not play dice with the Universe." The Laws of Creation have deep meaning and deeper significance to all facets of life. It is imperative that every soul use his or her God given birthright to use their intuition and spiritual and learned insights to further the advancement of this science. Stagnation leads to orthodoxy. Orthodoxy is ankylosis. Rigidity. Dogma. It is time we tried some innovative approaches, some new remedies and some new ways of using the remedies that we have.

So now let us look at Horn Clay and how it fits into a Wholistic™ Agriculture program.

THE AGRICULTURAL COURSE

Much has been discussed about Horn Clay, as I understand it, since the beginning of Steiner's Agriculture. Steiner referred to the importance of clay in his lectures on agriculture. Martin W. Pfeiffer commented on it in his

booklet “The Agricultural Individuality, A Picture Of The Human Being”.

p. 47 “To these eight preparations, which have been explained in detail with regard to their making as well as to their applications, a further indication by Dr. Steiner suggests a possible ninth preparation, clay. ‘That which pours down from the cosmos is caught up beneath the surface must be able to pour upward again. And for this purpose is the clayey substance in the earth.’ For soils which do not have this possibility of streaming upward, ‘it is well to add a dose of clay to the soil.’”

Let us look further at references to clay from two different translations of the lectures, one by Adams and the other by Gardner. We will read PARALLEL PASSAGES:

From the Adams translation:

p.32 “In a word, that which pours down from the Cosmos is caught up beneath the surface must be able to pour upward again. And for this purpose is the clayey substance in the soil. Everything in the nature of clay is in reality a means of transport, for the influences of cosmic entities within the soil, to carry them upward again from below.”

From the Gardner translation:

p.31 “What is collected down below from the cosmos must always be able to stream upward, and the presence of clay in the soil makes this possible. Substances like clay support the upward flow of the effects of the cosmic entities in the ground.”

Adams translation:

p.32 “However else clay may be described, however else we may have to treat it so as to make it fertile - all that, no doubt, is most important in the second place, but the first thing is to know that clay is the carrier of the cosmic upward stream.”

Gardner translation:

p.31 “However else clay may be described, however else we must treat it so that it becomes fertile - all this is of secondary importance; the primary thing we need to know is that clay promotes the upward stream of the cosmic factor.”

In the Gardner translation:

p. 33 “Let me remark here that if we are dealing with a soil that does not carry these influences upward during the winter as it should, it is good to furnish the soil with some clay, the dosage of which I will indicate later.

Adams translation”

p. 34 “I will observe at once, if we are dealing with a soil which does not readily or of its own accord carry the influences which should be working in this winter season, then it is well to add a dose of clay to the soil. (I shall indicate the proper dose later on).

It goes on in the Gardner translation, same paragraph:

p. 33 “With clay, we prepare the soil to conduct the crystalline force upward, for the plant growth above the Earth’s surface. This force of crystallization, which is already apparent in the crystalizing snow, reaches its peak intensity in January or February and gets stronger and more intense the further down into the Earth one goes.”

In the monumental work by Paramahansa Yogananda, “God Talks With Arjuna, THE BHAGAVAD GITA, Royal Science of God-Realization, A new translation and commentary”, the question of crystallization is discussed in more detail.

pp. 882 - 882 “Pure Cosmic Nature, the Holy Ghost, or Para-Prakriti, is a being-a conscious intelligent force. As the consort, or creative aspect, of God it possesses ego-consciousness, cosmic intelligence, mind, feeling, the five cosmic elements of ether, air, fire, water, and earth; the macrocosmic five senses of knowledge (visual, auditory, olfactory, gustatory, and tactual perceptions); the five instruments of cosmic activity (macrocosmic vibratory power, grasping motion, forward motion, creative power, and eliminative power); and the five cosmic life forces that inform all matter - crystallizing, metabolizing, assimilating, circulating, and eliminating currents. . .

The five pranas are Nature’s subtle or astral forces of life. The crystallizing force keeps the earth atoms in existence. Through the assimilating current the earth receives into its soil the forms of all vegetation, animals and human beings. The circulating current keeps the life force flowing through the earth atoms. Through the metabolizing current the “tissues” of the earth become differentiated into rocks and minerals, vegetation, and animal and human bodies. With the eliminating current the earth is kept purified.”

Thus we have a clearer understanding of the crystallization period as that time when the cosmic forces work “to keep the earth atoms in existence.” The other forces also enter into this having, ultimately, a direct effect on humans, enriching their lives while, at the same time, facilitating all the other forces to work: the metabolizing, assimilating, circulating, and eliminating currents, which Steiner did not mention in the Course.

This is the core, the key to understanding the incredible significance of Horn Clay. And the enigma or conundrum of clay which hid its significance from us.

It goes on in the Adams translation, same paragraph:

p. 33 “We thereby prepare the soil to carry upward what, to begin with, is inside the Earth and make it effective for the growth of plants. I mean, the crystalline forces which we observe already when we look our over the crystallising snow. (The force of crystallisation, however, grows stronger and more intense the farther we go into the interior of the Earth). This crystalising force must therefore be carried upward at a time when it has not yet reached its culminating point - which it will only attain in January and February.”

Gardner translation:

pp. 59-60 “That is an example of how we can look into the very life of what goes on in and above the soil. Then, if you include the fact that lime has a remarkable relationship to the world of human desires, you will see how organic and alive everything becomes. In the form of calcium, a pure element, lime does not rest for a minute. It longs to be satiated, to combine with oxygen and become quicklime, even with bitumen, which is not even mineral any more. It wants to draw everything into itself. Down in the soil, it manifests a real instinctual craving. People who are sensitive to these things will notice the difference between lime and other substances - lime suck at us, pulls us out. You get the distinct impression that something of the nature of desire is always present in conjunction with anything related to lime. Lime even draws the vegetative realm into itself, because everything it desires is

there in the plants. This has to be wrested away from it again and again. And how is this done? By means of something so thoroughly noble that it no longer desires anything.

“This noble substance - self-content, and wishing for nothing more - is silica. Silica has come to rest in itself. And people are mistaken if they think silica is to be found only in the form of a solid mineral. Silica is actually present everywhere in homeopathic amounts. Silica is self-contained and undemanding. Lime is full of demands, but silica, like our sense organs which do not perceive themselves but only what is outside of them, silica no longer claims anything at all for itself. In earthly existence, silica is generalized outer perception, lime is generalized outer desire, and clay mediates between them. Clay is close to silica, but it still mediates towards lime.”

Further down the same page:

“We must learn to understand what the nitrogen is accomplishing in among the lime, the clay and the silica, in the middle of everything that lime is trying to pull downward, silica is trying to radiate upward.”

Adams translation:

p. 54 - 55 “In such ways we can look into the life and growth of all that goes on in and above the surface of the soil. Now you must also include this fact: The limestone-nature has in it a wonderful kinship to the world of human cravings. See how it all becomes organic and alive! Take the chalk or limestone when it is still in the form of its element - as calcium. Then indeed it gives no rest at all. It wants to feel and fill itself at all costs; it wants to become quicklime - that is, to unite its calcium with oxygen. Even then it is not satisfied, but craves for all sorts of things - wants to absorb all manner of metallic acids, or even bitumen which is scarcely mineral at all. It wants to draw everything to itself. Down there in the ground it unfolds a regular craving-nature.

“He who is sensitive will feel this difference, as against a certain other substance. Limestone sucks us out. We have the distinct feeling: wherever the limestone principle extends, there is something that reveals a thorough craving nature. It draws the very plant-life to itself. In effect, all that the limestone desires to have, lives in the plant-nature. Time and again, this must be wrested away from it. How so? By the most aristocratic principle - that which desires nothing for itself. There is such a principle, which wants nothing more but rests content in itself. that is the silica-nature. It has indeed come to rest in itself.

“If men believe that they can only see the silica where it has hard mineral outline, they are mistaken. In homeopathic proportions, the siliceous principle is everywhere around us; moreover it rests in itself - it makes no claims. Limestone claims everything. the silicon principle claims nothing for itself. It is like our own sense-organs. They too do not perceive themselves, but that which is out side them. the silica-nature is the universal sense within the earthly realm, the limestone-nature is the universal craving; and the clay mediates between the two. Clay stands rather nearer to the siliceous nature, but it still mediates towards the limestone.

Let me summerize. Clay mediates between silica and lime, promotes the upward the upward stream of the cosmic factor and is the carrier of the cosmic upward stream depending on the translation.

In earthly existence, silica is generalized outer perception, lime is generalized outer desire, and clay mediates between them.

WHY MAKE Horn Clay?

Why make Horn Clay? Because it will facilitate the movement of cosmic forces between silica and calcium, enlivening the natural clay finally bringing out the threefold nature of silica-clay-calcium, also finally bringing the three into balance.

Horn Clay is very important to the success of the application of the preparations. Without the Horn Clay, it is simply not possible for the Steiner Agricultural system of preparations to reach its fullest potential. The misuse or lack of use of Horn Clay over the years since the original lectures has had a very limiting effect on the progress of biodynamics. Not so with **Wholistic™ Agriculture**. Clay works to connect the concepts in the human mind just as it works to connect the effects of silica and clay. Those who do not use it do not benefit from the complete understanding of the what the Universe has to offer. So the lack of use of clay, or Horn Clay, has a limiting effect on the benefits and the understanding of the basic system.

Clay plays the part of the mediator, in a sense, like water. It acts to connect the various disparate elements of Nature into a coherent whole. Without the action and activity of clay to hold it together, it is not possible for the various elements to carry out their respective duties.

How does this come about? Let us look at clay more closely. You will notice that it has a very strong positive and negative bonding properties. These properties are representative of the nature of clay. It holds together or bonds the various elements so that they can work together. It is, in a very real sense, the glue that binds the soil together. Without this glue, it is not possible for soil to gain the kind of structure, both physical and etheric, necessary for a plant to properly exist. This structure, emblematic of the structure of the Universe, is what holds soils together. So we see that the nature of clay is that it binds and connects, both at once. These physical realities or observations work exactly in the same manner in the astral and etheric worlds. All work together.

Why is it important to make Horn Clay? This too is very much like the other remedies. It is important to at once conserve and utilize the homeopathic properties of the clay. Bentonite clay is more than adequate to do the job. Other local clays work very well too.

The Horn Clay works homeopathically as do the others. By placing the clay in the soil as you would horn silica, you are greatly increasing its power to radiate its spiritual properties over large areas. So it is at once more efficient and more beneficial for all the same reasons the silica and cow manure are placed in the horn first.

The presence of Horn Clay in a field will bring together or bind the various disparate elements that you are applying. This is the genius of God. By further preparing the Horn Clay as you would the BD 500 and BD 501, you are creating a sympathetic presence in the field as well.

THE THREEFOLD NATURE OF CALCIUM, CLAY AND SILICA

Let us look at the three elements and compounds not from the threefold point of view, but from a twofold point of view.

When we have only calcium and silica and rely on the presence in the field of clay, we have no real activity in mediating the two. The twofold nature relates specifically to the polarity between the two. We have heard Steiner's Agriculture teachers talk endlessly about the polarity (which is in reality the twofold nature) of both calcium and silica. Calcium low and fat, silica tall and thin. Calcium desiring everything, silica above it all. But how do you get the two to relate and work together. After all, the Universe is built on harmony and balance. How can two forces which are such polar opposites be in balance? It is, in reality, not possible. And for all these years, the BD teachers danced around this problem, not understanding nor solving it.

Polarity in a field releases the polar opposite forces in the field. So we see an explosion of growth and an explosion of energy - both. While this is exciting, it is not healthy for the field, for the plants and animals and most importantly from a human's point of view, not healthy for the food.

So, we say, farmers have been using this for 75 years and they get better crops with only 500 and 501 than they do with other methods. This is true. But let us examine why and what a difference Horn Clay can make.

They get, through the application of horn manure and horn silica a release of these forces in the field. Consider

that modern agriculture ties up and binds up these formative and regenerative forces, to say nothing of the spiritual forces it ties up (Mana, Prana, Life Force Energy, Chi, etc.) so completely that anything that would be released in the field would show an improvement.

Further, conventional farming techniques do not take into account the Devas and Nature Spirits and their essential work. Further still, conventional agriculture does not take into account the other 7 Realms and Dominions that exist simultaneously with the earth plane. These are vital considerations.

When one applies the carefully prepared 500 and 501, it releases these formative and regenerative forces in a field so one is bound to see improvement. But not the kind that is possible with the inclusion of Horn Clay.

Now, with Horn Clay, we have the establishment of the THREEFOLD nature of calcium - silica - clay. Like a three legged stool, this brings stability to the field and, at the same time, brings the archetype to the field. This does not happen when one only uses 500 and 501.

It is interesting to note that even if one uses 500, 501 and Horn Clay but refuses or neglects to use the other preps, one is still really behind the eight ball. A field will never reach its fullest potential and archetypal form without using ALL the preps the way we have given.

Now, a mention about the essential use of Horn Clay and the new millennium. The new century will be characterized by a definite increase in the complexity and nature of the matrix surrounding the Earth. This is essential for the growth of the Earth soul and for all souls who want to come here to learn the lessons of the Earth existence. This matrix is characterized by balance and harmony and anything that is outside of that form will not survive here during this period of peace and harmony. That is why it is essential to use Horn Clay because it completes the balancing process and harmony by mediating between calcium and silica.

Also, it is essential the clay be prepared in a horn exactly like manure and silica. This brings the clay to the same state of astral - etheric balance necessary to do its job. The amount of clay in a field has NO RELATIONSHIP to the use or desirability or effectiveness of Horn Clay. Horn Clay should be used regardless of the clay content. There is no relationship between the two.

Now, the question arises, will the Horn Clay increase the amount of clay in the soil or decrease it? No. Not in the sense that some seem to see. What Horn Clay does, again, is create an archetype in the field that allows the soil to grow into, not the other way around. This process can take some great amount of time, or it can happen quickly, depending on the history of the area and the thinking of the farmer. The addition of BD compost has a definite effect on this balance as well. Both will bring the field into its archetypal form of a perfect balance between silt - clay - sand and humus.

Clay also brings out the life force energy into 500 and 501 and this adds to the balance but its role is to bring the two together which creates the balance, not make the balance itself. This is a crucial and essential distinction between the two concepts.

COSMIC RELATIONSHIPS OF CLAY

Horn Clay is related DIRECTLY to Pluto which, then, in turn is related to the heliopause which he (Pluto) maintains. THAT is the fact of the matter.

(According to Hugh Lovel, the other Steiner preparation's planetary relationships are as follows: 500 - Earth, 501 - the widest expanses of universe, 502 - Venus, 503 - Mercury, 504 - Sun, 505 - Moon, 506 - Jupiter, 507 - Mars, 508 - Saturn.)

Now let us consider this matter more closely. Pluto, as you remember is responsible in this solar system for filtering all of the energy, thoughts words and deeds coming from the souls in this solar system. That means ALL souls, those seen in the physical plane and those not seen. It works both ways. Both filtering in and filtering out. So, we can look at the heliopause as the "membrane" which does this filtering. This "membrane" is created and maintained by Pluto for the benefit of everyone in this solar system and everyone outside of this solar system.

Without this filtering membrane, it is not possible for other cosmic systems to operate without undue interference from outside sources.

Every cosmic system is inhabited by souls throughout the Universe and throughout the Ultimate Universe. The number of souls in existence cannot be counted because the number is constantly changing. But it is a lot. Numbering in the Earthly sense does not count that high.

So it is important for us to consider what Horn Clay does on a local level and how that has an impact on a field. Also, how it relates to the planet soul Pluto and how this information can be used to enhance the activity of Horn Clay.

Horn Clay operates in several realms at one time. As you have determined, it facilitates the movement of the Cosmic forces down into the Earth in the silicacious rock, then up through the Earth into the calcium forces held within the calcium compounds in the upper layers of the Earth. This movement then continues through the plants.

Of particular concern is the movement through living organisms which are particularly sensitive to the Cosmic forces. These forces can enhance their life force energy directly even as though they were doing the pranic breathing exercises. This is particularly noteworthy as the movement increases a soul's awareness of its Divine Nature. Of its Self awareness. This leads to wisdom and unconditional love, eventually.

So it is the movement of the Cosmic Forces upon which we direct our attention at this moment. This natural flow of the THOUGHT and EMOTION, the WISDOM and INTELLIGENCE of the Creator is what brings souls to this awareness and it cannot come to them if this stream is interrupted.

In 1924, Dr. Steiner observed that the food grown at that time lacked the spiritual energy necessary to activate the WILL is such a way as to make it possible for the thoughts to be manifested in the material plane, and consequently, in the other planes and domains at the same time. When the WILL is weakened through the lack of movement of the pranic, or life force energy, the soul becomes as driftwood on the sea. It is blown in any direction the winds take it with no control over its own destiny, no activation of free will, no sense of Self. The ego then takes over as it is directly connected to the Earthly physical plane. This self, or the "I" (some call it the "I am") has only attachments to the physical world and as such, seeks happiness and satisfaction through purely material means. Moreover, it is not connected directly to the Creator as is the Self, as it is interrupted in this matter by the veil of delusion, or Maya. Having this orientation, it then also does not see any need to recognize the existence of the Creator. For this recognition is not only not possible in this state of mind, it is not desirable in the "mind" of the ego.

So this soul, deluded into thinking that it is the ego, finds pleasure and happiness through material things or physical activities, never really connecting to the Creator of All That Is. It is, as Dr. Steiner said, under the influence of "Ahriman" and "Lucifer" which are representative of ignorance and detachment.

The activity of Horn Clay, which facilitates the free movement of the Cosmic Forces through the Universe, and through the body, mind and soul, then restores the energy necessary for the free operation of Free Will. That is the essence of the nature of Horn Clay.

Now, how does this relate to Pluto and to the "membrane" called the heliopause, in physical science terms?

Pluto is the planet soul responsible for maintaining this "membrane". So, we can say that Horn Clay relates directly to Pluto, not the heliopause, to which it relates indirectly. It is the job of the planet soul Pluto to maintain this membrane so that is what it relates to directly.

Now how is this information useful? We have seen that there is considerable misunderstanding of the relationship between plants, animals and humans to the constellations in the sky. No one, it seems, gets it right. And in a sense, no one gets it wrong either since the soul has the ability to create its own reality. (What you think, you grow.) So let us look at the relationship between Pluto and the rest of the physical planet bodies in this solar system.

There are nine planets, an asteroid belt (which was a planet), a sun and many moons. Each has a particular role to play in this solar system, as you know. We have discussed several of the planets and you have spoken directly with them also. Each planet has a role chosen by God for one purpose only. That purpose is to provide an environment where all souls desiring God-Consciousness can come to learn the lessons necessary for their individual advancement. Each planet has a role to play so that in consideration of the whole fabric of this solar system, there is completeness, nothing left out.

The planet Pluto functions in the role of filtering all that comes in and goes out of this solar system. Without his activity, there would be great disruptions in the Universe. So it is important for the farmer or gardener using Horn Clay to understand these basic premises. Horn Clay is related directly to the planet Pluto. When Horn Clay is applied at a time when Pluto is opposite the moon, that is to say, when the moon is on one side of the Earth and Pluto is directly opposite it on the other side of the Earth, we can say that the water or life force energies carried by water are interrupted or influenced by the Earthly realm. This has the impact on the field of changing the relationship of water to plants and soils such that it does not carry as much strength to the plants as it would if the moon were located directly between the Earth and Pluto.

In another vein, if Pluto is located directly behind the Sun, in line with the Earth, the solar influences of the Extreme Life Force Energy would have a significant effect on the flow of this life force energy through soils and plants. If the Sun is located on the other side of the Earth, opposite Pluto, these then again, are interrupted.

What this means is that there are times when Horn Clay should be made to enhance the flow of life force energy and times when it should be made to lessen the flow. This can be useful in areas that are overgrown or areas that are desert. Burying a cow horn with clay in it during the periods of time that either the Sun or the Moon are between Earth and Pluto are particularly good times to do this.

One may also say that when Pluto is behind the Sun or the Moon, these are particularly good times to apply it.

Having said all this, it would be beneficial to state that these are not hard and fast rules. Again, “catching the wave”. What is more important is the thought that goes into the clay as it is made. This can overcome all “weaknesses” of making or using it at the wrong time.

The planetary or constellation influences exist. That is a fact. But they have a lesser influence than the moon, so let us look at the relationship between Horn Clay and the Moon around Earth.

CLAY RELATIONSHIP WITH THE MOON AND EARTH

What is the relationship between Horn Clay and the Moon around Earth? The Moon functions as both a reflector and a processor of Life Force Energy. In this role, it provides for the Earth and Earthly souls a place that is fecund and fertile for both their minds and their bodies. This too is part of the role of clay and Horn Clay. Let us distinguish between Horn Clay and clay here so that this discussion does not get confused.

Clay, in its natural state, can function and does function as the conveyer, facilitator and mediator of the Life Force Energies, or Prana, of the Universe. It does so in its natural state as a matter of course. But clay too is subject to the whims of mankind, the ultimate creator on the Earth. As mankind thinks, so does he act and acting in such a way as to create disharmonies and imbalances on the Earth makes it difficult, if not impossible for clay to function in its original role, just like calcium and silica. Upon failing to function in this primary and sole role, clay then becomes, in a sense, imprisoned in the minds of humanity, unable to break out to do its job, to fulfill its role. Horn Clay, activates the clay and bypasses these imbalances and disharmonies in the same way that silica and calcium (horn silica and horn manure) do in their roles. So it is important, at this time in the existence of the Earth that these remedies become available and used.

In my opinion, the reason that Horn Clay was not revealed to the world in 1924, or since, is the simple fact that the Earth was not ready to receive what Horn Clay had to offer. It does now and that is why Horn Clay has been brought into the world now.

And we would add, it is my belief that if Horn Clay is not used at this time in a Steiner program, that program will become less and less effective, reducing it to the level of effectiveness of organic practices which, while well intentioned, do little to imbue plants with the spiritual energy necessary for humankind at this important juncture in its history.

So. We continue as before.

Let us again focus on Horn Clay but we will discuss the role of clay in general. As the Moon reflects and processes the light of the planets and suns around the Universe, it adds to it its own role which then is reflected on all parts of the Earth. The Moon, as you know, is related directly to the watery element. Not like Neptune. But in this case, the movement of life force energy throughout the planet Earth. This reflected light carries with it all the processed light and prana of all the planets and suns and moons in the Universe. It is a combination. Let us look at water. It too carries with it, in oxygen, the life force of the Universe and in hydrogen, the connection to the One, the Divine, the Creator of All.

So clay attracts to it water. Water is the sustainer of all physical or material life. Why is this important? It is water that is attracted to the clay. Not vice versa. Clay is not attracted to the water. Do silica compounds attract water? No. Silica sits nobly on its throne of at once indifference and all knowing knowledge. Calcium, on the other hand, has an insatiable desire to combine with everything, and in the process, learn from everything. So clay plays the role of bringing the water element, the Life Force Element to calcium which, in turn, brings the Pranic energy directly to all life forms in the material or physical plane.

Let us review. Clay acts as a mediator between silica and calcium. It acts to bring the Life Force Energy in water from silica (which has none) to calcium (which has an endless appetite for water) to all living things. Clay also relates to Pluto which maintains the shell or membrane around this solar system, protecting those souls and planets within the membrane from the negative forces outside of the solar system and protecting the Universe from the grosser vibrations of the souls in this solar system. There is more, though.

Clay relates directly to the Moon in that both are living in the watery elements of the Universe. That is to say, both process and convey the Life Force Energy through the action of water in the physical world or material plane. Clay relates to the Sun in that it also carries the Life Force Energy that is the purview of the Sun to provide to the planets and souls in this Solar System.

So where does this take us. Outside of this solar system, actually. As we relate to the outer worlds of this Galaxy, we see in its form a swirl or circular pattern of movement in the cosmos. Water, as does all ether and all liquid, move in this manner which reflects the movement of ether and life force energy in the Ultimate Universe. As water flows, so does ether and Life Force Energy. This then leads us to conclude that the movement of water, in clay, on a microscopic level, also has whirlpools and eddies, vortices and concavities. All life moves in this way. It cannot be any other way.

So we, then, see that clay is a carrier of this archetypal form of movement in the universe and therefore has a direct influence on the formation of all physical manifestations of Spirit. This is important to understand. Clay has a direct impact on the formation of all physical matter. It guides its form and formation. So we see another role for clay and Horn Clay. It brings matter into its most desirable form. So when the role of Horn Clay is interrupted or thwarted, we see misshapen forms developing. When clay is functioning as it should, we see forms taking shape as they really should, more closely expressing both their archetypal form and the Unlimited Creative Expression of Spirit. This then offers new hope to the world.

The expression is that a man has “feet of clay”. This does not mean that he literally has clay feet. Nor does it mean that this man is fragile and incomplete as a human being. It means that the clay, as represented analogously in the statement, represents the movement of the archetypal form from Spirit to the form, whether it is elemental, mineral, plant, animal or humankind.

When the movement of the Life Force Energy proceeds from the Universe, out of the Whole, into the Earth, it proceeds from finer form to grosser form then to return to finer form again. The creative ether, the stuff of the universe, that out of which all matter is made as a reflection of the Thought of God, always moves in a circular pattern. It never moves in a linear pattern going only in one direction. It does, of necessity, move “out” then “in”. Ashes to ashes, dust to dust. What comes from God returns to God. There is no other way.

We see this movement as coming from the Cosmos, in all its myriad forms, into the Earthly realm, the Earth, and finding its way into the silicacious material deep within the Earth where it is stored, as in a battery, and processed by the Earth Soul to make it compatible and harmonious with the Earthly matter. It then moves up and out of the Earth into the calcium elements, by means of clay, where it is again taken up by all living things (including minerals which are just as “alive” as plants, animals and humans but lacking in self-awareness, the “I” or ego) and out into

the Cosmos.

During this passage, which continues constantly, it never stops unless God wills it to stop, it passes through all living things. Let us focus on humankind for the moment. When the human soul becomes disconnected to its Center, its Self, its Christ Consciousness and its Relationship with God, it is due, in part, to a lack of Life Force Energy, or Spiritual Energy (Prana, Chi, etc.) in itself. The yogic breathing exercises convey this Prana directly to the soul and, in many ways, can bypass the movement of the Cosmic Forces through the Earth and himself. But it is still not enough for most souls, avatars being the sole exception. Avatars are no longer connected to the earthly plane the way non-liberated souls are, thus are not dependent on Earth for their existence. The rest of us are. So again, we must look to clay to perform its duty of providing a framework, a relationship, a facility, a mediation, and so on, for the movement of this Life Force Energy in a completely fluid manner, uninhibited by the thoughts of mankind which work against it disharmoniously and through imbalances.

Ultimately, clay, and Horn Clay, play the role of providing the soul with the wisdom, spiritual strength, knowledge and understanding necessary to bring him or her to a state of Unconditional Love and release him, or her, from the bonds and ties of the material plane. This is the ultimate role of clay, and Horn Clay as the remedial or prescriptive medicine necessary to reestablish this connection.

Horn Clay is the most important of all the Steiner preparations. It is the pivotal center upon which all the preps operate. And, at the same time, it is the one remedy that makes it possible for the Life Force Energy to pass uninhibitedly through the material plane and through all living things, including human souls. This also applies to the Elementals as well as all other souls, angels, archangels and such that inhabit this corner of the Universe. Ultimately, what happens here effects all the Universe. Therefore, we can also say that the Universe is directly and indirectly effected by Horn Clay, even more so than the other Steiner remedies. Horn Clay is the single most important of all the Steiner remedies and will guide the future of farming for the next 300 years and beyond. It is the key to successful farming in the new era coming.

WHY CLAY?

Why clay? What is it about clay that makes it capable of performing these roles in the Cosmos?

Excellent question. Clay has a plasticity to it, an amorphism that allows the Creator to change it literally into any shape or size. This flexibility is expressed in God and manifested in form, clay. Just as the Creator of All relates to all there is, so does clay relate to all physical matter that is. So it is that God created clay to perform these duties. It is not the other way around. Clay was not there so God decided to use it. Clay directly expresses the Desire of God to provide a medial point, a mediator, a facilitator and so on, to move His Life Force throughout physical creation.

You will note that clay is made up of various elements. These include aluminum, magnesium, silica, oxygen, hydrogen, sodium, potassium, calcium and others to name a few. Clays contain a great deal of metals which, we have discussed, convey various kinds of pranic energy to plants and other beings. Clays often contain silica and calcium, two elements crucial to this discussion. Magnesium carries with the wisdom of the Universe. Aluminum contains the thought forms of many plants and other beings as well as the growth regulators of the Universe. We can go through all of them another time but you understand the point. We have a mixture of what is needed to convey the Life Force Energy in a way both proper and effective. So in order to accomplish this, it is necessary to combine various elements (roles) into a substance that will better accomplish this feat.

Now let us look at the structure of clay. It is unique, again, in that it is made up of plates or platelets which lay one on top of another in a linear fashion. This linear movement, again unique in the Universe, guides both physically and etherically the movement of the Life Giving Forces. It both symbolically guides these Forces and, in fact, physical guides them although it may not appear to do so at first inspection. But it is so.

The fact that clay is plastic in nature, capable of assuming literally any shape, lends itself to the flexibility required to process the many different kinds of etheric current and energies. Again we state, clay did not exist

first. The Desire for clay existed in the mind of God, then was manifested into form to perform its duties and role. Notice also that the ability to form itself into any shape also is a reflection of clay's ability to carry the archetypal form into form on the physical plane. That is to say, it is theoretically possible for any shape to be made by clay, reflecting the Infinite Shapes of the Creator. Again, clay is a reflection of the Thought of the Divine. That is why it exists. It was not chosen. It was created.

WHAT KIND OF CLAY SHOULD BE USED?

The obvious next question is what kind of clay would make good Horn Clay?

What is clay? We can define it physically. The scientific definition is "a detrital mineral particle of any composition having a diameter of less than 1/256 mm (4 microns). This is approximately the upper limit of size of particle that can show colloidal properties."

Detrital means "pertaining to or formed from detritus, especially said of minerals occurring in sedimentary rocks, which were derived from preexisting rocks either within or outside the basin of deposition."

Colloidal means "a particle-size range of less than 0.00024 mm, i.e. smaller than clay size. Any extremely fine-grained material in suspension, or that can be easily suspended, commonly having peculiar properties because of its very high surface area. A common colloid in nature is clay, which has such properties as plasticity, thixotropy, and swelling."

This science is all very well and good and even interesting but it doesn't necessarily get us closer to understanding clay. So we must go to a more generalized approach which is the nature of Steiner's Agricultural ideas and insights.

There are three groups of clay recognized by geology. They are:

Kaolins, smectites or montmorillonite and illites.

The minerals are generally derived from alteration of alkali feldspars and micas, both very close to silica. Feldspar, in fact, was recommended by Steiner as a possible substitute for quartz for making 501.

The smectite minerals are common in soils, sedimentary rocks and some mineral deposits. Montmorillonite, formally used as a group name in the above sense, is now considered a mineral of the smectite group. Smectite clays are the chief constituents of bentonite and fuller's earth.

Illite clays a general name for a group of mica-like clay minerals that are widely distributed in argillaceous sediments, esp. in marine shales.

Of the three, bentonite is the most interesting because it sits squarely in the middle of all the clays. It is neither too close to silica nor close to calcium which may be present in greater amounts in Illite clays.

Bentonite clay is a soft plastic light-colored clay formed by chemical alteration of volcanic ash which comes directly from the Earth and carries with it unadulterated astral and etheric forces from within the Earth. In this sense, it is the "cleanliest" of all the other clays which either come from silicaceous rock or sea bottom deposits of silica, clay and soil. The "clean" astral and etheric forces are ready to be influenced by the Cosmos and our intention in ways not possible for other clays. So here we have the "plain vanilla" of all clay possibilities.

There are two kinds of bentonite clay available. One is better than the other. They are sodium bentonite which will absorb large quantities of water, increasing in volume as much as 8 times. The other is calcium bentonite which swells little more than ordinary clays. We want to use sodium bentonite which is also known as Wyoming bentonite. It can be purchased in power form in 50# bags from most chemical suppliers or construction supply houses. The powdered form is the most convenient to use.

A list of definitions is provided at the end of this report.

The next question often asked is whether or not it is advisable to use local clays? It is as long as they come

from the Smectite or Montmorillonite groups. Local clays can have a powerful effect on your land and plants. And, they can work in different ways than bentonite. The best advice is to experiment on small areas first. Definitely do not use clays from the Kaolin or Illite groups. These will be much less effective.

HOW TO MAKE Horn Clay

We make four kinds of Horn Clay: Spring to Spring, Fall to Fall, Spring to Fall and Fall to Spring.

We use bentonite clay because it is available and already ground to a powder. It is an excellent neutral clay. We pack it in the horns in exactly the same manner as horn silica.

First, select your horns which should, as you know, be from a female cow. Place the bentonite clay in a good sized container with sides roughly half as high as the bottom is wide. Add an equal amount of water and stir either by hand or with a stick or trowel until the water is thoroughly mixed with the clay and let it sit overnight. The next day, the clay should be swollen and somewhat plastic but stiff. Add some of additional water a little at a time and stir until the clay works easily with your hand. Do not put so much water in it that it becomes liquidy. Remember, bentonite will swell to 8 times its volume. If you put too much water in it, it will dry in the cow horn to 1/8th its volume which is not much good.

Always wear a good quality dust mask when you are working with clay dust. Breathing in the particles can cause silicosis which can kill you.

Select a horn and, using a stick, spoon or a flat piece of metal (I like an old aluminum splint), take a small amount of the wet clay and stuff it into the horn. Get some more and stuff it again. As you do this, hit the side or pointed end of the horn on something hard, wood that you don't mind getting dented is preferable, and tap the horn so that the clay inside slides down into the bottom of the horn. Repeat again until the horn is filled. Set it aside so that the hole is up and move on to the next one.

If you are filling a lot of horns and want to continue the next day, place a wet towel over the horns so they will not dry out. Horns with dried out clay will discharge their contents when you try to bury them in the ground.

Preparing the pit. Lay your horns out in a bunch so that you know how much space they will take in the hole. Select a place on your property where there will be no traffic. The intersection of two ley lines would be nice also.

Dig the hole at least two feet deep and three times the width of the horn pile. Place a minimum of 5 inches of decomposed Steiner compost in the bottom of the hole. Place the horns side-by-side, hole down, point up (more or less), in the center of the pit and cover sides and top with more Steiner compost until the hole is filled. Cover the compost with the dirt you removed from the hole so that it is mounded up. Surrounding the horns with Steiner compost greatly increases the potency of your clay and other horn pit preparations.

As you may be using the same pit for horn silica, horn basalt or horn sulfur, it is best to make a map of what you buried, where and when so that when you dig them up six months later, you know which is which. Remember, some of your clay horns will be left in the ground for six months, some for 12 months. It's easy to get confused a year later.

Removing the clay horns from the ground is simply a matter of digging them up - carefully. When taking them out of the ground, be sure not to let the clay fall out of the horns. Hold it in with one hand as you remove it with the other. Take the horns to a water faucet and wash off the dirt and fungus on the horn. Place the horns in a sunny, dry place (I use a coldframe style miniature greenhouse I built for this purpose). Let them dry in the sun. You can leave them there over night. If you like, you can dry them inside but outside in the sun is better.

When dry, tap or shake out the clay. Most of it will be hard and dry but some will still be soft. Let that dry completely before moving on to the next step. If you have more than one type of clay drying, be sure to separate them and not mix them. There will be noticeable consequences in your fields later if you do.

When all the clay from one batch is dry, gather up the pieces and grind them up in a mortar and pestle. You want to grind them to the point that they are in a coarse powder form. As you grind them, use a fine sieve to

separate out the finer particles, then grind down what is left. Repeat until all the clay is again in powder form.

You will notice that the clay is not as fine as it was when it originally came out of the bag. That doesn't matter. Once in water, the clay will dissolve completely.

Don't mix one year's batch with another year. Keep them separate.

APPLICATION OF Horn Clay

We spray a Spring to Fall Horn Clay that is applied in the Spring; a Fall to Spring clay that is applied in the Fall; a Spring to Spring clay (one year in the ground) for new Spring applications; and a Fall to Fall Horn Clay for new Fall applications. These latter two would be for new fields and fields in a state of severe neglect. Thereafter use the six month clay started at the same time as the spray application. The year is divided into Spring and Fall by the summer and winter solstices.

Mix a rounded 1/2 teaspoon (3/4 teaspoon) per acre in rain water or solarized water and stir for 60 minutes with 500 and 501, then apply to the ground in the same manner as you would horn manure. Always apply Horn Clay after you have applied horn manure and horn silica. Spray it in the late afternoon on the ground.

The best sequence is as follows: Apply 500 horn manure in the afternoon; apply 501 horn silica the next morning; apply Horn Clay that afternoon. The closer you can spray them in a sequence, the more benefit you will get.

For soils deficient in clay, we use a rounded full teaspoon per acre. You will find that a double application will be far more effective than one double strength application.

Horn Clay will stay active for a minimum of 3 hours and has a residual effect of about six months, so it is well to apply it twice a year.

The difference between the Horn Clay and 500 and 501 is that it should be placed in the ground for the entire year. It must experience all the facets of the sun, the moon and the Earth as she rotates and revolves around the sun.

The Horn Clay works to mediate not just between the silica and the limestone, it mediates between the physical, astral and the etheric. In many ways it is similar to oak bark (BD #505). Though oak bark is rich in calcium, it is also rich in the astral energy necessary to bring the plant into bodily form. It works the same way with the soil. It brings it and all that live within into bodily form too. Even the worms, insects, and bacteria among all the others. Everything is effected by the strong astral energies of the oak bark. Thus it can also be used to enhance the areas that have been devastated by methyl bromide and other life killers in the soil. It can be mixed with 500 for this purpose.

Horn Clay is best applied in the Spring time. That does not mean that it cannot be applied at other times of the year. Ideally, at the full moon days - three before and three after.

It is not necessary to worry about whether or not it will rain with regard to the Horn Clay. Apply it. There is no problem unless it is raining at the time in a steady rain. Unlike the other Steiner preparations, clay actually enjoys a little rain at the time it is applied. It works to bring together all the astral and etheric qualities in the plants, the soil and the air and water. It actually thrives on water. Notice how "bloated" clay gets in water. It loves it.

Between the Horn Clay and the #800 Stinging Nettle - Basalt Tea (another topic), we have two of the most important mechanisms developed to bring the kind of harmony and balance and healing to fields that we need to do.

DISCUSSION

Why apply Horn Clay after 500 and 501?

The connection is made after the application, If applied before, it has nothing to relate to and its power dissipates.

Silica is “loaded” and calcium is “waiting”. It’s like turning on the key in a car. It’s all ready to go. Just turn the key and off you go.

Always take advantage of the nature of Horn Clay this way. Never reverse the sequence unless you want to draw to the field an inordinate amount of water which will push the field out of balance. 500, 501 and HC will maintain this balance.

During the crystallization period, my understanding is that the Earth goes “within itself” to renew itself. Does this happen all the time in a field after Horn Clay has been applied? It is my observation that this does occur but for only a few days or up to two weeks then it reenergizes itself and grows into its proper form.

Let us begin at the beginning. Yes, during the crystallization period, the Earth does indeed go “within itself” to remake its form. That is what Master meant when he said the crystallizing element causes the atoms to renew themselves. What happens during this time is that the renewal process relies heavily on the pure thoughts of mankind and the Cosmic Spirit to recreate itself. By applying Horn Clay, these thoughts are more “pure” than if the Horn Clay had not been applied. Thus, the field, in this case the vineyard, is able to more accurately express itself in the archetypal form of the vine.

So the answer is “yes”, the crystallization process takes place as soon as the Horn Clay is applied and when the Earth itself goes into this period in the various locations around itself, it too is renewed.

Hugh Lovel writes: “This will really wake up the clay in the soil making it a means of transport for silica forces moving upward into plants. Winter (Fall to Spring) Horn Clay is made by packing cow horns with clay and burying them from fall to spring. This stimulates clay’s role in absorbing the crystallizing forces, carrying these crystallizing forces upward from deep down during the winter. This has an especially strong effect on plant growth.” Does Horn Clay “wake up the clay in the soil”?

The answer to this question is yes and no. It doesn’t “wake up the clay” so much as it vitalizes it and helps it recall its memory of its role in the world. As clay, and other mineral compounds, which are the simplest of all life forms, get beaten down over the centuries by the direct and indirect abuse of humankind, they forget or begin to forget their role in the cosmic play. When this happens, they become slow or “stupefied”. That is they, the clay minerals, no longer carry out their role with the verve and vigor associated with clay in more pristine times. So the acts of humankind, both physical and mental, serve to cause the clay to lessen its ability to carry these cosmic forces from the silica deposits to the lime (or calcium) deposits. The introduction of Horn Clay into a field helps these forces to “wake up” but more directly and more accurately, it causes the clay to regain its memory of its proper role in the cosmos. That is the essential purpose of Horn Clay.

As to the question of whether or not Horn Clay “stimulates clay’s role in absorbing the crystallizing forces, carrying these crystallizing forces upward from deep down during the winter”, what say you?

This is true but only in relation to the aforementioned argument. The purpose of Horn Clay as it relates directly to clay is to cause the clay to recall its role in the cosmic drama. That and only that. Any other description is inaccurate.

And does this have “an especially strong effect on plant growth”?

Yes. It does. But more importantly, and we have neglected this aspect too much, it serves to restore the spiritual balance and energy in the plant so that it can reach its potential or archetypal form. Remember, we are dealing with the SPIRITUAL renewal of agriculture. This means by inference and direction that we are attempting to restore the spiritual properties in plants so that they can be passed on and absorbed by those who eat them, regardless of the species. It is just as important for a cow, or an insect, to eat of these spiritually nutritious plants as it is for humans to eat of that plant. Equally important. That cannot be stressed too highly or too often. All life is spiritual. The spiritual essence permeates all life regardless of the form it takes. All life. To deny part of this life the opportunity and the right to take in these spiritual properties hurts all life. Just one bit of a leaf of spiritually enriched lettuce leaf eaten by a bug is helpful to all mankind. All is interconnected to the One. Any damage there brings damage here. Any improvement there brings improvement here. That is the lesson for today.

Why does the addition of Horn Clay equal individuality?

With Horn Clay, as we have indicated, we have the completion of the threefold process in lime or calcium, clay and silica. When this is activated, we find that the area which is treated will and does act differently from the surrounding areas. It is, in addition, much more subject to the thinking of the grower or farmer. So we have an area of land that is greatly sensitized to not only the cosmic forces but the creative thinking of the farmer. This process of visualization by the farmer is what begins the process of individuality in the field. What you think, you grow.

In this instance, the individuality of which you speak is the concept visualized by the farmer about the field. In order to create the barriers in the field that one desires, it is necessary to have a clear idea what you want to do.

In the case of the Merlot at Topolos, we have a field which was the subject of brutal and constant attacks by pollution and the thoughts - incoherent, good, evil and otherwise, from the road. You set out to isolate that field from this pollution and so it is. By establishing barriers and boundaries around the field, clearly delineating the boundaries and concentrating your energies on the field itself, you created the "force field" that is the barrier around the field, thus you created the individuality in the field.

The role of Horn Clay in this process is to provide the means by which the cosmic energy is released into the field, making it much more "susceptible" to your thinking and intentions. What holds the field in this individuality is your continued intentions, facilitated by the field sprays and the organized process we call Wholistic™ viticulture.

That is the answer. It is not the Horn Clay as such that creates this individuality but it is the Horn Clay that facilitates this process and brings it about. It would be the same if you left out any of the other preps. Leave one out and then one could say that that one is the one that is most essential. But that is not true. They are all essential. Each has its role and together, it creates the environment in which the individuality can happen the way you envision it.

If horn manure supports soil/plant fertility and horn silica supports soil/plant nutrition, what does Horn Clay support?

Horn Clay supports the movement of the life force energies from the Earth to the plant by going through silica, calcium and itself. It does not support either nutrition nor fertility as such but supports the movement of the Life Force Energy through these substances so that the individual parts of that which sustains life on the Earth can do what they are supposed to do. It at once neither supports fertility and nutrition and it does support fertility and nutrition.

Moreover, clay has, as we have said, a mediating effect between calcium and silica. This mediating effect also serves to support the relationship between calcium and silica. This relationship, from one that wants nothing to one that wants everything, is a difficult one to manage. Think of what life would be like if there was no mediating effect between the two. Both would be constantly at odds to rule supreme. Yet neither can do that because to do so would destroy all life as we know it. So it is essential that one such as clay assume the role of mediator, or reconciler, between the polar extremes of want and not want. Clay is unique in this respect.

As an aside, you are absolutely correct in your discussion of smectite clay being the one closest to the middle between the two extremes of silica and calcium. The other clays are indeed too close to silica or calcium.

So, we can say that Horn Clay neither supports nutrition nor fertility but, at the same time supports both. That is your answer.

In some translations of the lecture, clay is called a carrier. In others it is called a mediator or promoter. Which one is correct?

It is all as well as a facilitator and a regulator. It regulates the flow of energy from deep within the earth back to the outer cosmos.

What does that mean?

It is only focused on the movement of the cosmic forces from the planets down to the silica and out through lime to the cosmos again. It is far more complicated than that but insofar as this diagram reduces itself to these

specific forces, it is correct.

Another topic for another day. Now for the best question. What are the alternative uses for Horn Clay?

There are none. It is not like the compost preps nor like any other. It is a mediator and facilitator, a carrier and a progenitor. It works with that which is in existence. If you applied Horn Clay as an individual spray, it would accomplish nothing since there is nothing for it to work with. That is the key here. So, in a practical sense, there are no alternative uses for Horn Clay like there are for the others.

Now, having said that, we can say that Horn Clay should be incorporated into every aspect of Steiner's Agriculture. This would include barrel compost and Steiner compost if one is of a mind to add horn manure and horn silica to the pile. This is not the recommended way to make Steiner compost but it is illustrative of the necessity and importance of Horn Clay. ANY TIME you use 500 and 501, you should use Horn Clay to complete the process.

If you make barrel compost, make it with Horn Clay. If you spray the fields, spray Horn Clay too.

What is the proper point in the sequence to spray Horn Clay?

It should always follow 500 and 501. Never insert it between the two. It will work but not as well. As you apply horn manure and horn silica, the two are grasping for a relationship between themselves and are searching like the tentacles of a Hydra for something to grasp. They are, in fact searching for each other and by applying clay after the application of 500 and 501, you succeed in bringing the two what they want most - each other. So they embrace the Horn Clay as they would not do had you chosen to apply it at any other step in the sequence.

Remember, always apply it to the ground. Applying it to the upper part of the plant will cause problems including the growth of fungus since clay attracts water. Keep it on the ground where it is most at home.

So, you apply 500 and 501 and this creates a demand for clay?

That would be accurate. They embrace the clay in the Horn Clay.

In New Zealand and Australia, farmers are wont to spray only 500 the first year and wait until the second to spray 501 because for some reason, they think they already have enough light and 501 would bring too much. Any comment?

Yes. Suggest to them to try the sequence 500 - 501 - Horn Clay and they will find that their fears go away. Clay will moderate between the two.

Now it is important to understand the real essence of 501 and that is not so much the bringing of sunlight to the plant but the balancing of the horn manure in the field as well as the balancing of the energy in the field - as we have said.

Nothing is so important as balance in a field. It is the essence and the very heart of agriculture. It is what sustains it. Nothing else does. Not even the life force energy. For without balance, the Life Force Energy cannot operate properly in the field.

Not to spray 501 is a very severe and serious mistake. They all must be used in the proper sequence for the BD method to really work properly. Not spraying it until the second year is just about as stupid as dunking someone in water to see if he or she is a witch or not. It is mere superstition. But without Horn Clay for their needs, it is understandable why they would fall back on this superstition in the south.

We would advise them to proceed as if everything will work out fine and use all three preps in the proper sequence, sprayed as close in time together as possible. One right after the other in two days. They will find that their superstition has no basis in logic, reason or reality.

And the use of 508?

508 balances 501. One without the other does not work as one with the other.

At what point does BD agriculture break down?

It is at the point of pure ignorance of the action of the preps and the philosophy of the method. BD will always work a little. With Horn Clay, we are not just talking about enhancements, we are talking about what is necessary

to bring Steiner's Agriculture into the next century. That is the essence of our teaching to you.

So if somebody sprayed it without knowing what he was doing and didn't care, that would be the "break down" point?

Yes. That would be it. Nothing would be gained from this activity that would be measurable.

And if the preps are used but the intention is not there, that would break it down too?

Yes, it would because the field would now be sensitive to the thinking of the farmer who believes that nothing will happen. So it was with [two wineries]. Both subconsciously (and not so subconsciously) wanted the system to fail. They got what they wanted. So it was too with the Sonoma mountain vineyard. They got what they really wanted.

What you think, you grow. The preps make that happen.

Would it be better to make barrel compost in wooden barrels or in a pit lined with brick?

We addressed this the other day with you. The presence of Horn Clay makes it possible to use either method with equal effectiveness. But in pits lined with clay bricks, that BC will be a little more potent than the same BC made the traditional way in wooden barrels.

The proper way to make it is to use Horn Clay and make four different kinds. You can apply the horn basalt to the barrel compost at a rate of 1/4 teaspoon per pit up to a filled barrel of manure. Do not add other manures to the BC as this will render the cow manure more or less useless. Stick with pure cow manure preferably from a farm with BD cows. You may use horn basalt at a rate higher than 1/4 teaspoon but no more than 1/2 teaspoon. That would be really pushing it. The lesser amount would be preferable.

As to the egg shells, use about 1/2 cup or ground up shells. Ground up so that they are fine in consistency. This will make an excellent BC. Sprinkle 508 on the top and you are on your way to creating the next generation of Barrel Compost.

As always, this is only one piece of the puzzle. You must use EVERYTHING in order to make it work. Everything means all the preps, the companion planting, BD compost and the AGG calendar. It is a complete system.

How do the six compost preps relate to Horn Clay?

Let us begin with the first, yarrow. Yarrow brings the soil into balance. That is the essence of it. Horn Clay helps in this process by freeing up the various elements and energies necessary to make this happen.

As to chamomile, it again frees up what is needed to make this work. And so it goes with all six preparations. The free and unimpeded movement of prana through these preparations in turn frees them for their various roles in the compost. That is all there is to know.

And 508, Equisetum arvense?

Again, we have a movement of the Life Force Energy through the plant and into the various plants upon which it is applied. But in the case of 508, we have the additional benefit of silica which brings with it the life giving light that plants need to be healthy. So here we can say that it makes the equisetum more effective in that it will bring even more light to the plant making its use as a fungiform more effective.

Does Horn Clay relate also to the crystallizing, metabolizing, assimilating, circulating and eliminating currents? And if so, how?

It does. Directly by allowing the pranic forces to enter into the material plane, into all living things to facilitate these currents or activities. That is why one feels a "rush" of good when putting the Horn Clay into a cosmic pipe. All these activities, essential to all life, are enhanced.

And so it is with the other elements of the astral and physical bodies. This relates to the sixteen gross elements in the physical body and to the astral elements of ego, mind, intelligence and feeling. So too does it relate to the thirty-five creative thoughts corresponding the combined thirty-five elements of the physical and astral bodies seen

in the causal body. Clay relates to EVERYTHING.

What happens if Horn Clay is applied separately, not in a sequence?

Very little. Horn Clay does not reflect back but it needs to be present when the horn manure and horn silica are present. We do not recommend that one apply Horn Clay separately as it is so essential for the activity of horn manure (calcium) and horn silica. Applying Horn Clay alone does very little. One would see very little physical evidence of its application. It is not like horn manure which if applied separately causes a great green growth or like horn silica which causes a great movement toward fruiting and seeding. Very little will be noticed.

How long should Horn Clay be buried?

Horn Clay absolutely has to be in the ground for a full six or twelve months. You are absolutely right about that. As to the fulcrum aspect, that is not quite right although this is a good analogy to begin an understanding of Horn Clay.

Clay mediates, that is, resolves the differences between the two - calcium and silica. Its position in between them is critical in that it is essential that a clay that is too high in calcium or silica not be used. Only one such as bentonite which has a very neutral content to it can be used with the effectiveness that is possible.

Clay does not act as a fulcrum in that it does not provide an actual center point about which calcium and silica revolve or balance. It MEDIATES. And in doing so, it balances.

It is essential for one to pick clay and bury it at the proper time and that would be at the Equinoxes. If you bury them early, or late, take them out early or late and they will be balanced properly.

Does it matter if it is a little early or late. I mean, should we use it in a field accordingly?

No. It does not matter but it is best to bury it at the equinox periods - within a week or two of each. What you buried last year will do quite nicely but don't take it out before the end of next month.

The reason for using 12 month clay to start is that the period of 12 months takes the clay through the entire calcium-silica cycle and at the same time, more importantly, takes the clay through both the formative and regenerative periods IN THE PROPER SUCCESSION. That is the key here. It is more important than just the 12 months, or the 12 moons, i.e. lunar cycles. Your attention should be focused on the involvement and completion of both the formative and regenerative cycles. By applying 12 month Horn Clay to the soil along with 500 and 501 (after only), you are relaying to the Earth and to the soil and the organisms in it, including the farmer, these formative and regenerative forces. You are overlaying a matrix of forces into which the calcium and silica elements can grow. This is very much like creating a vessel and filling it.

We are creating an archetype for the field and the field grows into it. It is not necessary to recreate this balance on the second application, only the specific formative (Spring) forces and the specific regenerative forces (Fall) need to be applied. Apply the Horn Clay twice a year, Spring and Fall.

Spring is the best time to begin a Horn Clay program because it is the time of year when the formative forces are rising to their peak. This allows the field to grow into the form or archetype. If started in the Fall, these regenerative forces are moving the plant into the state of chaos which is OK but not ideal. Spring is better because it is a beginning, not an ending. It is still understood that a Horn Clay program can be started in the Fall but it is a second choice, not a first choice.

Are life forces withdrawing from the fields?

This is true and plays a part but focus on the regenerative forces. There is a twofold action going on here. The earth life forces are going back into the Earth AND plants are going into a regenerative period of chaos. They are related and not related.

Are they causative?

In part. It would be better to understand it as achieving a harmony with the Earthly cycles, not a cause and effect of the Earthly cycles. That is to say, the fact that the life force energies withdraw into the earth during the period called winter does not create a seed. The plant is simply acting in harmony with the cycles that have imprinted

themselves on the plant. Again, a big difference.

Thus we can see why Luther Burbank was able to take a plant from Australia and make it act in reverse in the Northern Hemisphere. The harmony has been imprinted on the plant. In the North, it would not go to seed because it is Fall. It goes to seed in the Spring because that is what it is imprinted or programmed to do. Burbank knew this and used it to his advantage.

Always remember that the Earth is a whole, not bits and pieces of a whole and it acts together as a whole. It has had several billion years to create this pattern over its entire self.

When we apply Horn Clay, with 500 and 501, are we overlaying the archetype on the field?

That is correct.

Why does a field seem to go within itself when Horn Clay is first applied?

What we are seeing is similar to all homeopathic remedies acting on a body. The field goes within itself, to the core of the Earth as we have seen, and draws its form and substance from within. It then develops itself, its personality, its form into this archetypal form. That process can take a short period of time or a long period of time.

I have seen a decline in the effectiveness of biodynamic agriculture in the next 2 to 5 years as a result of the dogmatics and traditionalists not moving on to Horn Clay and other good advancements we have brought to BD. Is this accurate?

The new matrix that is just about formed will not permit the movement of the calcium and silica elements or influences to crossover to each other without clay. The new Millennium DEMANDS harmony and balance and nothing that is unbalanced nor inharmonious will be able to survive. Thus you will see a decline in the traditional biodynamics as it has been practiced throughout the world. Your task is to get the word out that this will happen.

The 1600 years of peace predicted by Scallion and others, such as Steiner, will demand many changes in the way people think, do and act. Those who fail to heed the demands of these changes will suffer the consequences. It is much like a fish living in oxygen starved water. It dies. Without the adaptations to these new vibrations, these new matrices and such, it will be impossible for the old ways to survive. Indeed, Mother Earth herself does not want them to survive as it interferes with the next stage of development being brought to the Earth.

What do we need to do to change the old ways and make them in tune with the balance and harmony required in the next age?

First and foremost is, of course, Horn Clay. We would like to see everyone use it the way given to you. Next is the multitudinous uses of the preps as has been given. Also it is necessary to use Steiner compost and companion plants and create the individuality as we have also given.

In short, you have all the basics to make the transition and we encourage you to give to everyone those basics. You need not worry about the specifics that we have developed for the various diseases and insect problems. If every farmer had and used all the preps the way given, worked with cover crops and companion plants and made and spread Steiner compost, the world would be changed instantly and agriculture would be saved. Until that time occurs, it is your job to bring it into the fields.

These are the primary components that you will need to make the leap.

When is “biodynamic” not biodynamic?

When there is a lack of commitment and a lack of results. There is no more to it.

What is the proper amount of Horn Clay to be applied to a hectare?

We would suggest that one and a half teaspoons would be sufficient. A level teaspoon for one acre is more than enough for that amount of land. One and a half is sufficient.

If a hectare is 2 1/2 acres, shouldn't we be putting on two teaspoons per hectare?

One and a half will be sufficient. You can use less of the Horn Clay on the acre measurement. 3/4 would be sufficient. We have been trying to get this info to you for some time. That is why you have been having some reservations about the one teaspoon level that you have been using as sensing it is too much. It really is unnecessary to use so much. 3/4 teaspoon would be sufficient we now believe.

Then why not two teaspoons for one hectare.

You could do that too. Don't get too hung up on the volumes of these preps. It is not necessary to put so much on the fields and still get the same activity.

So only 3/4 of a teaspoon is sufficient for all the Horn Clays per acre?

Yes.

Hand stirred?

If they stir it with a machine, it will be rendered almost totally useless.

Why?

Because the electromagnetic properties of the motor will neutralize all the etheric activity in the clay. The lack of attention to the intention will cause the clay to be guideless. Both will work together to make the clay useless no matter how long they stir it.

Regarding a biodynamic certification program, what are your thoughts on certifying grapes grown near power lines?

We have no real thoughts. It makes sense, we believe, that vines growing near power lines will be effected by the electricity coming from the power lines. On the other hand, with the addition of Horn Clay, we do not see it as a problem any more. The Demeter people, once again, are woefully unaware of the power of the preps and how we use them. So it should not be a real consideration.

How is the problem of spray drift and runoff effected by Horn Clay?

Let's look at spray drift first. In fields where you have applied the proper sequence, this is not a consideration. In fields where you have not, it is a consideration. So the solution is to spray the right sequence.

Now on to runoff. This is of greater concern than spray drift because this changes the fundamental etheric/astral balance in the soil. So we would encourage you to hit this one much harder by using water directional strategies and the extensive use of Cryptomeria and Hanoki Cypress to counter and balance these forces. Companion planting and protective planting is the key here. Once in place, it too is not a problem.

In general, what are the major differences between Demeter and Agri-Synthesis?

We see it as looking forward, and looking backward. But there is also the question of control. These blokes who call themselves selfless humanitarians are in reality, looking to control agriculture at the expense of those who would make vital and significant contributions to the art and science of agriculture. They are controllers who restrict freedom, not encourage it. So, in the end, they will fail. Agri-Synthesis Certified Biodynamic®, which encourages freedom and the REAL spiritual restoration of agriculture, will win out, ultimately. [Author's Note: Agri-Synthesis is no longer a company, replaced by GW Agriculture and Wholistic™ Agriculture. GW Agriculture now certifies crops and farms as Certified Wholistically Grown. Wholistic™ Agriculture is the only really correct reflection and interpretation of Steiner's lectures on Agriculture in the world today.]

Hugh Lovel asks, "Please examine my samples of bentonite Horn Clay and Georgia red Horn Clay."

Let's start with the red clay. This clay contains some iron deposits and with it comes the movement of forces related directly to magnetism as well as strength. With this prep, one can move to stronger areas of the farm. It also relates specifically to stinging nettle and is an antidote to too much stinging nettle on a property.

It also carries with it the characteristics of the Sun and with it the movement of the stronger life force energies such as you would see in the sun's ether. This particular Horn Clay is useful in all crops that grow above ground especially. It is most prominently displayed in crops that are greatly above ground such as orchards and bananas. This would not be a Horn Clay to use on root crops as it would "mineralize" them to such an extreme that they would become fibrous and stringy. But in the lighter elements of the air, it would do quite well.

As to the bentonite Horn Clay, one of the characteristics of bentonite is that it takes on the various variables of the local in which it is made. You will note that the red Horn Clay already has the physical and ethereal/astral characteristics of Georgia. Not so the bentonite when it was brought to the area. As bentonite goes through the changes in the horn during the year in the Georgia locale, it brings to itself the various regional characteristics that are similar to the red clay. This makes the bentonite resonate better with the horn manure and horn silica on your farm but it is not necessarily good as a Horn Clay in other parts of the country. Horn Clay is unique in that it is best made locally if you are going to take the greatest advantage of it.

We can also say that the bentonite Horn Clay is deeply embedded in the soil, so deep that it is especially good for the local substrata and basement complexes that underlay your area of Georgia. It works quite well in bringing up the various characteristics of the land and the various energies stored in the silicacious material deep within the Earth. This Horn Clay can work very well on all crops including root and orchard crops. It is not quite the specific use clay that is the red clay but it is an excellent general use clay.

I also point to the fact that you have made biodynamic preparations on your farm for many years and you have broadcast the BD preparations around your farm for many years also. So the red clay has had the benefit of this influence, no matter at what distance you mined it, which the bentonite did not. This is another reason that the red clay is different from the bentonite Horn Clay. This specificity is greatly enhanced by placing the red clay in a horn and burying it on your property. But again, I caution you not to use it on root crops without the probability that a fibrous crop will result.

All in all, both clays are superior in quality and radiate in a greater area than other preps that you have made. They are both specific for your farm and general for others. I would find that if others used your Horn Clays, they too would find that the effect would be beneficial but again, I must caution or recommend that local Horn Clay is the best for them.

As to whether or not the red clay is of the group midway between the elements silica and calcium, I can say unequivocally that it is in that range and suitable to use in the future as a Horn Clay if you follow my admonitions about the type of crops.

The last question is how will your farm animals respond to the different clays and the feed they eat grown using either or both?

This is a very interesting point. All the animals would benefit from eating food grown with the benefit of the preps including Horn Clay. As to this one, I would say, that on a general basis, I would recommend the Horn Clay made from bentonite rather than the red clay. The introduction of iron influences into a cow, for example, would interfere with her milk production and cause a "rusting" of the milk pipes. That is to say, the milk would begin to take on a metallic taste to it. Best stick with the bentonite clay for this purpose.

As to whether or not this iron influence would have an effect on the people who eat the crops, it would not but it is also recommended that an occasional stinging nettle salad would be beneficial for anyone eating such food. By occasional I mean at least once a month. Dried stinging nettle would serve the same purpose and even a warm tea made from the stinging nettle would be a welcome addition in the winter time when no fresh leaves are available.

Having said this about stinging nettle, I can also say that this is not written in stone. But the bodies of those who use food from red clay will find that their bodies more strongly attract iron influences. This can be especially good for those with iron deficiencies but especially bad for folks such as myself who have iron saturated blood to start with. But these are really minor concerns. Nevertheless, they are of some concern.

FOOTNOTES & DEFINITIONS

clay -> a detrital mineral particle of any composition having a diameter of less than 1/256 mm (4 microns). This is approximately the upper limit of size of particle that can show colloidal properties.

detrital -> pertaining to or formed from detritus, especially said of minerals occurring in sedimentary rocks, which were derived from preexisting rocks either within or outside the basin of deposition.

detritus -> loose rock and mineral material produced by mechanical means, e.g. disintegration or abrasion, and removed from its place of origin. Any fine particle debris of organic origin, e.g. plant detritus in coal.

colloid -> a particle-size range of less than 0.00024 mm, i.e. smaller than clay size. Any extremely fine-grained material in suspension, or that can be easily suspended, commonly having peculiar properties because of its very high surface area. A common colloid in nature is clay, which has such properties as plasticity, thixotropy, and swelling.

plastic -> capable of being deformed permanently without rupture.

thixotropy -> the property of containing colloidal substances, e.g. a bentonitic clay, to weaken or change from a gel to a sol when disturbed but to increase in strength upon standing.

sol -> a homogeneous suspension or dispersion of colloidal matter in a fluid. A sol is a more fluid form than a gel.

gel -> a jellylike material formed by coagulation of a colloidal dispersion. It is in a more solid form than a sol.

colloidal dispersion -> a suspension of particles of colloidal size in a medium, usually liquid; a sol.

clay mineral -> one of a complex of loosely defined group of hydrous silicate minerals, essentially of aluminum. They have a monoclinic layered crystal lattice. The extremely small particle size imparts ability to adsorb water and ions on the particle surfaces. Most clay minerals belong to the kaolin, smectite (montmorillonite), and illite groups; micas and chlorite are close relatives.

kaolin -> a group of clay minerals with a two-layer crystal structure in which each silicon-oxygen sheet is alternately linked with one aluminum-hydroxyl sheet, and having the approximate composition of $\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$. The kaolin minerals are generally derived from alteration of alkali feldspars and micas. The group includes kaolinite.

smectite -> a group of expanding lattice clay minerals of the general formula $\text{R}_{0.33}\text{Al}_2\text{Si}_4\text{O}_{10}(\text{OH})_2 \cdot n\text{H}_2\text{O}$, where R includes one or more of the cations Na^+ , K^+ , Mg^{+2} , Ca^{+2} , and possibly others. The minerals are characterized by a three-layer crystal lattice (one sheet of aluminum and hydroxyl between two sheets of silicon and oxygen); by deficiencies in charge in the tetrahedral and octahedral positions balanced by the presence of cations (most commonly calcium and sodium) subject to base exchange; and by swelling on wetting, due to introduction of interlayer water in the c-axis direction. The smectite minerals are the chief constituents of bentonite and fuller's earth, and are common in soils, sedimentary rocks and some mineral deposits. Montmorillonite, formally used as a group name in the above sense, is now considered a mineral of the smectite group.

montmorillonite -> a dioctahedral clay mineral of the smectite group, $\text{Na}_{0.33}\text{Al}_{1.67}\text{Mg}_{0.33}\text{Si}_4\text{O}_{10}(\text{OH})_2 \cdot n\text{H}_2\text{O}$. It represents a high-alumina end-member that has some slight replacement of Al^{+3} by Mg^{+2} and substantially no replacement of Si^{+4} by Al^{+3} . A term formerly used for the group of minerals to which the mineral montmorillonite belongs. Confusion is avoided by using smectite for the group name.

illite -> a general name for a group of three-layer, mica-like clay minerals that are widely distributed in argillaceous sediments, esp. in marine shales. They are intermediate in composition and structure between muscovite and montmorillonite, have a 10-angstrom c-axis spacings with substantially no expanding-lattice characteristics, and have a general formula $(\text{H}_3\text{O}, \text{K})_y (\text{Al}_4 \bullet \text{Fe}_4 \bullet \text{Mg}_4 \bullet \text{Mg}_6) (\text{Si}_8 \bullet \text{Al}_y) \text{O}_{20} (\text{OH})_4$, with y less than 2 and frequently 1 to 1.5. Syn: hydromica.

feldspar -> a group of abundant rock-forming minerals (aluminium silicates) of the general formula, $\text{MAI} (\text{Al}, \text{Si})_3 \text{O}_8$, where M can be K, Na, Ca, Ba, Rb, Sr or Fe. Feldspars are the most abundant of any mineral group and constitute 60% of the earth's crust; they occur in all types of rock. Feldspars are white and gray to pink, have a hardness of 6, are commonly twinned, have monoclinic or triclinic symmetry, and show good cleavage in two directions.

mica -> a group of monoclinic minerals of the general formula $(\text{K}, \text{Na}, \text{Ca}) (\text{Mg}, \text{Fe}, \text{Li}, \text{Al})_{2,3} (\text{Al}, \text{Si})_4 \text{O}_{10} (\text{OH}, \text{F})_2$. It consists of complex phyllosilicates with perfect basal cleavage, which split into thin elastic laminae and add range from colorless to black. Micas are prominent rock-forming constituents of igneous and metamorphic rocks. Sheet muscovite is used in electric insulators and ground mica in paint and as a dusting agent.

chlorite -> a group of platy, monoclinic, usually greenish minerals of the general formula: $(\text{Mg}, \text{Fe}^{+2}, \text{Fe}^{+3})_6 \text{AlSi}_3\text{O}_{10} (\text{OH})_8$. Chlorites are associated with and resemble the micas, they may also be considered as clay minerals. They are widely distributed, especially in low-grade metamorphic rocks, or as alteration products of ferromagnesian minerals.

bentonite -> a soft plastic light-colored clay formed by chemical alteration of volcanic ash. It is composed essentially of montmorillonite and related minerals of the smectite group. The properties of bentonite depend largely on its ion-exchange characteristics.

sodium bentonite -> bentonite in which the Na^+ is the dominant exchangeable ion. Sodium bentonite will absorb large quantities of water, increasing in volume as much as 8 times. It is widely used in oil well drilling muds, in pelletizing pulverized iron ore, and in bonding foundry sands. Syn. is Wyoming bentonite.

calcium bentonite -> bentonite in which the Ca^{++} is the dominant exchangeable ion. Calcium bentonites swell little more than ordinary clays but are highly adsorbent and also useful in bleaching and decolorizing.

fuller's earth -> a clay possessing a high adsorptive capacity, consisting largely of montmorillonite or palygorskite. It is extensively used as an adsorbent in refining and decolorizing oils and fats, and is a natural bleaching agent.

palygorskite -> a chain-lattice clay mineral, $(\text{Mg}, \text{Al})_2 \text{Si}_4\text{O}_{10} (\text{OH}) \bullet 4\text{H}_2\text{O}$; also, a group name for lightweight fibrous clay minerals characterized by distinctive rodlike shapes under the electron microscope. It has valuable bleaching and adsorbent properties.

cation -> an ion that bears a positive charge.

anion -> an ion that bears a negative charge.