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Goethean Science: A Phenomenological Study Of Plant Metamorphosis

The following is the first segment of a thesis written as part of the author's work at Prescott College toward a degree in Environmental Studies, with an emphasis in Agroecology. The remainder of the piece will appear in upcoming issues of this journal.

Natural system – a contradiction in terms. Nature has no system; she has, she is life and its progress from an unknown center toward an unknowable goal. Scientific research is therefore endless, whether one proceed analytically into minutiae or follow the trail as a whole, in all its breadth and height.¹

—Johann Wolfgang von Goethe

Introduction

We live in an age of increasing polarization among theories regarding the nature of life. Some claim that the mysteries of life and the human being will unfold with the deciphering of the genetic code, while others urgently demand that science be morally, socially, and environmentally responsible for its findings and its association with technological “advancements.” Quantum physics reminds us there is no true line of separation between the observer and the observed – that the world does not work



in linear ways. For even the most determined material scientist, nature is a non-linear dynamic system. The wholeness of nature can not be found through a dissection of its parts. Do we include this concept of wholeness in our scientific practice? Many scientists and large corporations reduce life to a material commodity as they patent seeds, trademark research laboratory animals, and genetically manipulate plants and animals for herbicide and pest resistance. This approach to the natural world has led to the compartmentalization of the farm, where annual and perennial plant cultivation, forestry, and animal husbandry were once practiced together as a living system.

It is this materialistic approach to nature, which places more emphasis on quantity, measurement, and isolated experiments to "explain" life than on relationships and personal experience, that the poet, playwright, and scientist, Johann Wolfgang von Goethe (1749-1832) was wary of two hundred years ago. He proposed a participatory methodology for studying and discovering lawfulness in the natural world. The essence of the natural world is growth and change, constant interaction between both the living and the non-living realms. The relationships between various beings in nature are not linear, but reciprocal and simultaneous, generating what has often been referred to as a web of life.² One may find deeper meaning in seeing that the very same patterns and processes at work in the natural world are also at work in the individual human being. Goethe states: "If we would arrive, to some degree, at a vital intuition of Nature, we must strive to keep ourselves as flexible and pliable as the example she herself provides".³

Life and living processes are not linear, but they are directional. This directionality follows patterns that obey the laws of nature. It was through his mission to discover and "see" the unity and lawfulness of nature, and especially through his observations of plants, that Goethe discovered and developed his theory of metamorphosis. He gave definition and deeper meaning to these laws through his studies in anatomy, botany, zoology, osteology, geology, and meteorology.

By allowing and training ourselves to become active in our thinking, and to "grow" and change with phenomena (plants, animals, landscapes, etc.), we attempt to understand how the processes of becoming and of dying away are manifested and at work in the natural world and in ourselves. This type of seeing is not meant to replace the conventional scientific method, but to enhance it by exploring phenomena in a different way. From a sense of wholeness, we can see intrinsic relationships between the "parts" of a system, and can enter into our relationship

with this system with appropriate action. Environmental work such as ecological restoration and agriculture, where the human being works in an intimate relationship with the natural world, requires this ability if work is to be appropriate for, and an extension of, the landscape.

"Steiner maintained that if artists could school themselves to apprehend the inherent principles manifesting in, and giving order to, natural phenomena, they could create forms with an inherent consistency. The result would not be naturalism – a copying of nature – but a free expression of the underlying formative principles working in nature."⁴

If these types of work are done out of a sense of the whole, the work belongs to this whole. In this way we may aptly serve our fellow species and the landscapes in which we live.

Goethean Science and Phenomenology

The most basic tenet of Goethe's scientific method is that we enter into the experience of the phenomenon itself, remaining with it throughout our research, rather than speculating beyond it or replacing the phenomenon with an abstract concept or mathematical model. By dwelling in the phenomenon itself, Goethe maintained that one could come to "see" the unity and lawfulness of the natural world. In his scientific studies, he was seeking to explain nature by laws of development lying within nature itself, not external forces located outside nature.⁵ In this sense, Goethe's approach was truly phenomenological. A phenomenological science draws theoretical concepts from the structure of phenomena themselves rather than from an imperceptible reality assumed to be behind them.⁶ This approach places emphasis on the scientist's perceptual capacities and underlines the primacy and immediacy of sensory phenomena as reliable sources of true information.⁷ "Insofar as he makes use of his healthy senses, man himself is the best and most exact scientific instrument possible."⁸ We do not need to exclude ourselves or our senses, only our judgment, from the scientific process in order to practice good science.

Goethe did not accept the replacement of personal observation and study with the use of instruments and measuring devices, which tend to substitute the experience of the object under study with a mathematical construct. This replacement may well serve in the accumulation of information, but it does not lead to an understanding of the phenomenon or of how we should interact with it. Through direct and deep experience, he sought the underlying idea or law of nature itself, the ideal from which the diversity of experiences unfold in the sensory world.

"Goethe wanted to show how all the individual branches of natural science – natural history, physics, anatomy, chemistry, zoology, and physiology – must work together in order that a higher kind of contemplation may use them to explain the shapes and process of living beings."⁹ His goal was to create a new science, a general morphology of organisms (Steiner, 1985).¹⁰ He sought meaning not through isolated individual phenomena, but through the relationships of different forms.

In taking a phenomenological approach, "scientific investigation becomes individualized – a process profoundly dependent on the person and his or her capacities to see pattern, form, and the archetype within the multiplicity of nature."¹¹ Goethe recognizes this individualization and does not consider it an obstruction to the validity of the science; rather, it places responsibility on the scientist and allows for the development of the scientist in the process.¹² The practice of the Goethean way of science is an exercise for scientists as they test and develop their ability to "see" the unity of nature as it manifests in the multiplicity of its parts.¹³ This approach requires the "delicate empiricism" Goethe calls for in the scientist – that one maintains an inner state of openness and willingness in which the phenomenon may present itself.¹⁴ Self-awareness in thinking is as important for the scientist as attentiveness to the phenomenon under study.

How can an individualized science be a reliable source of knowledge? Goethean scholar Frederick Amrine writes,

"I submit that Goethe's (method) is a(n) attractive solution to this dilemma. His counsel is twofold: first, trust in the appearances; and second, accept the role of the thinking self in perception, but reflect its powers back upon the self in striving for a higher kind of objectivity."¹⁵

The method is a "balance between selflessness in contemplating the phenomenon and the activity of the self in structuring experimental conditions."¹⁶ The fear of subjectivity dissolves through consistent effort and the rigorous and self-critical methodology of the scientist. Experimentation is not tested against an abstract mathematical expression, which replaces the phenomenon, but against the phenomenon itself.¹⁷ "All phenomena have a rational conceptual structure. A full understanding of phenomena would bring their rational structure to self-consciousness, which must be the goal of phenomenological science."¹⁸ In this respect, the scientist, making the best use of her senses, intuition, and thinking skills, will remain true to the experience of the phenomenon.

In order to understand Goethe's way of science, one must practice it, which requires open and discerning

attention and discipline in observation, absent of judgment. Goethe warns against an anthropocentric approach to the natural world; rather, he seeks to know phenomena in and of themselves.¹⁹ For example:

"A far more difficult task arises when a person's thirst for knowledge kindles in him a desire to view nature's objects in their own right and in relation to one another. On the one hand he loses the yardstick which came to his aid when he looked at things from the human standpoint; i.e., in relation to himself. This yardstick of pleasure and displeasure, attraction and repulsion, help and harm, he must now renounce absolutely; as a neutral, seemingly godlike being he must seek out and examine what is, not what pleases. Thus the true botanist must remain unmoved by beauty or utility in a plant; he must explore its formation, its relation to other plants. Like the sun which draws forth every plant and shines on all, he must look upon each plant with the same quiet gaze; he must find the measure for what he learns, the data for judgment, not in himself but in the sphere of what he observes."²⁰

Goethe puts faith and trust in the aesthetic and thinking capacity of the human being. Scientific study should bring us closer to nature, not separate us further from our experience. Goethe maintained that scientific study could bring about a metamorphosis of the scientist herself. "Every new object, well contemplated, opens up a new organ within us."²¹ The scientist becomes the instrument through which the phenomenon reveals itself. Two hundred years ahead of his time, Goethe signaled an urgency for the reunion of human beings and the rest of the natural world through pure experience and understanding. I feel there is a great need to embrace the fact that the very patterns we see in nature are visible to us because we are a part of nature and therefore the patterns are also in us, physically and psychologically.

Archetypal Phenomenon

The inner lawfulness in nature that Goethe sought to experience was what he called the archetypal phenomenon (*Urphenomen*).²² The archetypal phenomenon is the ideal unity of a phenomenon from which the diversity of experience, or forms, arise. "[Goethe] wanted to seek out the idea of nature where it revealed itself most clearly and then to descend from the perfect to the imperfect, in order to understand the latter by the former."²³ "Goethe sees in each individual form only one particular development out of one ideal archetypal being which lives in all forms."²⁴ It is the idea that we can come to know

phenomena in their most complex and perfect forms, and from these ideals we can understand the more simple and imperfect forms as they are expressed through the diversity of what we observe in the natural world. "Diversity arises through the fact that something which is the same in idea can exist in different forms in the perceptual world."²⁵ With this approach we do not eliminate or reduce the complexity of nature. Thinking moves in the opposite direction from reductionism, whereby the complexity of phenomena are usually replaced with or reduced to more simple constructs.

The experience of the archetypal phenomenon is not a finished product, but a pure activity.²⁶ Steiner calls it "a higher-order experience within an experience."²⁷ "By training one's observational skills and by becoming increasingly aware of one's cognizing activity, the student would be led towards an experience of the 'idea within the reality'."²⁸ Through this activity one comes to see how the whole (the idea) is not an accumulation or summation of the parts (the experiences). Rather, the whole can be seen in every part, and every part, rightly seen, becomes a reflection of the whole.²⁹

"Universal and particular, idea and experience enter into a relationship that transcends logical subsumption. They become reciprocally determinative and, in that sense, a unified and organic whole."³⁰

The whole (the idea or archetypal phenomenon) is reflected in each particular experience of the phenomenon. "Indeed, nothing is more typical of Nature than that she carry out her whole intention into the smallest division."³¹ Seeing the wholeness and belongingness among parts that may have initially appeared separate or unrelated provides context and meaning and brings us home to the natural world. One sees the general and universal patterns and relationships as they are manifest through the diversity of experience.

Metamorphosis and the Archetypal Plant

"Metamorphosis [is] not the outward alteration of one form into another but differing outward expressions of an inward idea."³² By studying how a plant develops, from seed to seedling, growing into maturity in flower, and returning to seed, one can explore Goethe's idea of metamorphosis. Goethe developed much of his ideas concerning metamorphosis during his botanical studies, through rigorous and repeated observation, description, and comparison. From his studies he discovered what he called the archetypal plant, the plant within which all plants – past, present, and future – are contained, and from which all forms arise. The archetypal plant is both an idea, containing all potentialities of "plant-ness," and something Goethe himself could "see,"

could experience. It is here, in the archetypal realm, where the paradox of experience and idea unfolds and dissolves. One experiences the idea of the phenomenon.

"Everything is leaf, and through this simplicity the greatest manifoldness becomes possible," noted Goethe in his *Italian Journey*.³³ The node and leaf together is the simple form of the archetypal plant. From this simple form the diversity of the plant kingdom arises. "In metamorphosis the organism reveals the constant within change."³⁴ This constant is the primal organ, the leaf, which is transformed through the life cycle of a plant into the various metamorphic stages we see. The diversity of the plant kingdom arises in just how the different species uniquely express this law of metamorphosis.

In his *Metamorphosis of Plants*, Goethe describes how the archetypal organ undergoes a threefold stage of expansion and contraction throughout the life cycle of a plant. He sees the flowering plants as the most complex and ideal forms in the plant kingdom, and therefore strives to understand the laws at work in them before descending to the lower plant forms such as ferns and bryophytes. Here we see in his methodology the idea of the unity in multiplicity – how the archetypal idea is reflected within every part.³⁵

The first stage of expansion takes place as the seed germinates and the plant grows into its "leaf stage." Within the leafing of the plant we can also see a transformation. Riegner describes the plant as existing within polarities of illumination and humidity, between soil (dark and moist) and air (light and dry). As we move up the stem of a plant (or from a moister, low-light climate to a dry, high light climate), leaves tend to change from rounder and less differentiated forms to ones that are more incised, differentiated, and contracted. At the end of this stage the leaves contract into the calyx (the whorl of modified leaves or sepals).³⁶

The second stage of expansion in plant metamorphosis can be seen in the corolla, the whorl of modified leaves called petals. Within the flower a contraction and separation next occurs and can be seen in the contracted structures of the pistil and stamens. These separated parts come together again through pollination in the fruit, the final stage of expansion. Within the fruit the ultimate contraction to seed completes the circle of threefold expansion and contraction in the plant.³⁷ We can see the archetypal plant in one of its infinite manifestations through each particular species' expression of this metamorphic sequence.

"Our task, then, is to learn to see plants in such a way that each species' place within the overall organism of the plant world becomes apparent. The

archetypal plant is the creative element in the plant world. If one wants to explain an individual plant species, one must show how this creative element is working in a particular case.”³⁸

The potential to glimpse this idea of the archetype of a particular plant is present in every part of the plant, in every shifting transformation in its metamorphosis. Is there a point in a plant's development where this “higher self” is most available to the observer, most refined and perfected? Klett maintains that the truest expression of the plant being is manifest in the flower.³⁹ “It is a stage in which a higher principle (the archetype) is at work, and in which the character of a species or family is most clearly expressed.”⁴⁰

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Goethean Science: A Phenomenological Study Of Plant Metamorphosis – Part 2

The following is the second segment of three taken from a thesis written as part of the author's work at Prescott College toward a degree in Environmental Studies, with an emphasis in Agroecology. The third part of the piece, focusing on the use of dandelion, valerian, and stinging nettle in the making of the preparations, will appear in issue Number 232 of this journal.

Biodynamic Agriculture as a Practice of Goethean Phenomenology

"Looking to the future, to farm will mean not only to practice science, but also to perform an art, and ultimately also to follow a religion—all at once" (Klett, 1990, p. 29).

The biodynamic agricultural method, as an extension of anthroposophy, Rudolf Steiner's spiritual science, is Goethean in its vision and efforts to create a farm as a "self-contained individuality" (Steiner, 1993, p. 27). The farm is seen as a living landscape, an evolving individual organism within which the farmer lives and works. The subject/object (farmer/farm) distinction dissolves into a relationship in which the farm and its components (soil, plants, domestic animals, wildlife, water, etc.) are interdependent and necessary parts of a whole, rather than a mechanism for production, as is often the case in conventional and even organic farming. With this view, the relationship between the farmer and her farm is phenomenological. The unique wholeness of the farm is expressed in every part, and the farmer strives to experience and understand the system as a whole in order to work intimately and effectively with the landscape.

Biodynamic agriculture takes an expansive macro-view of all that may be influencing the farming system, including the cosmos and its cycles. One looks beyond the perimeters of the farm itself, striving for an ecological/bioregional approach: to see the farm as a landscape shaped by the terrestrial and aquatic ecosystems of which it is part, as well as the social and cultural context of a place. By seeing the farm not only as a result of all of these influences, but also as a unique individual organism reflected in each part, the farmer is involved in a phenomenological relationship. In biodynamics one seeks to allow the farm to develop into itself through this co-creative partnership.

Biodynamic agriculture seeks to grow food that nourishes human beings on a spiritual level and ultimately to heal the earth through cultivating forces in the natural world that would not be there without the intervention of the human being. Biodynamic preparations are applied to the farm "to enliven the earthly itself," so that the earth may participate in the future evolution of the human being (Klett, 1996; Steiner, 1993, p. 68). "Our work is to create the body within which the farm individuality can develop into the future" (Klett, 1996, p. 19).

In biodynamic agriculture the idea of the "farm organism" is not metaphorical. A farm is a living landscape, a true individual spiritual organism comparable to that of an individual human being. "Our work structures the physical body of the farm organism through soil cultivation, the life-body through plant cultivation and landscaping, and the feeling-body by caring for the abundance of animal life" (Klett, 1990, p. 17). Manfred Klett discusses the biodynamic preparations as organs of perception. The preparations act in the farm organism as sensory and soul-spiritual organs do in the human being. "We have to search for and prepare substances which can become the physical carrier of soul-spiritual forces in the same sense as our individual bodily substances are carrier of our spiritual being, our ego" (Klett, 1996, p. 15). "The goal of all the preparation work is to enliven physical substances to become receptive to forces working from the future to the present" (Klett, 1996, p. 39). They are the human being's spiritual 'manure' in a sense, "our contribution from the spiritual levels of human beings" (Klett, 1996, p. 47).

Steiner writes, "through an understanding of metamorphosis one can come to be at home in the organic world" (in Böckemuhl, 1981, p. x). Just as through the use of the biodynamic preparations one enlivens the soil of the farm, the farmer enlivens her own thinking through an understanding of metamorphosis and transformation (Steiner in Böckemuhl, 1981). This dialogue between the farmer and the farm is phenomenological in that the farmer's capacities for observation and experience, clear thinking and developed intuition, allow her the ability to "see" what and when actions are appropriate and necessary. The work of the farmer develops out of this dialogue

and therefore is a reflection of the farm system. The ability to see wholeness and relationship, transforming and growing, is essential if the farmer is really to be of service and create a healthy relationship with the landscape and living beings with which she works.

Art and Science

One can not easily relate the insight gained through Goethean research to another person through words alone. The other person must also participate in the experience. Art is a medium through which one can enter more deeply into the process of the phenomenon being studied, and also through which one may be able to relate this inner experience and understanding to others. "The abilities we acquire through scientific schooling must be complemented by art – by the ability to seek for the spirit in the images of natural phenomena. Only from this source can responsible action arise" (Böckemuhl, 1981). In practicing a Goethean methodology, science is individualized, but this does not mean that the attempts are purely subjective and dismissable. Jochen Böckemuhl (1981) describes the Goethean method as one in which the empirical and the expressive merge into a new science, in which the observer, making the highest use of her sensory and cognizing capacities, is able to perceive the lawfulness in nature through the study of the phenomenon itself. This view is contingent upon a world view in which man is a part of nature, and the lawfulness which is observable in nature also exists within the human being. Through creative expression of her experiences and observations, the scientist can test herself against the phenomenon, enter into a dialogue with the phenomenon, and relate to others the insights or secrets she may have glimpsed.

A Phenomenological Study of Plant Metamorphosis

"All beings in nature have a physical body which is an expression of pure wisdom" (Klett, 1990, p. 30).

Introduction of Project

To begin exploring the Goethean methodology, I undertook a project studying the metamorphosis of three plants: valerian (*Valeriana officinalis*), dandelion (*Taraxacum officinale*), and stinging nettle (*Urtica dioica*). These plants are three of the six plants used in making the biodynamic compost preparations, developed by Rudolf Steiner. On biodynamic farms and gardens, the preparations are used through manuring to enliven the soil and help sensitize the cultivated plants. I chose to study these plants in order to practice Goethe's scientific method, to explore through a phenomenological approach what is

the essence of these plants, and to gain insight into why they were indicated by Steiner seventy-five years ago in his lectures on agriculture. I wanted to develop for myself a new way of "seeing" and experiencing the natural world, and to blend formal scientific botanical observation with more expressive and "subjective" practices of artwork and creative writing.

An underlying question that inspired my exploration of the Goethean approach was the question of whether bio-regional biodynamic agricultural systems should use preparation plants and animals that are native or at least "naturally" growing in the areas of practice. Are the European herbs indicated by Rudolf Steiner in the Agriculture course meant to be used worldwide? If not, should one seek replacement preparation plants which work analogously in the farm organism, or would one find need for plants to fulfill different roles particular to the bio-region and the forces at work there? Steiner maintains that the only preparation plant that could not be replaced is the stinging nettle (1993). If we are to explore using native or bio-regional plants (and animals) in making preparations in different parts of the world, the insights and research into which plants are appropriate will not come out of solely materialistic research methods. I did not expect to answer these questions as part of my project, but to explore the Goethean methodology through studying the nature of the individual preparation plants more deeply. Perhaps through a Goethean phenomenological approach to studying plants, one could begin to develop a way of seeing that could lead to answers for the above questions.

Methodology

This project spanned five-and-a-half months, from mid-May to mid-November, 1999. I did my research while interning at the Kimberton CSA, a biodynamic garden that provides seasonal vegetables, small fruits, and flowers for about 180 families around Kimberton, Pennsylvania. All of the biodynamic preparation plants were growing in or around the garden. The flowering of dandelion, valerian and stinging nettle was generally successive, allowing me to focus mainly on one species at a time.

For my research procedure I used a Goethean approach developed by Jochen Böckemuhl and discussed in his "Elements and Ethers: Modes of Observing the World" (1985). The researcher takes a five-stage approach in observing phenomena. The "first impression" is the initial stage, after which each mode of observation corresponds to one of the four classical elements of nature: earth, water, air, and fire (warmth). This method was also used by Nigel Hoffmann in his essay, "The Unity of Science and Art:

Goethean Phenomenology as a New Ecological Discipline," (1998) from which I drew much inspiration for my project. The procession of this method parallels the three stages Goethe described and experienced: the empirical phenomenon, the scientific phenomenon, and the pure phenomenon (1988). The stages are steps along a continuum of deepening study. The distinctions provide a structure to help the researcher to be conscious of the ways she observes and thinks. Throughout my study I returned again and again to the earlier stages to check myself as my observations and thoughts of the plants deepened and developed.

Through the stages of observation and cognition, I tried to allow the plants to express themselves to and through me. Maintaining the "calm openness and willingness" that Goethe calls for in a researcher was a difficult task. It required discipline in thinking and self-criticism to avoid premature judgments and imaginations that had no intrinsic relation to the phenomena I was studying. Through my exercise of this methodology I was able to enter deeply into my experience of the plants while becoming aware of patterns and limitations in my thinking and observing. My observations and artwork are truly individualized; I do not claim they are representative of the essence or archetypes of the plants under study. They are reflective of my experience of the plants and were used to deepen my understanding of the metamorphosis of plants as seen in these species.

The first impression is just that; it is the impression or feeling one receives from the plant upon first encountering it. It is the feeling of wholeness and uniqueness of the plant, before one looks closer and begins to notice and differentiate the particular details. The aim is to make conscious the initial encounter (Hoffmann, 1998).

In the earth stage one describes the plant in detail in its physical, solid form. It is a sensory experience of the phenomenon, in which the details are explored and described as exactly and systematically as possible. This stage could result in the endless accumulation of more and more information, but this is not the point in the Goethean approach. This is the stage in which conventional science usually remains, penetrating the physical nature of the plant through further and further dissection into the organs, tissues, cells, and genetic material of the plant. The next stages of the Goethean approach move in the opposite direction of this conventional approach, seeking to understand the wholeness of the species, asking questions of the plant's meaning and nature, how it uniquely expresses, through its metamorphosis, the idea of the archetypal plant.

In the water stage, one begins to look for relationships between the parts observed and studied so closely in the earth stage. One begins to see the plant as a living being that changes through space and time. Is there a pattern to this transformation that is particular or expressive of the nature of this species as well as telling of the plant world as a whole? In this stage the observer may practice what Goethe called "exact sensorial imagination," whereby the observer uses her imagination to "grow and transform with" the plant as it metamorphoses (Hoffmann, 1998, p. 133). "The forces that cause metamorphosis in the outside world are active within us when we can see this metamorphosis" (Klett, 1996, p. 11). This stage challenges one to become fluid in thinking, in imagining the changes (seed-vegetative-flowering-fruited-seed) that take place in the non-observable world and that are seen in the sensory world only as snapshots in time. The patterns with which the plant divides and grows, flowers, and fruits shed light into this dynamic being.

In the air stage, one takes the fluidity of the water stage and internalizes it further, looking for the "gesture" that is expressed through the transformations of the plant. "A gesture is not merely a movement but, rather, an action through which a definite meaning expresses itself" (Hoffmann, 1998, p. 134). Air is a substance transparent and amorphous; it is the carrier of other elements, but is not itself visible. "It is characteristic of air to expand in all directions, offering its own being in order that the being and activity of another can appear" (Böckemuhl, 1985, p. 26). With this idea of air in mind, Böckemuhl asserts that we reach the cognitive attitude corresponding to the element. "An inner readiness is thus created for that which manifests in the world to reveal itself in us, as an image which discloses a being" (Böckemuhl, 1985, p. 26). We use our imagination to take in this gesturing – the idea behind the formative movements of the plant – and attempt to express it verbally, pictorially, poetically, or in some other way to bring it into the sensory world. Klett describes how plants come to expression most perfectly through their flowering and relates this to the thinking process in the human being.

"The same force that is active in thinking is active in the outside world as the force of plant growth. In thinking a life process is active. The thinking activity is an inner life process which remains unconscious. The very moment it comes to an end, that is, it becomes conscious, it dies into the thought. From this point of view, life forces are active wisdom. The forces in thinking are related to the forces that allow the plants to grow. In plant life they also die, but in

blossom, whereas in thinking they die into the thought. In the flowering stage the wisdom of the plant being is manifest. In the same sense as plant growth ends in the blossom, so the thinking activity culminates in the “blossom” of thought. Both are revelations of reality on two different levels. That is why our thinking can lead us to the truth in nature.” (Klett, 1996, p. 10).

Throughout the air stage one becomes more in touch with one’s own thinking process. One comes closer to the idea or the archetype of the plant through “imaginal manifestation” (Böckemuhl, 1985, p. 27).

The fire, or warmth, stage, is the final stage of research. This stage correlates with the intuitive mode of thinking. This is the stage of Goethe’s “pure phenomenon,” in which one experiences the archetype of the plant (Hoffmann, 1998, p. 135). Böckemuhl (1985, p. 30) writes,

“We experience warmth directly – either within us or as the condition of our environment relative to us. It is the element which penetrates and energizes everything, and which also can destroy everything from within. . . . Warmth is an immediate presence, full of content but undifferentiated. We are at the limit of what can be called a mode of observation. The warmth enters us – our inner activity itself becomes an organ. We do not experience the outer expression of a being, we become aware of its inner impulse.”

In the fire stage one feels the potency of the plant internally through intuition. “Goethe talked about expressing the archetypal phenomenon in terms of short, pregnant sentences that he compared in their cogency and symbolic power to mathematical expressions” (Hoffmann, citing Hegge, 1998, p. 135). One may attempt to bring this expression of the plant as “theory” into the sensual world artistically through writing and painting. It is in this stage that one sees how the plant relates to its environment through its role in the landscape.

Applying the Goethean Methodology to Three Preparation Plants

Dandelion (Taraxacum officinale)

Dandelion is in the *Asteraceae* family, the largest angiosperm families with 1,160 genera and 19,085 species. Many are important economic, food, or medicinal plants. Distribution is cosmopolitan, with many especially well adapted to temperate, montane, or dry regions. Dandelion is in the *Lactuceae* (*Cichorieae*) tribe, of seventy genera and 2,300 species (Zomlefer, 1994). Dandelions can

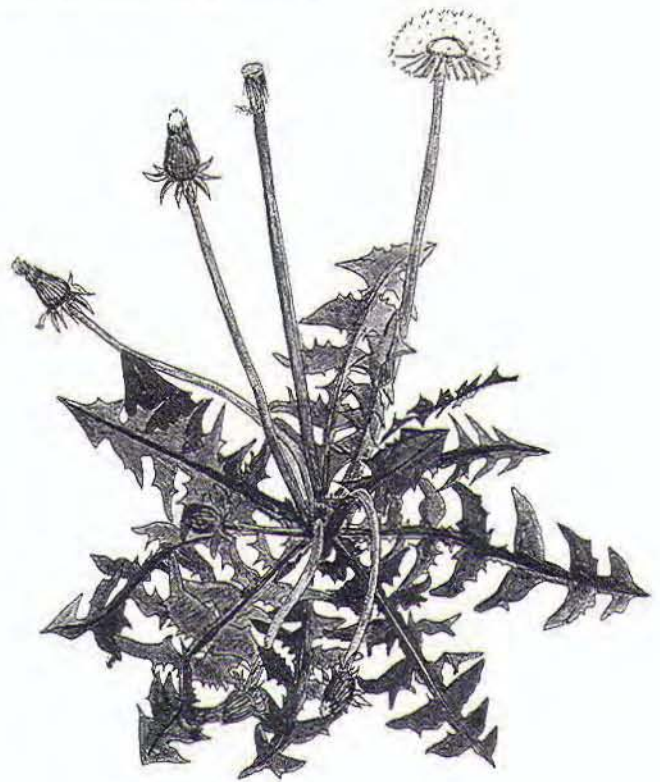


Figure 1.1. *Taraxacum officinale* – Plant sketch

grow from either seed or root cutting, and have the ability to produce viable seeds without the aid of pollen (Böckemuhl, 1981).

FIRST IMPRESSION:

Blankets of bright yellow-spotted green spread over the garden’s grassy areas. Colonies of potent yellow discs, dense and low-growing in the green. Looking closer, golden blooms stand on straw-like pink and green-glowing stems, above toothed green leaves, gentle rockets uplifting into to the air.

Dandelions seeding:

Shimmering silver heads of light

lanterns in the garden, floating over the dark earth.

EARTH

Two rounded seed leaves (cotyledons) sprout from the dandelion seed. The true leaves that follow are arranged in a basal rosette and grow generally prostrate to the ground. The leaves are deep green, varying from light to dark, often with dark reddish purple midribs and edges. New leaves grow out of the center of the rosette. The indentations in the leaves vary greatly between individuals but are generally deeply incised, almost to the midrib (fig. 1.1 and fig. 1.2). Incisions are more extreme (cut away)

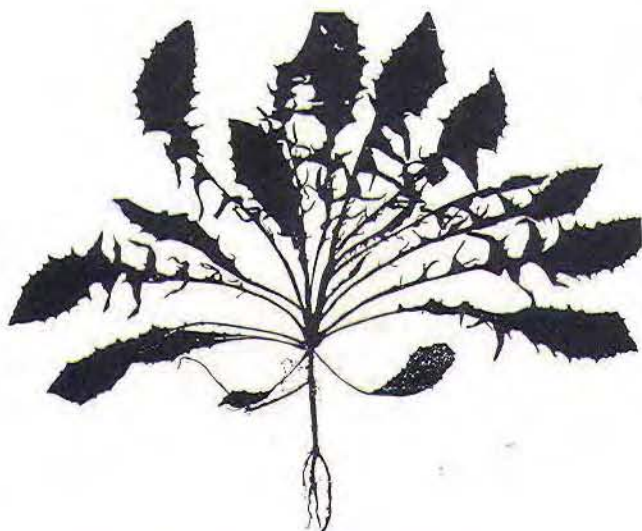


Figure 1.2. *Taraxacum officinale* – Pressed plant showing basal growth pattern and leaf morphology

toward their base and less so toward the acute apice (tip). Leaves are bitter tasting, as is the sticky white latex sap that runs through them and the flowering stem. Veination is branching.

The leafless flower stem of the dandelion is flexible and hollow, yet turgid and often lighter green than the leaves, with varying shades of reddish purple throughout. Fine white hairs cover the leaves and flower stalks, more densely toward the center of the rosette. The bud is tightly enclosed in numerous dark green, sometimes red-tipped, bracts, which hang down below the head of the open flowers. The bright yellow, umbrella-shaped flower head consists of hundreds of separate disk flowers in which the calyx is a reduced pappus and the corolla is fused into a tubular structure. Stamens are also fused, and one dark yellow bi-partite stigma stands just above the rest of the flower. The uni-carpel ovary is inferior and very

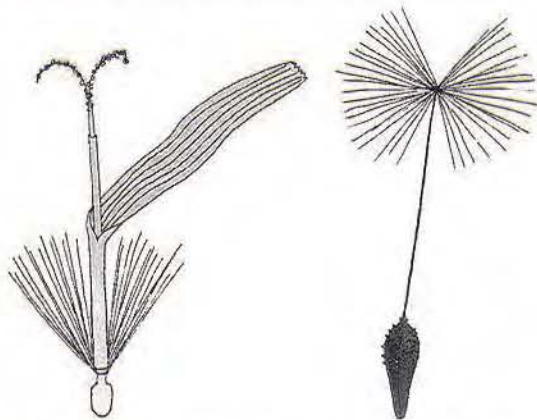


Figure 1.3. *Taraxacum officinale* – Fruit (left) and seed

small. The seed head of one dandelion inflorescence appears as a white globe, holding hundreds of these tiny seeds (achenes), each with a feathery white pappus. Achenes are rigid, angular and bumpy, brown, 1-2 mm in length, less than 1 mm wide (fig. 1.3).

The main fleshy taproot of the dandelion goes deep into the ground and is bitter to taste. Small side-roots branch from the main taproot.

WATER

The three stages of expansion and contraction that Goethe refers to as the archetypal metamorphic sequence

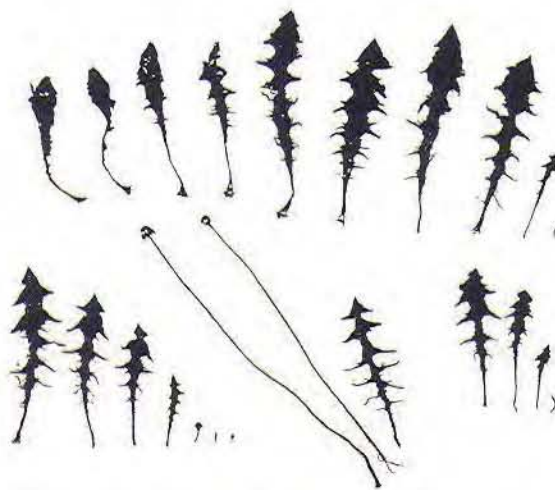


Figure 1.4. *Taraxacum officinale* – Leaf metamorphic sequence of one individual. Top, leaves from oldest to youngest (left to right); bottom, plant divides into three sections, leaves within each shown oldest to youngest (left to right).

in plants are readily visible in the dandelion. Due to the short length of my research, and that most of the dandelions I studied were in mowed areas, I did not follow one individual dandelion throughout its entire life cycle. Thus, the leaf sequence (fig. 1.4) is not fully complete. Still, transformation with age can be seen from more general, rounded leaves to more deeply and sharply incised leaves. For a more complete dandelion leaf sequence see Böckemuhl (1981, p. 58).

One can also see the threefold expansion and contraction within the movements of the dandelion's growth (fig. 1.5 and fig. 1.6 on next page). Leaves, which were oriented prostrate to the ground, appear involved in the next contractive movement: they orient themselves vertically, enclosing the new bud before it rises on the leafless stem. The bud expands into an inflorescence of hundreds of tiny flowers. Within each flower, the tubular yellow corolla may be seen as expansion, and the separated stamens and pistil are contractions, which come together

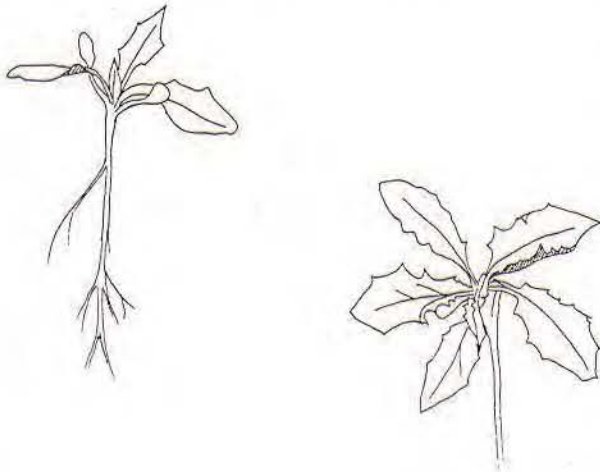


Figure 1.5. *Taraxacum officinale* – Seedlings

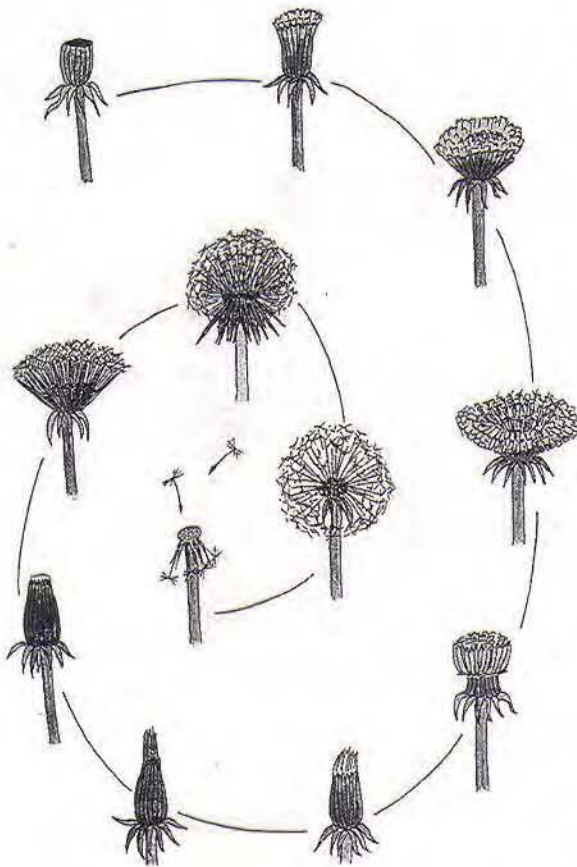


Figure 1.6. *Taraxacum officinale* – Metamorphic sequence from bud to seed

again to form the fruit (expansion). The inflorescence continues to open and close daily as the individual flowers mature (a movement from the center of the inflorescence toward the periphery). At peak maturity the inflorescence

is again enclosed in the bracts in a contractive movement. The inflorescence unfolds (expands) for the last time as a white globe of seeds, the ultimate contraction in the dandelion's metamorphic sequence.

AIR

The stages of development transform through a repeated opening and closing; with each, a new expression of dandelion unfolds. The powerful sun-like flower opens on a risen stem. It feels open and willing, and ultimately closing, transforms into silver seed, which is given over to the wind.

The dandelion seeds are everywhere; they are weightless in the wind. Omnipresent in the garden, dandelion makes itself visible in the blankets of green leaves, golden discs, and old silver lanterns. As yellow flowers, they stand shielding and welcoming, wide-open to the sky yet low to the ground, intimate with the grass and darkness below.

Making home of every nook and cranny, the grassy fields and gravel parking lot, the fencerow. Persistent and bold in habit and taste, tender and flexible of leaves, stem and flowers. Quick movers and growers, they create and embrace opportunity with openness, refined strength, and persistence through changing forms (fig. 1.7).

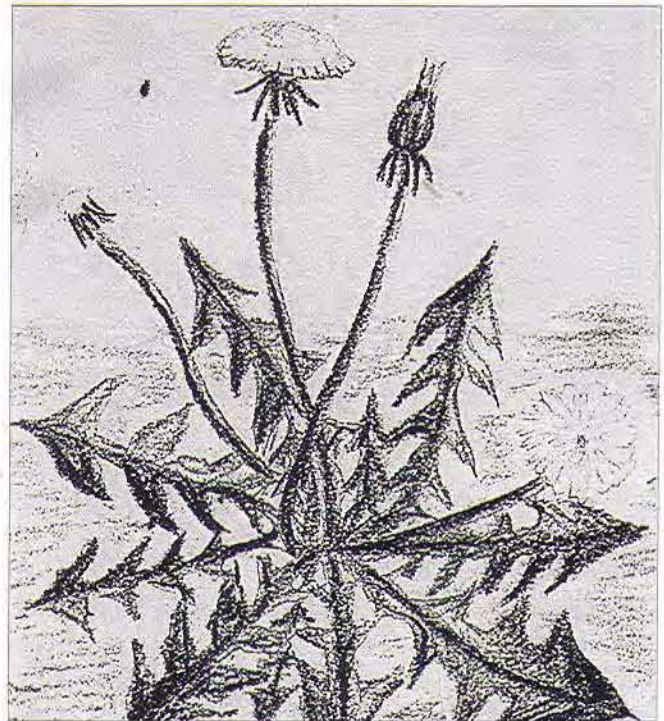


Figure 1.7. *Taraxacum officinale* – Gesture sketch

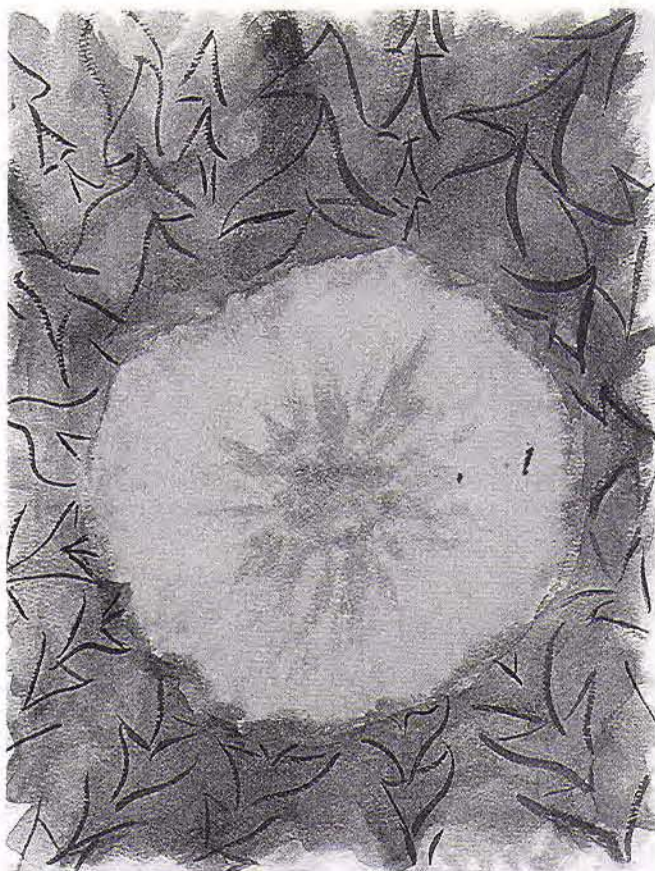


Figure 1.8. *Taraxacum officinale* – Image of plant as theory

FIRE:

At home, the garden
mirrors and welcomes in the sun
through strong yellow flowers,
warm and round in their openness (fig. 1.8).

Valerian (*Valeriana officinalis*)

Valerian belongs to the family *Valerianaceae*, merged by some into the family *Caprifoliaceae* (Zomlefer, 1994). The genus *Valeriana* includes 150–200 species of perennials, and occurs worldwide except for Australia. *V. officinalis*, also called garden heliotrope, is found widely in Europe and east to Japan (Bown, 1995). It is a well-known and widely used medicinal plant. The genus is distinguished from others in the family by having three stamens; a small, nectar-bearing sac at the base of the corolla; an epigynous, feather pappus; and a one-chambered ovary (Hobbs, 1993). “Because of their compound leaves and umbel-like flower clusters they are often mistaken for *Apiaceae* but actually they are more closely related to *Asteraceae*” (Weber and Whittmann, 1996, p. 346).

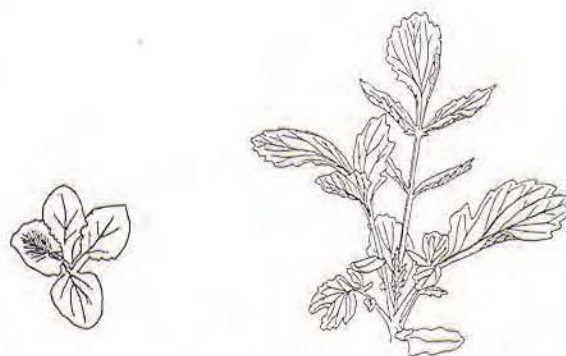


Figure 2.1. *Valeriana officinalis* – Left, seedling at three weeks; right, at six weeks

FIRST IMPRESSION:

Valerian feels protective and intense, a paradox of orderliness and straightforwardness, rising out of a deep-green jungle of leaves. Tight pinkish-white buds waiting to open. A feeling of proper uprightness and earthy grace.

EARTH

Two succulent round green cotyledons grow from the tiny valerian seed. Secondary leaves are darker green with depressed branching veins, raised on the underside. The first true leaves are rounded, entire, with undulate indentations (fig. 2.1). Older leaves are more deeply incised, forming odd-pinnate leaves with six to eight pairs of leaflets. The valerian stems grow vertically up to five feet

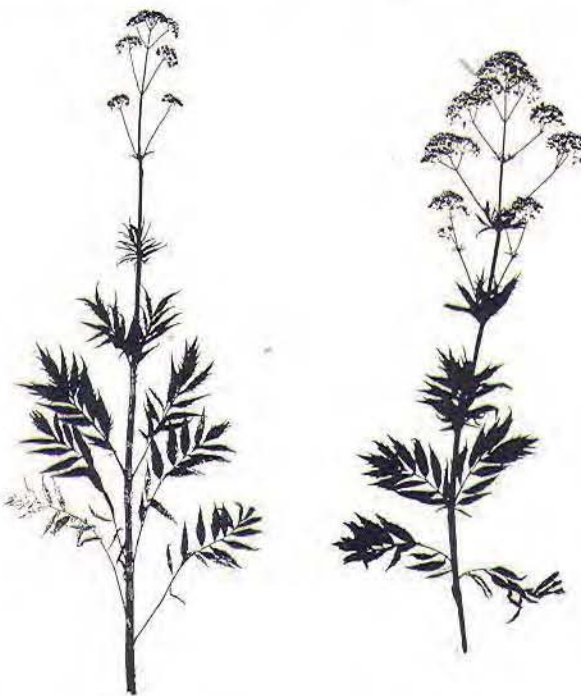


Figure 2.2. *Valeriana officinalis* – Pressed plants



Figure 2.3. *Valeriana officinalis* – Leaf metamorphic sequence, oldest to youngest, left to right

in height (fig. 2.2). Several of these stems were growing from each of the plants I observed, which were in their second year of flowering. The stem is hollow, except at the nodes, grooved and lighter green than the leaves. Leaflets are narrow and sharply serrated, with attenuate (pointed) apices and bases. Stems are covered in fuzzy white hairs toward the upper parts of the plant, especially at leaf nodes. The leaflets toward the tip of the leaf are not



Figure 2.4. *Valeriana officinalis* – Metamorphic sequence showing leaf to flower transition

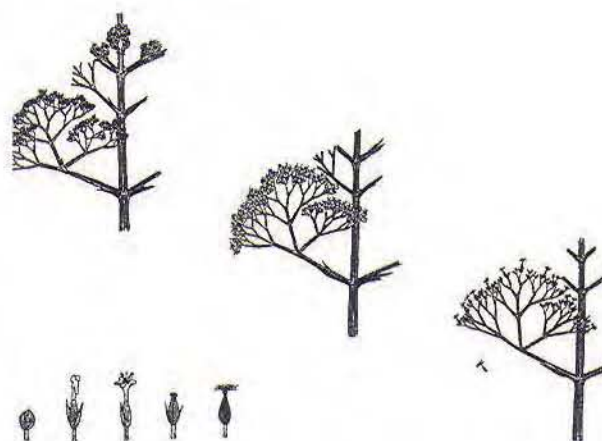


Figure 2.6. *Valeriana officinalis* – Metamorphic sequence from bud to seed showing branching and enlarged bud to seed.

always completely differentiated, remaining fused at the base (fig. 2.3). Leaf arrangement is opposite, as is the branching of the stems and the cymose flower clusters, which continue to divide in this way several times before flowering (fig. 2.4 and fig. 2.6).

The entire plant, and most intensely the flowers, gives off an immediately noticeable, almost suffocating sweet, yet pungent, smell. Thick and heavy in the air, the senses of taste and smell are not completely distinguishable. Epigynous flowers consist of a fused calyx, fused corolla (white or light pink and five-parted), and three stamens with yellow anthers growing out of the floral tube which is adanate (fused or attached from the beginning of development) with a unicarpal, inferior ovary. The stigma is tri-partite and does not extend above the corolla like the stamens (fig. 2.6).

The green fruit is an elongated pear-shaped achene, covered with tiny hairs. The brown rigid seed is tipped with a radially symmetrical pappus-like feathery plume.

Rhizominous roots are vertical and short, with flexible and white-fleshed side roots and have a smell similar to, but less sweet than, that of the flower; they only lack the sweetness. The taste is not as strong as the smell; it is sweeter, and creates a numbing sensation in the mouth. Several main root branches grow in an arch downward into the ground, with a dense network of other smaller roots filling in this central cluster (Böckemuhl, 1981).

WATER

Like dandelion, valerian is also an ideal representative of Goethe's archetypal metamorphosis in plants. The plant usually remains in a vegetative state of expansion for the first growing season. The following season, a stem rises vertically on which leaf transformation is visible (fig. 2.3

and fig. 2.4). The leaves shorten while the individual leaflets spread and become more sharply incised. The contraction stage becomes readily apparent as leaf size diminishes and leaflets are concentrated on a shorter stem. Leaves continue to contract and differentiate as one follows the plant up the stem. Flower stems rise from the axillary buds in an expansive movement. Buds, which were tightly enclosed in the tiny green bracts, open into pinkish-white blooms. Within the flower, a tiny achene is formed and released into the air, carried by its pappus-like umbrella. Looking at the leaf and flower sequence, the final contraction phase of valerian can be visualized as the flower stems shorten toward the apex of the plant, ultimately dissolving into the air, contracting into the seed (fig. 2.4 and fig. 2.6).

AIR

Balanced, angled, upward extension – valerian is like a living ladder showing three-stage evolution between soil and sky, from seed to seed. The delicacy of the flowers above is clouded by their dulling scent, which seems to send us back down to the jungly leaves below.

Valerian in flower stands fine,
with ice-capped, snowy clouds floating
over jungle-green earth bodies,
like the earth micro-cosmed from equator to pole.
A balance of anticipated movement from leaf to flower,
uniform idea unfolding.
Dense and toothed, green leaves and stem give rise to bloom
powdery white waif of submerged perfume (fig. 2.7).

FIRE

As a fine dance of polarity –
from darkness below to light above –
valerian perfumes over the garden
thick clouds of incense (fig. 2.8).

Stinging Nettle (*Urtica dioica*)

Stinging nettle is in the *Urticaceae* family, tribe *Urticeae*. The family includes ninety-eight genera and 2,475 species of annual and perennial herbs, shrubs, and trees found primarily in tropical and subtropical regions of the world (Zomlefer, 1994). *Urtica dioica* is one of the few species found in cooler temperate regions, being native to Eurasia and having spread with human habitation. It is a common weed thriving on nitrogen-rich soils of cultivated lands (Bown, 1995). Characteristics of the family include milky to watery sap, reduced imperfect flowers in modified cymose inflorescences, reduced or absent perianth,

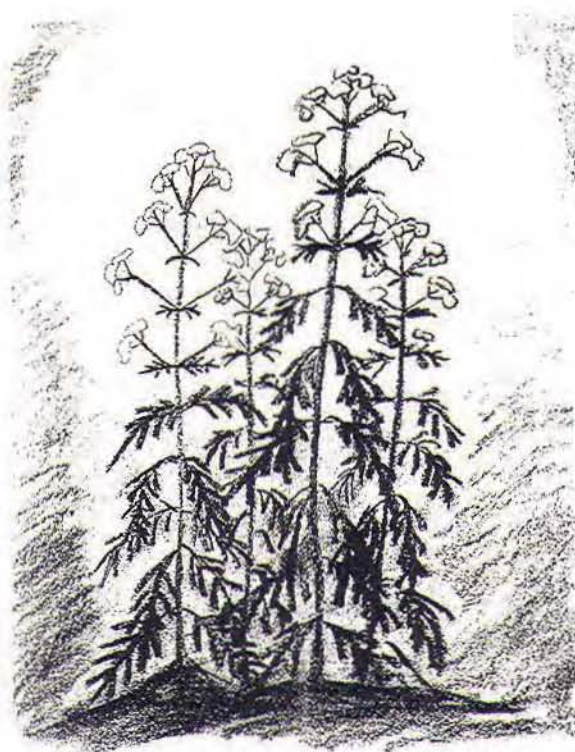


Figure 2.7. *Valeriana officinalis* – Gesture sketch



Figure 2.8. *Valeriana officinalis* – Image of plant as “theory”

uni-locular gynoecium with solitary ovule, fruit type either achene or multi-fruit drupe, and often calcification or silicification of certain cell walls (epidermal hairs and tissues of leaves) (Zomlefer, 1994). The stinging nettle tribe, *Urticeae*, is characterized by stinging hairs embedded in epidermal cells that, when broken, have a special “hypodermic needle” mechanism for releasing their irritating contents (histamines and acetocholines) (Zomlefer, 1994, p. 104).

FIRST IMPRESSION

Clustered stands of green, with garlands of flowers so tiny, simple, and many. This plant known by touch before sight as the sting burns with immediacy and warning. Four is the number of nettle, pointing both upwards and downwards.

EARTH

The nettle patches I observed were located along a fencerow beneath a tree, and alongside the “bull barn,” a storage shed near a water faucet used daily for hand washing. Due to the severe drought Pennsylvania experienced this summer (1999), the nettles under the tree dried up

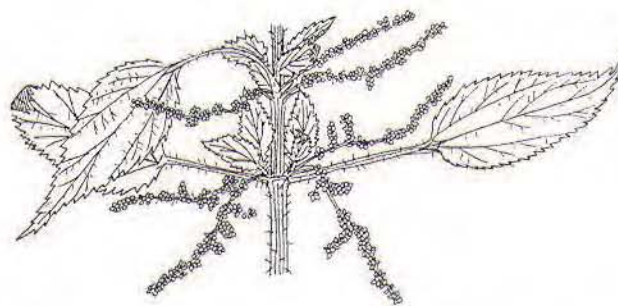


Figure 3.5. *Urtica dioica* – Leaves and cymose flower clusters, fruiting

early; those at the shed survived mainly due to their proximity to the water faucet and roof run-off.

The most immediate and direct sensory experience of the stinging nettle is through touch. In fact, Culpeper writes that stinging nettles, “need no description; they may be found by feeling, in the darkest night” (1653, cited in Bown, 1995, p. 217). The lingering sting is burning and stimulating, causing pulsation, tingling, and sometimes itching, comparable to that of an insect.

All of the stinging nettle plants I observed were growing in bunches of several individual unbranching stems with very regular opposite leaf arrangement. The cordate leaves are elongated and entirely serrate, and are covered with tiny siliceous epidermal hairs (fig. 3.4, and fig. 3.5). Leaves tend to droop in a downward arch and are folded along the midrib. Veins are netted and branching, prominent on the underside of the leaves (fig. 3.5). Leaves taste very earthy, concentrated with minerals.

The stem of the nettle is square, rigid and fibrous, also covered with tiny hairs and lighter green in color than the deep green leaves.

Flowers are very tiny and indelible, arranged in bunched clusters on cymose inflorescences, which hang in whorls around the node, arising from the axillary buds (fig. 3.5). Plants can be either monoecious or dioecious, with both male and female flowers apetalous with four-segmented perianths. Pistillate flowers are yellowish-green

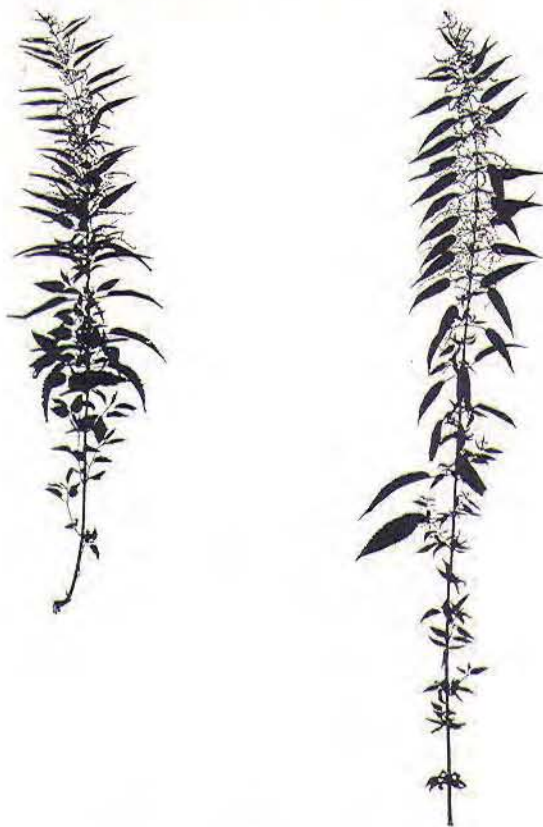


Figure 3.4. *Urtica dioica* – Pressed plants

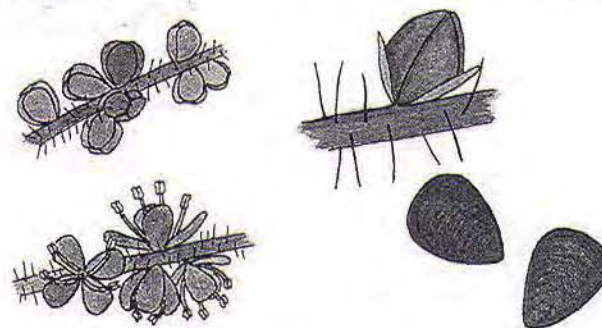


Figure 3.6. *Urtica dioica* – Upper left, staminate buds; lower left, staminate flowers; upper right, fruit; lower right, seeds

and uni-carpel; staminate flowers include a four-parted perianth with four white filaments topped by bi-partite anthers (fig. 3.6). Plants are apparently wind pollinated.

Fruits are persistent calyxes (closed perianth) uni-carpel and green. Seeds (achenes) are brown and smooth (fig. 3.6).

Roots are fibrous. Plants often spread vegetatively from the roots creating the clustered-habit of the nettle patch.

WATER

The nettle does not go through a very visible transformation. Leaves become larger and more elongated with age and as one travels up the stem, but the general form remains constant from early on (fig. 3.4 and fig. 3.7). Size again decreases as one reaches the apex of the plant, where the newest leaves and flower clusters arise. Nettle is very regular and predictable in its growth pattern. Male and female flowers undergo transformation as they develop from enclosed buds to open flowers, and then closing again, but the stages are very difficult to observe. Flowers mature along the stem from the ground up, with the meristem at the tip of the plant. It is as if the stinging nettle disappears into its youth as one reaches the tip, almost disappearing into potentiality. With the stinging nettle, I was tempted to skip the water stage and go directly into the air stage, where the gesture is most clearly expressed.

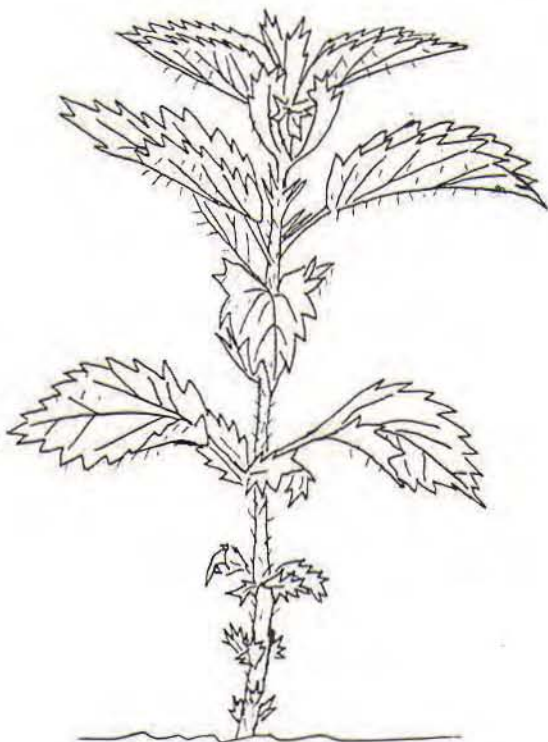


figure 3.7. *Urtica dioica* – Seedling

AIR

Established earthy elegance,
how you stimulate with needles of immediate recognition.

A ladder of potentiality reaching skyward,
embodied in regularity, garlands of flowers,
and stinging self-protection (fig. 3.8).

Some little secret,
you hold
down this place
between soil
far below
and the sky – your parade.
Poised and distinguished,
at home near humble old buildings,
project remnants, seasonal debris;
we remember you well – if not fondly –
how you rise from the cracks
between old boards and rusty spigots
fierce yet quiet – like a cat – stray and self-satisfied.
Touched, you jump into our world,
holding firm the ground,
and into the air
your angled
leaves.

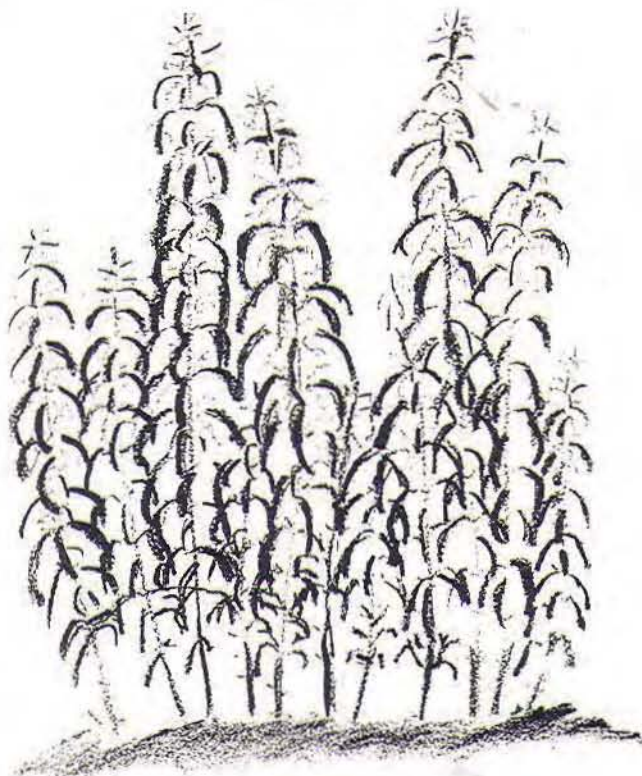


Figure 3.8. *Urtica dioica* – Gesture sketch

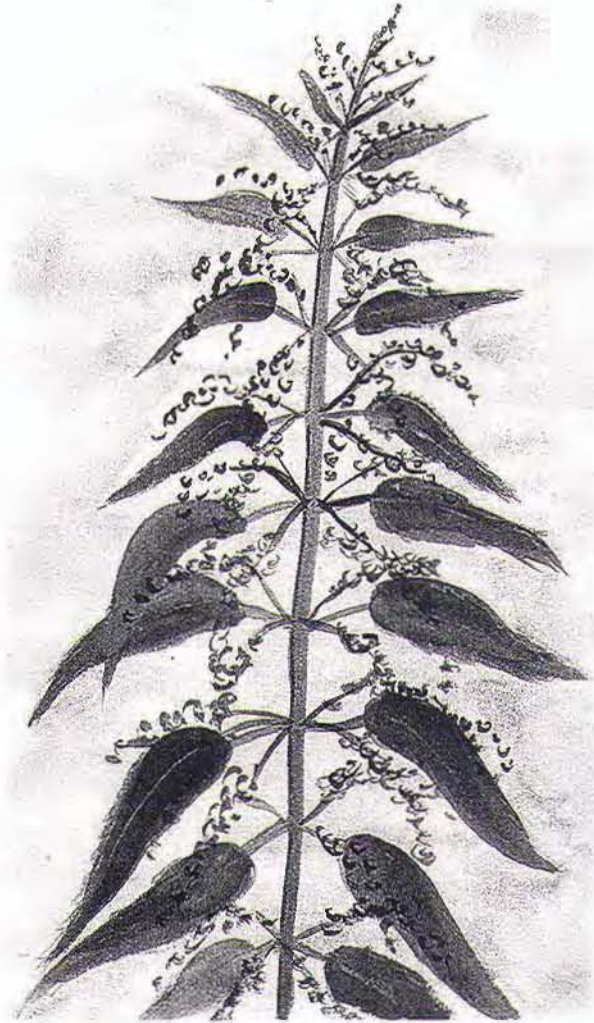


Figure 3.9. *Urtica dioica* – Image of plant as “theory”

FIRE

In regular and refined form,
the garden releases a stinging force
of stimulation and protection (fig. 3.9).

References

For a complete list of the references cited in this article,
please contact the Managing Editor at the address given
on the contents page.

The author is a recent graduate of Prescott College, in Prescott, Arizona. During the 1999 growing season, she worked as an intern at the Kimberton CSA in Pennsylvania. She now resides in Nelson County, Virginia, where she works as a caretaker for a small farm.

Goethean Science: A Phenomenological Study Of Plant Metamorphosis – Part 3

Applying the Goethean Methodology to Three Preparation Plants

The following is the final segment of three taken from a thesis written as part of the author's work at Prescott College toward a degree in Environmental Studies, with an emphasis in Agroecology. The first two parts of the piece, focusing on the use of dandelion, valerian, and stinging nettle in the making of the preparations, appeared in issues Number 230 and 231 of this journal.

Stinging Nettle, Dandelion, and Valerian in the Biodynamic Preparations

Stinging nettle, dandelion and valerian were chosen out of deep insight as preparation plants. Steiner first indicated these plants in 1924 in his Agriculture Course, where he describes their unique qualities and how the preparations should be made. The following discussion comes from Steiner and others who have researched and worked with the preparations.

Stinging Nettle

There is one plant whose beneficial influence on the manure is such that it would be next to impossible to find a substitute for it . . . stinging nettle is in fact the greatest benefactor of plant growth, and it can hardly be replaced by any other plant . . . Stinging nettle is a real jack-of-all-trades; it can do many different things. It too contains sulfur, which, as I have already explained, plays an important role in assimilating and incorporating the spiritual. Stinging nettle also carries the radiations and currents of potash and calcium, but in addition, it has a kind of iron radiation that is nearly as beneficial for the whole course of nature as the iron radiations in our blood are for us. It should actually be growing all around our hearts, since the role it plays in nature by virtue of its marvelous inner structure and way of working is very similar to that of the heart in the human organism. (Steiner, 1993, pp. 98–9)

The stinging nettle preparation is made by burying the entire plants in the ground in the fall and leaving them there for a full year. (Steiner, 1993) Unlike with the other preparation plants, the entire plant, not just the flower, is used. "The stinging nettle has a very insignificant flower

which is quite hidden in the foliage of the upper part, but the whole plant can be perceived as being a flower." (Klett, 1996, p. 51) The nettle preparation is also unique in that it does not require an animal sheath. It provides its own sheath of silica hairs from which this intense burning quality is released upon touch. (Klett, 1996, pp. 58, 78) "It has the capacity through this outer silica coat to perceive what is working in the earth during summer and winter-time while it is buried there. It provides its own sheath to perceive and preserve what is concentrated in its 'inner organization'." (Klett, 1996, p. 78)

When you add this to your manure the effect will be to make the manure inwardly sensitive and receptive, so that it acts as if it were intelligent and does not allow decomposition to take place in the wrong way or let nitrogen escape . . . it also makes the soil more intelligent, so that it individualizes itself and conforms to the particular plants that you grow in it. Adding *Urtica dioica* in this form is really like an infusion of intelligence for the soil. (Steiner, 1993, pp. 99–100)

The stinging nettle preparation, along with the yarrow and the chamomile preparations, are used to "enliven the solid earthly itself." (Klett, 1996, p. 50) They generate "nous," a new living nitrogen in the soil. Nitrogen relates to the forces of inwardness, and therefore this "nous" can be compared to intelligence or self-consciousness of the soil. (Steiner, 1993, p. 99) Bockemühl sums up the nettle preparation by saying, "The stinging nettle can help to prepare the ground in such a way that the plant can select what it needs." (1981, p. 77) It works especially with calcium, potassium, and iron.

Dandelion

The innocent, yellow dandelion is a tremendous asset because it mediates between the fine homeopathic distribution of silicic acid in the cosmos, and the silicic acid that is actually used over the whole region. The dandelion is really a kind of messenger from heaven. (Steiner, 1993, p. 103)

The dandelion preparation is made by taking the mature flowers, packing them into a bovine mesentery, and bury-

ing them in the ground through the winter. (Steiner, 1993) The dandelion preparation, added to the manure, . . . will give the soil the ability to attract just as much silicic acid from the atmosphere and from the cosmos as is needed by the plants. In this way the plants will become sensitive to everything at work in their environment and then be able themselves to draw in whatever else they need. (Steiner, 1993, pp. 103-4)

Dandelion is the mediator of forces from above and not from below. It has the capacity to relate cosmic substance, silica, to earthly substance, potassium. (Klett, 1996)

Valerian:

The valerian preparation is made by pressing the flowers for their juice. This juice is diluted and sprayed over the compost pile in which the other preparations have been placed. (Steiner, 1993) "If this diluted valerian juice is applied to the manure in a very fine manner, it will stimulate the manure to relate in the right way to the substance we call phosphorus." (Steiner, 1993, p. 104)

Valerian is not like the stinging nettle, which has the unique capacity to envelop itself. Valerian is enveloped by the cosmic circumference. It forms a sheath of warmth wherever we spray it . . . it surrounds the plant life with a warmth mantle. (Klett, 1996, pp. 54-5)

It opens towards the spiritual, protects against influences of the natural environment and preserves the workings of its brother and sister preparations when we spray it over the compost heap. (Klett, 1996, p. 81)

Conclusion

Whoever considers the meaning of natural science in human life will find that the meaning cannot be exhausted by the acquisition of knowledge. . . The soul does not live in what man can know of nature, but in the process of knowledge. The soul experiences itself in its activity towards nature. (Steiner, cited in Bockemühl, 1981, p. 11).

Goethe was able to see the inherent connectedness of the natural world. His theory of metamorphosis grew out of his disciplined ability to see the archetypal laws of nature expressed in every form. I undertook this project to explore and develop in myself this holistic way of seeing that grows out of the experience of phenomena. By choosing to study metamorphosis in plants, I was able to research them as whole beings in their living environment. Phenomenologically, I attempted to understand the nature of the species by observing metamorphosis in

individuals. My sense for the essence of each plant grew out of my experiences, as I intended to see how Goethe's archetypal plant was expressed in each.

I chose to refrain from reading and researching the uses or qualities of dandelion, valerian, and stinging nettle during my personal research, although these activities may have provided more information. This limitation provided structure for the self-reflection and discipline I needed so that I could use myself as an instrument to "test" the Goethean method. I wanted to explore these plants in a way that did not result in an accumulated "knowing" of them, but in their essence or wholeness.

During my research into dandelion, valerian, and stinging nettle, I remained with the plants, observing them over time, in various circumstances. Through my observations, I tried to allow the plants to express themselves to me, and sought to develop finer observational and cognitive skills. I sought the unity of each species by exploring the forms of the various parts of the plant, the relationships between the parts, and the overall meaning as it is expressed through growth patterns and gestures. I found my experience was a relationship between myself and what I observed. This reciprocal relationship grows out of my "intending" activity as an observer, whereby observation is not passive or objective, but participatory and therefore theory-laden. (Bortoft, 1996) By remaining with the phenomenon throughout my research, instead of replacing it with an intangible concept, I worked to avoid abstract subjectivity. Through this process I was able to begin to see Goethe's archetypal plant in dandelion, valerian, and stinging nettle. With this ability I may begin to see this archetypal law in all plants as well as how each member of the plant kingdom is diverse in its expression of the threefold nature of metamorphosis.

This way of seeing could greatly benefit the more pragmatic and materialistic approaches of botanical study. It helps make visible the relationships between various species within and between genera and families. For example, the family *Valerianaceae* is taxonomically very closely related to the family *Asteraceae*. One can see this relatedness in how *Valeriana officinalis* and *Taraxacum officinale* undergo similar patterns of metamorphosis, and in the morphological similarities of their flowers, fruits, and seeds. One can imagine the cymose flower clusters of valerian further contracting into a single inflorescence of many flowers, as in dandelion and other composites. Fruit and seed formation are similar, as is the dispersal mechanism (valerian has a feathery pappus-like fruit much like that of dandelion). Both species undergo a clearly visible expression of the three stages of expansion, not only in

their organ transformations, but also in how the overall morphology of the plants change throughout their life cycles.

One can also see how the two plants are unique in their expression of the same inherent law of metamorphosis: valerian's pungent smell and upright nature, dandelion's basal growth pattern and leafless flower stems, to name a few. With a phenomenological approach, one can experience the meaning underlying plant taxonomy, coming to see relatedness within the diversity of plants.

Regarding the indications of these plants for use in the biodynamic preparations, I feel there are some congruencies between my experiences and the qualities Steiner discusses. The thick, stupefying scent of valerian is dulling to the mental and sensory activity of a human being. This could be associated with the protective, warming effect the valerian spray has over plants when it is applied as a fine mist. The plants are perhaps temporally "dulled" so that they are not harmed by the external environmental influences such as frost. The pulsating and burning sting of the nettle is also an irreducible experience. Here the stimulating effect of this plant can be felt immediately through touch, and therefore the correlation to its workings in the "farm organism" (circulation, working with iron) make intuitive sense. The potent yellow color of the dandelion flower led me to associate it with the sun, or "cosmic" qualities, and the feelings of strength and welcoming.

The goal of this project was not to support or refute Steiner's insights, but to enter into a deeper relationship with the natural world through practicing the Goethean way of seeing. I feel that this method is an appropriate first step in developing a fuller understanding of why these plants were chosen for the biodynamic preparations, and in exploring the possibility of replacing them with bio-regionally appropriate species. One can begin to see plants as inherently connected to, and as unique expressions of, a landscape. Through this reflective relationship, and with disciplined and refined perception, one could progress from a plant's functions in the landscape to how it might function as a preparation in the farm organism. To do this one needs to include the workings and expressions of the cosmic influences in one's observations. I believe that working with the Goethean method could help engender one's ability to "see" these qualities. More extensive research into this area is thus greatly encouraged.

I developed a deep appreciation for these plants because I went beyond the analytical mode of observing and thinking, and opened myself to experiencing them as unique dynamic beings, inherently related, yet distinct in

expression. The Goethean methodology challenges us to embrace this deeper wholeness of a phenomenon, to see it in relation to the rest of the natural world, and to ourselves. This intimacy and ability to "see" wholeness, the inner organization, becomes especially vital in working harmoniously with landscape, as in agriculture. Through an understanding of wholeness we may deepen our reverence for the natural world and be moved to bring this respect into all of the realms of our lives.

References

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