

I'd like to create for you a little picture of a plant, what we could call a lawful plant, or a plant that is listening to the fundamental plant archetype of a root with a crown, and then a stalk above it with leaves and nodes, ending in a node where the calyx then unfolds and corolla, stamen and pistil into the seed. We can call that a lawful pattern for a plant. And many vegetables have that as a kind of ground plan and archetype. But when we look at an herb or a plant that has properties that go beyond simply nutrition, very often there is a displacement of that normal pattern.

Somehow within an herb an organ moves either up or down from its archetypal place in the archetypal plant. That displacing movement creates a kind of tension within the plant that results in its pharmacological action. This can then be seen in its life gesture and its structure. For instance, members of the labiate family have a displacement of the flowering process down into the body of the plant. In the labiate there is an oil process that's normally associated with flowering and seeding in the archetypal plant brought down into the leaf. So the displacement of a particular organ, or organ principal gives the gesture of this culinary family. The actual flowers might not be displaced because labiates have flowers, but they have in the body of the plant the essential oil process that would normally be part of the flowering process; they have that flowering gesture dispersed all the way through the plant.

There's a kind of displacement of the archetype into a different position, and then that displacement produces the pharmacological qualities, and physiological effects of the substances within the plant. Sometimes the displacement is a result of a particular ecological niche or climatological niche that the plant has to overcome, that it will displace an organ in a particular way. The plant forms an active principle or organ in order to fit into a particular niche.

I want to give that principle as a background to build a picture of the interaction of the two great parts of the plant archetype, the flowering process, where we have the action of the cosmos acting on the plant from the periphery, and the growth process, where we have the action of the earth and the water lifting the plant away from the earth. Growth is terminated by the flowering process, and the flowering process is inhibited by growth.

The more fertilizer available to the plant the more growth develops. This growth represses the flowering process. Through fertilizer I'm supplying too much of the earthy side of the equation. The more I restrict nutrition, and even water, than I'm enhancing the flowering and fruiting process at the expense of the growing process. So the cosmic side, the flowering, fruiting, oil-producing, protein-producing, seed-producing, fragrance-producing side of the plant is the cosmic pole, and that has to do with the limiting of growth.

And the opposite pole, the placing of vegetation, the development of a strong leaf or nod or root development, especially where the crown is is the earthy side of the archetypal plant. The crown is where the root and the stalk meet one another and it is a very critical part in a plant. The organs around the crown represent t an earthy gesture because the plant is working out its relationship to lower soil sap and things like that in order to make

the growth substances that it needs. And then gradually, over time, in the body of the plant, the lower saps; the more coarse substances are lifted into finer and finer forms: alcohols, esters, alkaloids, phenols, and things like that.

So the plant, when growing, is relating more to the earth; the plant when flowering is relating more to the cosmos. And the particular relationship between the organs of the plant can be displaced due to the forces that the plant is balancing. The displacing of a cosmic principle down or the displacing of an earthly principle up results in what we would call the life gesture of the plant. So, in general, the displacing of a cosmic principle down creates more refined qualities further down in the plant. The displacement of the earthly gesture up gives you a coarser kind of quality in the flower and fruit.

Life gesture is a tool for assessing the way in which a particular plant is balancing earth and cosmos. Whether it's a vegetable or even a perennial, by looking at the particular families of plants and the way they organize these forces, you can learn to see a coarse quality that moves up or a fine quality that moves down. Those properties create the life gesture of the plant. What I'd like to do is look at the life gesture of the valerian asking why the valerian could be related to the principle of Saturn.

What does Saturn mean, anyway? If we were to understand what Saturn as a plant would be, where would we find evidence of it? What kind of life gesture would we see in a saturnine plant and what effect do the forces of Saturn have on the action of a compost heap? To me, it's interesting that the valerians are also connected to Venus; it has a five-petaled corolla. The number five in the assessment of plant organs often refers to the influence of Venus. But Venus and Saturn are known as the virgin and the old man. They are linked to each other as a polarity. Valerian has a strong life gesture of extreme polarity so this Venus / Saturn polarity is just a part of its particular niche.

But let's look at Saturn because I think there are some really interesting pictures of what we could call a Saturn principle or a Saturn gesture that have a great deal to do with substances becoming more refined. Saturn in the old world was considered to be the gate through which the cosmos came into the incarnation. Saturn is the gate. It represents the action of the forces of the periphery. The forces of the periphery are warmth and refinement since at the periphery matter is going into spirit. The periphery is where the unmanifest archetype that stands behind the manifest plant lives as an active being. The periphery is the gate that the plant being comes through in order to become a manifest plant. The code word for that process of incarnation coming from spirit into matter is Saturn.

The force of the periphery is of the unmanifest world of chaos. And yet that chaos is ordered so that particular forms arise that will eventually become manifest. Chaos denotes potential not randomness. Chaos is the process where the unmanifest becomes manifest. We could also call it warmth. And when we call it that, we're using a code word from alchemy. We could call chaos warmth: warmth is the enthusiasm for incarnating. In chaos you are not quiet yet incarnated, but you're thinking about it pretty hard. You're kind of just coming near the edge a little bit to put your toe in the water of incarnation to

see whether or not you actually will manifest. Rudolf Steiner calls that Saturn gesture “chaos”.

The chaotizing of the lower plant is kind of volatilization of the organization. The plant when forming seed and flower are going to its own periphery, its own Saturn periphery. The plant when forming seed is volatilizing everything from below and is lifting what has become manifest into a higher level of organization. The higher level is a more refined, less incarnated form of organization. That’s what a fragrance is. A fragrance is a substance that’s going back to heaven. The flowering pole and the substances found there have a lot to do with consciousness.

So Saturn as a life gesture, represents the action of the periphery. Those forces bring the qualities of that which is beyond the horizon; the unseen, the unknown, and yet still somehow ordered. This pole represents the dissolving of the plant organs in order to produce a seed. The forces of the periphery chaotize the plant in order to induce the archetype of the new generation into the seed germ. All that I’m describing to you would be called Saturn. Saturn consciousness is the wisdom and warmth that holds everything that will eventually become manifest.

All of that alchemically could be called Saturn, the gate, the door, and the entryway for the light to come in. And that entryway for the activity of the light, that manifests in a warmth process, there’s another code word for that alchemically. When warmth activity becomes a substance, we call the substance phosphorus. Phosphorus means the one who is carrying the light. So phosphorus is the ultimate manifestation of the forces of warmth and light. We can barely hold phosphorus in an incarnation because it wants to escape back to the periphery. That urge to return to the periphery is Saturn, that’s the action of the periphery on what has become.

So whatever has become represents the action of the centric or earthly forces. These represent the forces of substance and matter, of earth and water. These are the earthly forces of manifestation. What has become manifest has to have a way to go back out into the infinite. So it goes back out through the gate that it came in, and that gate is then Saturn as a substance in plants that leads the more fixed elements of calcium and even sulfur as a kind of fixed fire back to the periphery. What leads the calcium out again into the periphery is phosphorus, as an activity that is polar to the salt process of incarnation. The gesture of dispersing and going to the periphery, that is phosphorus as a substance, or Saturn as a cosmic life gesture. There is a particular life gesture when Saturn becomes dominant in a plant. There’s a particular something we can look for as a structural key.

And for that I’d like to turn to Count Keyserlingk. This quote is from a little book *Developing Biodynamic Agriculture* published by the Temple Lodge. And the quote goes: “Saturnine powers are evident in the unusual feature in which a plant holds its stamens up high, offering them to the heavens in a wonderful sea of flowers, while the pistils are drawn to the earth, developing low down on the stem. A space is created in the horizontal, as stamens and pistil are held apart in a gesture that can also be seen in the

ringed planet Saturn.”

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Fig. 6

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Fig. 2

“This a strong polarity of the farthest out and the farthest in. It’s a kind of inner space.” And so the creation of an inner space, according to Count Keyserlingk, is Saturn. It’s exactly what we see in the growth pattern of valerian. If we look at *Figure 2* that little dark football-looking thing is actually a penny, and the little thing next to it is an ear of the original form of corn or maize known as teosinte. *Figure 2* is a picture of a cob of teosinte. And next to it is the cob with the stamens of the pollen former sticking up above it, all within the scale of a penny.

So the original corn cob was two inches tall. It was held on a grass plant and had two kernels. But in *figure 2* you can see that there is a separation of pistil and the stamen. In most other grasses the pistil and the stamen are embedded one inside the other. In oats and wheat the stamens hang out of the pistil for fructification, and then they fall off. But in teosinte, the pollen former and the seed former are separated by a stalk. And then over time, the forming through selection, the pistil has been moved farther down the stalk, and the stamens have moved farther up until now, there is a foot and a half to two feet of stalk between the pollen former and the pistil. That separation has been developed over time.

Audience: How many centuries?

You know the irony of all this, if you read about this, they say it happened in a couple generations as magic. It was like, oh, centuries of selective gathering. No, it was something else. Yeah, you would think it was centuries to develop that but the scholars are saying, “No, there are teosinte remnants found in pottery and then suddenly, there’s an ear of corn, just very close to one another, a couple of generations.

They have no idea how or why, but obviously there was some other way of working with plants, [*laughter*], that we have sort of lost. So it’s not just selecting, selecting, selecting, there is something else.

Audience: I just wanted to say in Mexico, they still plant teosinte on the periphery of their maize.

Yeah, it’s the great mother corn. Yeah. In my garden, if I’m growing carrots or parsnips, plants with fragile seed, I always leave two or three grandmothers to go to seed. I do that even if I don’t take the seed. It seems to make a difference to the other plants, if some of their family are allowed to go all the way to seed. So in teosinte there is a picture of a Saturn gesture.

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Fig. 3

Please look at *Figure 3*, which you can see is an image of the valerian. So you see below there on the left, a very fleshy crown and root, or rhizome, and then a very long stem with internodes going way, way up to an inflorescence, way up in the air.

Once again, we have a separation of a kind of earthy gesture down below, and then this heavenly gesture up above with a large space in between. So if we actually look at what a rhizome is and we compare that to the archetypal plant, a rhizome is a stem that's normally above the ground that's been drawn down below. So in one part of the valerian, we get a gesture of pulling the cosmos down, the stem is down under the ground. That's what a rhizome actually is. So we have a kind of pulling of the cosmos down. There is even the gesture of a strong aroma that permeates all of the vegetative parts. Strong fragrances down in the vegetative parts of a plant point to the pulling down of the cosmic into the earthly. And then there is a long separation in between the crown and the inflorescence until we get the sea of flowers held high up above that Count Keyserlingk described. The empty or hollow space in between is the mark of the Saturn gesture.

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Fig. 4

Now if we look at the flowering principal up above – in Figure 4 you see a flower, one flower, and you look at the little fruit or seed there at the bottom and then look at the tube corolla, you see the same type of gesture in the tube corolla going way up above the seed and the petals and the stigma of the style going up way even above that. The tube corolla encloses the stamens, and that little organ sticking out of the top is the stigma. What happens in the flowering is there's a pappus that is a modified calyx that eventually becomes the little umbrella like the dandelion that helps the seed to float away.

So here even in the flower, the seed gets lifted up and disseminated to the periphery. So in the valerian plant, there are two gestures; One is pulling the cosmos down into the root, The second is sending all parts of the flowering process out to the periphery. The gestural motif is the separating of the two principles in a Saturn gesture. So the Saturn gesture is the creating of an inner space, a space where something new can come, a space where the earth is pulled down and the cosmos is pushed up.

But a deeper insight leads to the perception that the cosmos is not pushed up from below but pulled up from above. We could ask is the flower moving away from a center, or is it going to a center? How can the periphery be a center? This question is an example of the kind of thinking that is necessary in order to understand the activity of Saturn. The conundrum arises from the insight by Rudolf Steiner that the forces of the periphery are not explosive they are suctional. And what that means is they have a center in the infinitely distant. The imagination is that earthly beings die into the periphery of the cosmic forces. The spirit leaves the body of flesh and goes to the periphery of the cosmos. That is the one pole. But the spiritual forces and beings die in the center of mass

of an entity that is manifest here on earth. Cosmic forces die here. Entities that manifest on the earth have a center here, and they grow towards and ultimately die in the infinitely distant. Growth dies in the infinitely distant. Spiritual entities dwelling as archetypes with infinite potential in the infinitely distant, grow towards their death within entities here that are manifest and have exhausted their potential in what they have become.

The plant archetype dies in the plant that's here on earth as a manifestation. These two paths weave across each other in the growth patterns of plants. The plant archetype dies in that particular plant, but the growth of the plant moving it towards the periphery creates a condition where the growth of the plant gives back to the archetype, what we could call a sense experience, a sense experience of all the things that it went through during its life process. And that is then contained within the archetype of the plant as an energetic template that moves back towards the forces of the periphery as the plant goes to flower and seed. This drama gets encoded in the seed process when it's driven to chaos. This is all an image of the work of Saturn, the gate of the cosmic forces at the periphery.

When I'm not incarnated, I live in another universe somewhere in the infinitely distant. When I'm incarnated I'm right here on this piece of earth in my own space. When those two processes come together in a form of life we call that form a plant. Every plant has a different way of organizing those two sets of forces.

Is the plant we see the true plant? The answer is no. The true plant is an energetic being that leaves a wake in its passing of an image of the archetypal being that holds the template of its existence. What we see as a plant is the wake or corpse of the passing of the true plant. The true plant occupies everything between the seed and the next germination. Once germination occurs the true plant is on the way to excarnation and leaves a matter permeated wake for us to use. The true plant is a rhythmic, sensitive, invisible activity unfolding in space. It occupies a space between the unmanifest and the manifest. The plant on earth occupies the space between the manifest and the unmanifest.

Some plants fill the space rapidly; others, like valerian, stretch that space out so that something new can enter in. Something different can happen when Saturn forces separate the manifest and the unmanifest. There's a kind of new enthusiasm for manifesting that can take place. And the valerian is a specialist at bridging the poles of the manifest and the unmanifest because it lives in the wet places, yet loves the warmth and the light. All herbs are specialists at somehow working out these kind of polarities. It's just that the valerian is a special specialist. *[Laughter]*. It unites many paradoxes; is it sweet or is it rank? The answer is yes. *[Laughter]*.

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Fig. 03

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Fig. 4

Is it light and warmth, or does it love the water. The answer is yes. Does it put us to sleep or does it wake us up? The answer is yes. And so in that Saturn activity, the space in the center where there is actually nothing strong forces can be developed. If you look at the picture of the valerian there in *figure 3*, you'll see there is a heck of a lot of internode space along the stem. There is a lot more internode space than there are nodes. And look at that one little floret there in *figure 4*. That tube corolla takes off like a rocket.

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Fig. 5

So the gesture of the creation of an inner space, the Saturn gesture, is then permeating the organs of the valerian. So in *Figure 5* there, you see this curious little diagram. The diagram with the two upside down pine trees is an image of what we could call a projector. That's a diagram you might find on a website where they'd be describing a pinhole camera. And the little "x" in the center where the lines cross, that's the pinhole.

Typically, if you go back in pinhole camera lore, the story goes that there was a yurt and there were shepherds sitting in the yurt. One day on the wall of the yurt, they saw the animals outside walking by upside-down. And when they traced the source of the image, it was a pinhole in the side of the yurt through which light was coming. The yurt was dark and the pinhole in the yurt was projecting the image on the opposite wall of what was going on outside. Legend says that that was the way the pinhole camera was discovered.

A pinhole camera is a camera that has no lens; it's just a hole. But that hole gathers in the light from what's on one side of the hole and focuses it into what's known as a projector point. The projector point or projector for short, then transmits the light to the other side of the hole completely intact, except that the image on one side appears upside-down on the other. The projecting point is called a projector. In the pinhole camera the projector has no lens in the center. The point gathers in light rays from one side and projects them to the other side. Saturn is all about projection of light from one side of the cosmos onto earth. As the cosmic gate Saturn brings what's coming from the outside and projects it to the inside. But in the middle where the projector is, there's a whole lot of nothing.

And in this cosmic dance between the unmanifest and the manifest the more nothing we have, the more something gets interested in the nothing. You know how that is. So the old saying was: "Nature abhors a vacuum." So where we have a space where there's nothing, it's like an irresistible space for something to manifest. So in the projector diagram in *figure 5*, what you see is a very curious phenomenon. The pine trees in the top diagram we will call normal. In the middle diagram the pine tree on the left is pushed out to the left. In response, the image of the pine tree on the right will get pushed out to the right. If I push the pine tree on the left to the horizon it will appear smaller. At the same time the image of the pine tree on the right will recede and become smaller. If I move the pine tree on the left so far that it disappears into the horizon the image of the pine tree on the right disappears at the same time that the pine tree on the left disappears.

Where do they both disappear to? Into the horizon. The horizon is the periphery around the place where I am in the world. It is the place where everything disappears. My whole world disappears about seven miles from the center of the circle of my visible world. At the horizon is a vanishing point. The vanishing point is a kind of projector out there on the periphery.

In the middle section of *figure 5* the action of the projector is to move things all the way out to the periphery, to the horizon. The real pine tree and the image of pine tree are linked by the action of the projector. Down below it, you see that the real pine tree on the left has come much closer to the projector. The projected image on the right follows suit and appears to come closer to the projector also. Scaling happens just by letting the projector in the middle do the work. And as I pull the real pine tree in towards the projector it appears to get taller. The image of that does the same.

If I pull the pine trees all the way into the center, they get so tall and narrow that they become a vertical line. Actually they meet and cross in the projector. If push the pine trees out in the middle and all the way to the periphery, they become a horizontal line. So the action of the projector in the middle, the space of the nothing, is a projector for the forces on either side of the projector. The projector is the space where the vertical and the horizontal meet in a point.

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Fig. 6 Saturn

So now I look at *Figure 6* and what do I see? I see a planet with a strong vertical axis, and also a planet with a whole set of rings in the horizontal plane. This is a strong polarity between the horizontal and the vertical. In the plant world every plant is an image of these two polarities of the horizontal and the vertical. But looking at valerian, what we see is down at the crown the horizontal force is dominating. In the flowering pole the vertical force is dominating. But here in the center, I have a strong separation of the two poles. In the valerian these two polarities of horizontal and vertical appear to be extremely polarized.

The archetypes of the horizontal and the vertical forces compose the field of activity that plants are using to unfold their life gestures. The younger shoots of a plant like the flowering parts appear to be more vertical. The older portions of the plant like the crown and root appear to be more horizontal. Young leaves of a growing tip point up. The older leaves of a growing tip point to the sides. So the vertical forces represent the new forces related to the cosmos, and the horizontal forces are the older forces related to the earth. So in the plant there is a constant alternation between the vertical and the horizontal forces. The life gesture of a plant is an image of the way that the plant is bringing these two forces into balance.

In the valerian, even in one flower we see that the vertical and the horizontal are quite polarized. The stronger those two polarities are in the plant the stronger the plant needs to

be to hold them in balance. The stronger the polarities are the the more dynamic is the action in the plant. The more they're neutralized, the more you move towards a vegetable. The more they get separated, the more it's showing that a kind of tension is acting in the plant, that's where you get the pharmacology found in the herbs and medicinal plants.

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Fig. 7

So the bulk of the book (*Developing Biodynamic Agriculture*- Temple Lodge publications) is about experiments they were doing after Steiner passed away and before the Second World War. Researchers in Europe were trying to develop different kinds of wheat and grain. And they did experiments with hollow trees as vessels for making special composts; *Figure 7* is just a shot of a hollow trunk of a plum tree. The hollow trunk is a Saturn gesture. They would go into the woods and find old fruit trees in old orchards. They would search out the hollow trees, and they would make composts in the hollow trunks. And then they would use that compost that was in the trunk of the hollow trees to spray and do seed soaks for particular grains. The goal was to change the phenotype of grain.

They were trying to get a rye that had many, many, berries on it, but very short awns. They were trying to see if they could actually use these forces of Saturn found in the hollow trunks to create special composts where they could make sprays and seed soaks to affect the way in which the plant was receiving the forces from the periphery.

Unfortunately during WWII they lived in a war zone, and many of their fields were destroyed by the passage of the armies and a lot of the records were also destroyed. But enough was saved to form the book. It's interesting to me that they would use hollow stems to build their special compost because they were trying to create a vessel where the hollow space was active. The hollow space in the tree as a sheath, like a horn or an organ. They were using a different kind of organ to bring the forces into focus. So hopefully you see a picture of these forces that we can call the Saturn gesture, Saturn is action on the periphery with a kind of hollow space in the middle.

So let's take a look at the action of valerian in the human, the root of the valerian because it's also a picture of these Saturn forces. As we start to look into the pharmacology of valerian, there are some really interesting pictures that come up.

When doctors or when chemists go to analyze what's in a plant, they have three groups that they work with. They have the alkaloids, which are found in the group of substances that an alchemist terms "salt". Among the salts; you have acids and bases. Both of those poles would be called "SAL". When you mix an acid and a base together a salt drops out of the solution as a precipitate. Alkaloids are in the sal pole alchemically.

Then chemists will look for what are known as terpenes. Terpenes are any substance that is associated with the forming of an alcohol. Alcohol to an alchemist was always called

“mercury”. So all kinds of oils and fats and things, waxes and things like that come out of different kind of variations of what could be called the Mercury Principle. Mercury is the process in the middle between sal and sulf. And then the third set of qualities that chemists look for when doing a plant analysis are the phenolics. Those are substances that bear similarities to both acids and alcohols but are like neither. These substances are the source of aromatic compounds like oils and fatty acids and things like that, what an alchemist would call sulfur or SULF properties.

So you have three qualities, a SAL, which is precipitate, an alkaloid, you have terpene, which is derivatives of alcohols; you can have enzymes and all kinds of things coming out of that, and then phenols are pretty aromatic oils. Those are the three kinds of substances that a chemist would look for in a plant. Now it turns out that over the years chemists have discovered that these three general categories of substances are highly active in Valerian. Valerian as a medicine has been known for centuries, and each new wave of chemists comes up with a new angle on what’s making the valerian work.

And each new wave of chemists that come up have different ways of analyzing substances so each new discovery points to a different substance as the active principle. Then the next wave comes and says, “Well, actually, it’s not that, it really is this.” So over time if you follow back from 1700s or 1600s when they first starting looking at substances analytically, everybody thought the active ingredient in valerian was something different and there was good evidence to show that the active ingredient was something different, but they could never pin it down.

They still can't really pin it down. They can't pin down the active principle because it’s all of them together acting synergistically. So first it was the acids that were active and then it was the oils, and then it was something else. Today no one can actually say for sure, what the active component is.

So it’s a kind of chameleon, the valerian is a chameleon. But valeric acid is the thing today that people are studying. There’s a lot of interest in it. The valeric acid has a lot of essential oils in it. Boron is one of the metals that is really active in valerian. And valeric acid has a property of affecting the central nervous system in a particular way. Here is a quote off of the web about the activities of valerian.

Most active ingredients(terpenes and phenols) are antispasmodic and sedative. The object of much research and interest, valerianic acid is thought to be composed mainly of borneol esters (a component of many warming essential oils) bringing balance to the relationship between the acid and alcohols. The significant warming of the borneol is thought to be the source of the sedative and anti-spasmodic properties of the oil. It is considered to be a "stimulating sedative".

We could ask what is a stimulating sedative? This seems to fit the polarization picture of valerian very well.

Valerian inhibits the destruction of GABA (inhibitory neurotransmitter in the central

nervous system synapses). This releases GABA which dampens the nervous transmissions in the synapses, depressing the central nervous system.

If we get excited, in the synapses a chemical is released that creates a kind of craziness, an excitement that makes the synapses much more active, so there's much more transmission among the neurons. GABA is a thing that inhibits too much activity. So the valeric acid supports the calming down of the synapses. And the place where it has most effect is in the superchiasmatic nucleus.

It also acts particularly on the sleeping and waking rhythms through action on the superchiasmatic nucleus (controls endogenous circadian rhythms). It is situated in the optic chiasma of the anterior hypothalamus where the optic nerves cross on the way back to the vision center of the brain. This organ is active chemically as a response to light passing across the retina of the eye. The superchiasmatic nucleus sends impulses to the pineal gland to regulate body temperature and the production of melatonin for sleep induction. Many neurological studies point to the action of the superchiasmatic nucleus and endogenous diurnal patterns that are influenced by temperature.

Now we could say, "Well, great. What the heck is the super chiasmatic nucleus?"
[Laughter].

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Fig. 11

That is a important organ for us. In *figure 11* you'll see the eyeball there. And the eyeball goes back – there's the optic nerve that goes back, and then you'll see it says suprachiasmatic nucleus goes up to the very middle of the brain. Now if you were to enlarge that little pea-like thing and look at it you would get the picture that's down there in *Figure 12*. And that's a picture of the pituitary gland.

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Fig. 12 Pituitary gland

The suprachiasmatic nucleus is the place where the transmission of light impulses that hit the retina in the eye is localized. With every sense impression in the eye, a nerve impulse is created that moves back through the optic nerves towards the optic centers in the back of the brain. On the way there the optic nerves cross and where they cross, the light transmission creates an impulse in the suprachiasmatic nucleus. It is like a relay. In the diagram of the suprachiasmatic nucleus, if you look there, you'll see those little star-like organs, those little flower-like organs.

Those are nuclei that are stimulated by the impulses of light coming from the optic nerve. Every time you look at something, these are the organs that are being activated in your head. Every differentiation between light and dark and every movement and nuance is registering in those little flower like organs up there. Nerve impulses are then transmitted down the nerve into the pituitary gland. The pituitary gland contains a vascular structure

that creates a metabolic response to the light impulse. The pituitary gland that secretes a hormone that stimulates the thyroid, that creates hormones that regulate reactions throughout your whole body. Those reactions stimulate further reactions that influence the action of your the pineal gland.

If you look at *Figure 11*, you'll see the pineal gland just to the right of the pituitary gland. The relationship between the pineal gland and the pituitary gland is that the pineal gland is the organ that helps you sleep, and the pituitary gland is the organ that helps you wake up. So valeric acid has a particular action on the centers where we go to sleep and where we wake up.

The pineal gland is a vestigial form of what used to be an eye that is still present in rattlesnakes. They have their pineal glands hooked up to their heat receptor. That is how they locate their prey. And we have a gland like that in our head but instead of locating prey, it's how we find our way back into heaven at night. We do that by looking for centers of warmth in the darkness. This is called going to sleep. But when we have spent enough time in the darkness, then we have to come back to other side to find the light. So valeric acid has a particular action on the way that light and warmth are alternating in our states of consciousness.

And the space between the pineal and pituitary is the bottom of the third ventricle of the brain. It's a space with nothing in it but fluid. And it's the space where according to Rudolf Steiner we form the inner pictures that support our day consciousness. What do those inner pictures allow us to have consciousness of? Through the action of the inner pictures we assess the relationship between the thing we're seeing with our senses and its archetype in the spiritual world. We call it recognizing something that I am sensing. I look at the flower – "Oh, look, it's all yellow," and inside somewhere I go, "Dandelion." This is the area in my body where these experiences are processed. These glands and organs allow me to unite the farthest reaches with my life here on earth. They allow me to connect the periphery with the center, the cosmos to earth. So in the realm of consciousness, the action of valeric acid on the consciousness on the human is a picture of the gesture of the herb valerian and what we could call the activity of Saturn.

Saturn is the door we go out through into sleep when melatonin is produced in the pineal gland, and it's the door that we come back through in the morning when we're called by the light that hits the suprachiasmatic nucleus and moves us into a state of awake-ness because because there are light impulses coming in through the optic nerve. We call it "waking up". And so the alternation of these two important states of consciousness is specific to the action of the valeric acid. It's just a perfect analog for the gesture of the valerian plant. It is what we could call Saturn consciousness.

It's the furthest out and the furthest in, and how they somehow speak to each other in the void, in the space, where we want to create a space where new things could happen. It is like the old corpses and offal and poop that turns into gold in the space of the compost heap. That is an inner space where the forces of the periphery and the forces of the center have to come together to somehow be in magical interaction. How does that happen? It is

a great miracle.

7-1-8...png

Fig. 8 Bone cross section

7-1-9...png

Fig. 9 Bone cell

Figure 8 and *Figure 9* are pictures of the structure of a bone because the end result of the Saturn influence is the formation of bone. If we took the warmth of Saturn and moved it all the way out to the periphery, we end up with ash. Ash is deposited in bone. And the form that bone takes is that there's a very strong peripheral activity on the periphery of the bone, and then in the center, there is openness. *Figure 8* is an actual cross-section of a bone. You see as you get towards the center of the bone, there's an opening, and at the periphery, you get a kind of concentration. Look at the picture of the hollow log and compare.

Figure 9 is one bone cell, where you see exactly the same gesture. You get a concentration on the periphery, and then an open space in the center. The bones are Saturn, that's Mr. Skeleton, Mr. Death, Mr. Doorway-to-the-Stars, you know, it's your skeleton. So the bone is a saturnine organ. We might take a cow femur and mix the valerian juice with bone marrow and stick that paste in a femur as a kind of an organ sheath for a prep. And it's just a thought, you know. *[Laughter]*. But hopefully you see there's something to think about there.

7-1-10...png

Fig. 10 Amethyst geode

Okay. So *Figure 10*, what I'd like to do is make a little bit of a shift here. *Figure 10* is a photo of an amethyst geode. And you can see in the geode a gesture that is similar to the bone and the tree. There's a concentrating or crystallizing activity on the periphery of the geode producing a bone-like process, and then there's a form in the center where there is nothing, apparently. So in a normal quartz crystal, there's a molecular kind of growing from a periphery. Molecularly that is how all crystals grow by adding peripheral layers of crystal solution to a seed that is forming in the center. In quartz the molecular layers are laid down around a central axis and rotate in one direction around that axis.

But what happens with amethyst is that the molecular growth of the crystal grows in two directions simultaneously. One molecular layer is right-rotating, and the next molecular layer is left-rotating, and they alternate that way through the whole crystal. The result is that the finished crystal seldom shoots along the long axis but tends to form along the horizontal axis and then is often present with adjacent crystals in the form of a hollow geode.

7-1-13...png

Fig. 13 Cabbage

So years ago I became interested in amethyst as a possibility for an alternative silica spray. In *figure 13* you see that Polish looking guy holding a big cabbage. That was taken about 12-13 years ago when I first started working with amethyst to make a spray to try to grow cabbages because I have a very heavy clay soil in the heat oven called the Central Valley of California. And I can't grow cabbages in the spring; I can only grow them in the fall because the clay soil heats up so slowly. However in the Central Valley in the fall, it's often extremely hot in September and October, the times when I need to get them in the ground and off to a good start so that by November when the light is shutting them down they have grown to a good size.

Because my soil is so slow in the spring, I could only get fall cabbage. By the time the light shut down in the fall, the cabbage would only get to be a one pounder even in really good soil. So I was looking for something that would give a gesture of a wrapping of the leaves around a center for the late summer to give the cabbage an early boost of cabbage archetype. I didn't want to spray 501 in September because the silica would turn the cabbage into Jack in the Beanstalk. So I wanted something to bring a silica boost for light assimilation but keep the light on the moist side. At that time I didn't know about the molecular aspects of amethyst but I looked at the geode and something in the geode said this is what you want.

The gesture of the geode with the crystals on the periphery reminded me of a lettuce or cabbage with its leaves forming on the periphery. So I ground up the amethyst and put it in the cow horn and sprayed it. The result was that cabbage in *figure 13*. That year the temperature hit 105 degrees in late September. The cabbage was in about its eighth leaf, and I thought, "Oh my god, this is the end of my cabbage." But the cabbage never took a hit. When you cut into them, they were moist and sweet. Those cabbages never received any overhead watering, but they were savoy and the crinkled spaces inside the leaves were filled with beautiful rainbow shining droplets of water.

All I did was spray them with the amethyst spray. It was good soil, but I sprayed them with the amethyst spray when the moon moved through water every ten days. I wanted to enhance the water. So over time I've made that spray as a regular part of my gardening practice. And then I was down in San Jose and read a book from the Rosicrucian Library down there. And in that book was an analysis of what were known as gem ferments. And I knew that in Rudolph Steiner's work, late in his life was very interested in gems. That fact gave me the original thought that I should look into gems. And so in that book that I got from the Rosicrucian Library it said that the ferment for the amethyst was wine, red wine.

So I got some red wine and I put my ground up amethyst out of the cow horn in the red wine and starting spraying that, and it seemed to have a little bit of a kick to it. I put the pulverized gem in the horn, then take it out, and then put it in the red wine and let it stew in there a little bit and then take the juice and use that very dilute in water as a spray.

7-1-14...png, 7-1-15...png, 7-1-16...png, 7-1-17...png, 7-1-18...png

Fig. 14 Butternut squash, Fig. 15 Fennel, Fig. 16 Fennel Section, Fig. 17 Foot long carrot, Fig. 18 Foot long parsnip

I've been working on my garden soil for about 18 years, I add all kinds of alfalfa and compost in there ever year. It was pottery clay when I moved in there, but it's really beautiful, dark loam now and I know what to expect when I put a carrot in there or when I put a squash in there. I know that squashes grow this way; carrots grow that way. I feel that helps me to assess experiments that I do because noticing irregularities is easier.

The pictures in *figures 14 through 18* are pictures of produce that I grew and sprayed with the amethyst spray. Not all of the butternuts look like that one in figure 14, but there was a characteristic form in them that instead of a kind of fat belly where the seeds are and then a tapering fleshy part, the fleshy parts began to elongate in the plants sprayed with amethyst. Compare the picture of the squash fruit with the valerian flower. The same kind of elongation and separation of the two poles is present as a gesture. Not all of them were like that, but I typically select seed squash for that quality. It's very nice to have a big fleshy neck on a butternut rather than a tapering small fleshy portion with a big seed cavity.

I sprayed the butternuts as an experiment and started to see that elongated type of fruit arising with more frequency each year. And then I thought, well, hey, I'm gonna go spray my fennel because a long fennel bulb would be great instead of a squat bulb with too many leaves. So there's a fennel that was sprayed, that little ruler there is one foot long making that a pretty nice fennel. And some people have said, "Oh, I would never eat a plant that looked like that. It's atrophied." But *figure 16* is a cross section of the fennel.

If you look down into the core you can see very harmonious growth patterns. I'm getting the hollow space filled in with leaf after leaf of fennel. That's what I was looking for. And then the carrot in *figure 17* also has the same elongated center filled in with harmoniously structured tissue. That carrot is a foot long. That's a Danvers carrot, but the shoulder and the tip of the root, come out like a block. Danvers carrots typically taper sharply towards the tip. This is a carrot that is grown in clay soil.

And those of you that are gardeners know you can't fertilize a carrot to grow big. Put fertilizer in to the carrot bed and you get something other than your carrot. And the parsnip in *figure 18* is the same; that's a foot-long, parsnip with three and a half to four inch crowns that have an elongated middle section of harmoniously formed tissue. These vegetables are sweet all the way through. There is no hypertrophy. The growth is balanced through and through.

Audience: Are you selling your preps?

No, I don't do that. This was supposed to be a prep workshop where we share research, right?

Audience: I'm just teasing.

I'm bringing this to you because I think there are other things that could be done in the realm of preps especially regarding the use of gems. There's tourmaline, which I think could be really a great prep somewhere down the road. And we're working with wine diamonds, you know, wine tartar, to see if we can get that to do something down the road. As a result of these amethyst experiments I'm adding valerian drops to the amethyst wine solution. From what I can see amethyst as a gem has a mineral gesture of valerian.

I use a half a teaspoon of the amethyst spray in a quart of water, and then four drops or so of valerian into that. And then agitate it and stir it like a prep, and then spray that. I spray it in the evenings when there's frost in winter. I spray it in the evenings in the fall on the brassicas.

So this is research; it's ongoing. I think it's moving a little bit beyond the valerian, but there's a consciousness in the valerian that I feel is put out into the heap of how periphery and the center can be united in a common space in which new things can happen. Thanks.

[Audience applause]

Audience: Can I just ask you a question about wine and what do you think the wine is doing? Is it working somewhat like blood as a carrier?

I think that the wine is very enzymatic. So for the preps that don't have a sheath I think things like wine or honey might be an interesting alternative. In the other preps the sheaths provide a kind of organ-forming activity. There's a forming principle having to do with the action of an organism. And I think the whole question of appropriate sheaths and what they contribute is a place where some really good research could be done. I think with the substances in the preparations themselves; there has been a lot of work. But the thing that intrigued me about the experiments with the hollow plum trees was that they were looking for the sheath contribute a specific something to the formation of grains.

If you talk to winemakers, they're alchemists. They really understand how substance is an analog of what the plant went through that year. And that's what your wine appellations are about, or the concept of terroir, and the properties of a vintage. "Oh, that's a good year." Why? "Oh, just taste that." People who are connoisseurs of this, they can tell you what the climate was doing in that grape that year just by tasting it. So there's something in that perception of qualities that I think brings up the whole question of this sheath for this quality enhancement. I think these are largely unanswered questions.

So the picture I had was that the wine is a kind of enzymatic sheath. It is a kind of stomach of the grape vine. The stomach actually comes from the yeast that forms the bloom that is on the periphery of the grape.

Audience: Do you think that there are other sheathes?

Yes, I guess my quick answer is that I think there are other sheaths. But the issue is finding the right analog process to the activity of the sheath. It's not just that it is a sheath; it's that when the sheath was part of an organism, it had a particular function, and that function is carried over into the substance as a synergy between the substance and the sheath.

So all the phenolics that are valuable in a wine grape come from the skin. I mean winemakers; their whole bank account is based on the skin of a grape. Except for the white wines, then it's the oak barrel. That's the skin. That's the sheath. That's where they get their tannins. I think that everything has its proper sheath that can be used for enhancement purposes. Years ago, there was a book called *Commonsense Compost-Making* by M.E. Bruce. She was a vegan, and she was interested in the work of Biodynamics, but she didn't like the idea of the killing of the cow. So she did work with honey and beeswax as sheaths.

Audience: They come from an animal.

[Laughter]

That's right they do. But we don't have to kill the animal to use them. So that was her thing. So I had the idea that we could make a bisque-ware pottery and then dip it in hot beeswax as a sheath and mix minerals with honey. I thought that that kind of sheath might be good for things like the barrel compost. I mean this is experimental stuff here. So, for instance, when I do the barrel compost, it's hard to get these little nail kegs now. I try to use a sheath of clay, but I get the most porous bisque pot that I can, and then I just paint it with beeswax, and then I mix honey in with the manure and rock powders when I do my mix of the barrel compost. I think it makes a much better mix.

And the mix that comes out actually looks like a piece of leavened bread. It has a little air pockets in it, and it looks like a loaf. So I think there's ways to experiment and play with sheaths using Maria Thun's recipe but I think there are more active sheaths. I think there are different ways of bringing those forces to bear in a slightly different way. So I look at the wine as a kind of sheath. Maybe we could get a goat's skin or goat stomach or something like that like the old people did – a goatskin as a ferment sheath to see if it would do something.

Audience: That could apply to other ferments as well since wine is a ferment, then you could experiment with other ferments.

I think what we're doing in preparation making is a kind of fermenting. It's an enhancing of a substance in a particular way so that it morphs into something more potent than it is originally. That method of enhancement uses the principle of synergy. The skull of an animal has a particular relationship between calcium and silica and phosphorus. The skull is calcium phosphate. That's just what the valerian chemistry is about. Please look at

figure 1. In figure 1 you can see that the action is from calcium to phosphorus. This relationship links the most immobile calcium to the most mobile phosphorus.

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Fig. 1 Valerian

So if you look at an herb like comfrey, you'll see something very similar to valerian, although not quite as articulated. Comfrey is knitbone. The forces in comfrey knit calcium and phosphorus. Bone is calcium phosphate. The radiation in valerian is the dynamic in comfrey.

Audience: How much honey are you putting into it?

Just kind of like a chocolate chip cookie.

[Laughter]

Audience: How long are you fermenting the wine?

I just make it in the spring, and then put in there and I just let it sit out there until I use it. Nothing special.

Audience: I was just wondering have you ever worked with or considered amber?

Yeah, amber is difficult to render because it's been fossilized. So it's very different to render because it requires pretty noxious substances to get it to go into solution, pretty strong hydrocarbons. Whereas this amethyst ferment technically is not actually a ferment. I've had chemists say, "Well, you're not actually fermenting the gem. It doesn't actually ferment. And that's technically true. But the grinding of this gem to very, very fine parts is producing a particle size that is highly interactive with a solution.

So in essence, it's not a true ferment, but particles at this size are very reactive with solutions that are enzymatic and have an altered pH. Tourmaline especially is incredibly reactive with very, very small changes in pH in the solution, which is why I think it's a very interesting gem to look at and to play with.

Audience: Have you ever used an amethyst geode as a sheath itself?

If I had the bucks, I might.

[Laughter]

I get mine down in Brazil when I visit there; I get it in a little store. You go into the little box where there are just funky little pieces of tourmaline but if you have the patience and know what you are looking for you can get some nice pieces for grinding.

Audience: Earlier you mentioned the original type of corn plant and how you made

reference that you thought that it might have been a couple of centuries for the change in the plant. And then you made the comment that you had heard that the change was only several generations.

That's what the scholars say.

Audience: So what I'm wondering, and this is something I thought about for a long time, is that the ancient seed breeders were looking at the plant, looking at the inner growth of the plant, and at specific times in that gesture where there's that space growing from one stage to the next, if there wasn't a certain sound that they could utter that created that – that made that jump, made that change, I mean it was a human-influenced sound, I would say the sound actually made the change. What do you think?

I would say that that would be possible. But I think, today, we could add a dimension to that idea. That sound was given to them from the movement of the planets, that they got that sound from the periphery. And today where I would go to take this a step further is say watch what's happening in the planetary realms on the day when you grind the amethyst, watch what's happening on the day when you shake it, watch what's happening on the day that you spray it. And try to work in time that way. The sounds that served the sacred works in the past really were the music of the spheres.

If you pay attention to how you work in time you will actually creating a kind of sound potential in time. Your rhythm of working in time is actually a kind of melody. I think that's where Steiner would go. Maybe it could also be a kind of toning but that would take a lot of research to corroborate.

Audience: The role of the planets moving the time makes the tone. Is that what you're saying?

The movement of the planets in time is a tone. It is a tone. It is a kind of singing. And what we call "time" is actually a word like unfolding of what could be called a melody. We can learn what that melody is by learning to read an ephemeris. If we start to replicate our actions rhythmically in time, the will that we use to do that would be the same kind of will that the old people used when they sang the seed. I think there's a way to do that except we can do it in a more cognitive way. Personally I would think that would be a kind of modern or contemporary way, so that we would avoid the pitfall of witchcraft, which is "I'm going to sing you bad".

Audience: A spell, you mean?

Yeah. I'm gonna find what your seed sound is, and then develop a little radionic device to kind of neutralize that. So we can do these things, we just make an oscillator and tune it and intend that you're having a backache. And that's the danger of this work. And even during Rudolph Steiner's time, there were some people who were a little nervous about the fact that he was burning things like animal skins at particular times of the year. And they were a little nervous about it because it was getting on the edge of some things that

eventually were used in a wrong way by some not such nice people.

So you know these things work. I think there's a kind of cleaner way to do those kinds of things today, having to use our intellect rather than allowing the sound to come down in an unconscious or magical way. Later, in a couple of evolutionary cycles when we all meet again and when we've cleaned up our act a little bit, we'll probably be doing that. We'll be singing the world again or doing eurythmy to make our gardens' grow. But for now, I think there's another interface that we have to learn that challenges us about the moral aspect of what we are doing. We have to find out what is the harmony of the music that's already being played by the cosmos. And if we sing that, then maybe we can sing some new things into being. Thank you.