

Plant Observation

Enhancing Our Capacities to Perceive and Understand

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In adult education programs at The Nature Institute, which we have been offering since 2002, a central emphasis is learning through direct experience. In many courses and workshops, a focus has been the study of plants and through it the development of phenomenological practices. In 2022, I was asked by the *Biodynamic Federation – Demeter International* to contribute to a manual that would include observational practices. What follows is a lightly edited version of what I submitted. I have brought together and described many exercises. Some of the descriptions are drawn from publications in which I placed these kinds of exercises in larger contexts (see “Further Resources and References” at the conclusion of the article). In the order that I present them here, the exercises build on and augment each other in a meaningful way. That said, the sequence is not meant as “first you must do this before you do that.” All the exercises can be varied and expanded.

1. Plant Observation in a Group — Into the Phenomena

Going outside, I ask everyone to look at a particular species of plant. I have selected the plant beforehand: It is a wildflower that is flowering and can be easily found in fields or along roadside edges. We walk around and see where it is growing. I ask everyone to take a few minutes, look at the plant and its surroundings, and then pick one specimen. If there are many specimens, we may dig out the plant with some of its roots. We then sit in a circle (inside or outside), each person with his or her plant. I give some guidelines for our observational process: We will go around the circle and each person will describe an observation of the plant. I request that descriptions be kept fairly brief so that everyone gets a chance to share observations with the others. I ask that we try not to repeat what others have said, a suggestion that encourages mutual listening. I also request that those participants who may know botanical terms use them only if everyone else can follow the description. We are not focusing on our personal responses to the plant but want to bring out characteristics of the plant that we can



perceive. Finally, I say that we are not concerned here with explanations, causes, or models. We are not asking “why” questions; we simply want to take in and describe what the plant has to offer.

We describe, moving from the bottom to the top of the plant. I will not try to reconstruct the whole process, but just give a few examples: A person is looking at the lower part of the stem and describes the clear transition between the whitish root and the upright stem, which at its base is purplish and then turns green. Someone else describes the stoutness of the stem and the fine hairs that are mainly present along its vertical ridges. Another person describes the oval shape of the lower leaves with their smooth margin, and notes the veins, especially visible on the leaf’s underside. You can imagine that with such detailed observations and descriptions, we are carefully attending to what can be seen, felt, and smelled on the plant. We might go around the circle two or three times until we have a sense that we’ve attended to the different features of the plant. Such a process may take an hour if not more.

Although deceptively simple, this process yields many fruits. First, and perhaps foremost, it is a cathartic practice to step out of everyday habits and to simply give one’s full attention and time to something one would normally, at best, take in only with a glance. It helps us realize that we almost never look at things in a careful and detailed way. How often we gloss over things! Moreover, we are impressed by the plant in all its detail, pattern, and variability. In one course at The Nature Institute, we studied common



milkweed and a participant remarked: “I always look at milkweed differently now. I had the profound experience that, even as a total

novice in the life sciences, I could, through attentiveness to the natural world around me, come to know it better.” This can happen with the most inconspicuous wildflower. By looking carefully we take the plant seriously — we turn our unencumbered attention toward it. We see the plant as a being in its own right and learn to value it for its own sake. One person expressed it this way: “I will never walk past a daisy the same way!”

If we were to look at the plant from too narrow a perspective, this realization might well not occur. If we were interested only in, say, what medicinal properties a plant has, we could get a quick answer from an expert or book. But we are not carrying out a question-and-answer session with the plant. Instead, we are taking the time to perceive, to dwell with the plant and its features.

In this exercise we also notice that there is no natural end to observing. There is — even if we don’t dissect, use hand lenses, microscopes, or do biochemical analyses — always something more to see, smell, or touch. In this sense, the perceptual world has an endless richness of detail and pattern to disclose. It’s only we who choose to stop perceiving at some point. For most people this discovery is a kind of “aha” experience. We get a glimpse of what philosopher Merleau-Ponty once called the “hidden and inexhaustible richness” of the sense world (1969, p.139).

Something else is remarkable in the process of group observation. We notice how differently people perceive and describe. Everyone in the circle realizes that, alone, he or she would not have seen nearly as much. Our senses are opened and directed in new ways by what others perceive and describe. Some people have an ability to see more of a detail that others don’t attend to, like one participant who never left the root, even after everyone else was focusing on the flowers and fruits. Or the person who noticed the different shades of green, or how the plant felt when she waved it back and forth as if in the wind. The plant reveals more and more of itself as different people make different discoveries. Knowledge arises in a community. Through such a process a learning community develops, and, in Goethe’s words, “The interest

of many focused on a single point can produce excellent results” (1995, p. 12). The unique perspective each person takes truly enriches the whole.

What allows different perspectives to show their best sides is the fact that everyone’s attention is on a phenomenon about which people don’t have a great deal of pre-knowledge (prejudices and assumptions). They can look in quite an open way. Even people who have studied botany have rarely looked at one plant for so long and in such detail. Also, it’s not about what we know from memory or our book learning, but about what we perceive *right now*.

Different people can have different perceptions, but these differences do not create separation; they enhance one another. We learn to appreciate the different ways people observe and describe.

There may at times be need for clarification and more precise or accurate formulation, but that can all be achieved through recurring attentiveness to the thing itself and through mutual effort to find ways to adequately express what we’ve perceived. The plant is a natural corrective for flights of fantasy or mere opinions. All we need to say is, “Look again.”



2. Simple Drawing Exercises

Drawing can help facilitate looking. As John Ruskin noted in his classic *The Elements of Drawing*, “We always suppose that we *see* what we only know” (1971, p. 28). We all “know” that a blade of grass is green. We may even believe we see it as green when, in fact — if we put aside our preconception and actually look — the blade of grass is yellow in the particular light conditions in which we are observing it. Anyone who looks closely observes that color is dependent on the illumination. We have to look; we can’t *know* the color beforehand. Similarly, we may know that the form of a building is rectangular, but when we attend to what we see, from the particular standpoint we have, we notice that if we draw a rectangle for the face of the building, we are drawing something that looks

completely wrong. So drawing can lead us out of our mental preconceptions and into the appearing phenomena themselves.

Ruskin spoke of regaining a childlike “innocence of the eye” (p. 27) that can open our perceptions and give us the



possibility to draw what we see: “For I am nearly convinced that, when once we see keenly enough, there is very little difficulty in drawing what we see.... I believe that the sight is a more important thing than the drawing; and I would rather teach drawing that my pupils may learn to love Nature, than teach the looking at Nature that they may learn to draw” (p. 13). Drawing in this sense is a schooling of seeing — a way of opening up our looking and orienting it around the fine nuances of form, shadow, and color. One course participant remarked: “Of most value was the increasing ability to see and to see how little I see. I feel that my eyes have been newly enlivened, and I want to keep drawing.”

In some courses we started by drawing a white-colored ball on a cloth; the ball was illuminated from one side so that it threw a shadow onto the cloth. This setup provides a wide spectrum of light and dark shades and the “simple” elegance of the sphere. We draw in such a way that we do not make outlines — a line as a boundary is the creation of the intellect; what one actually sees are shades of light and dark. In trying to put these shades on paper, we notice how the object emerges out of the interplay of light and dark and how its bodily, three-dimensional aspect becomes all the more “visible” on paper the more we can do justice to the seen patches of brightness and darkness and the transitions between them.

On the basis of such an exercise, we turn to an organic form, such as the leaf from a tree. We sketch it first by filling

out the form from the inside out. Again, no outlines but shading from the center and moving toward the edges. It’s not so important that every detail is “right,” but that the form emerges centrifugally. Then we do the exact opposite: we start by shading the outside — the space around the leaf — and move in toward the leaf margin. In this way we draw the space around the leaf, and the leaf emerges as the “empty” space in the middle. This trains our observation to attend to a form in relation to its surrounding. Drawing the leaf from the inside out is much easier and comes more naturally — natural for our object relation to the world. It is more difficult to take the space around the leaf to be “real,” draw it, and let the leaf emerge in this way.

The process of drawing presents challenges, because we often struggle with our own limits in technical facility, but if that concern can be overcome, we make discoveries. In the words of a course participant:



“The drawing started out very difficult for me. I wanted to do it and be done. I was surprised as I sat with my drawing and ‘what’ I was drawing, that I really could take the phenomenon in and express it on the paper by going into it. It helped to bring up and demonstrate the going in and going out. Working in one color only also was amazing in helping me feel subtle gradations rather than discrete ‘things.’”

Through drawing we are, literally, drawn into the phenomena.

3. Sauntering of the Senses

Another kind of exercise complements the focused attention to detail in observation and drawing. We let our attention spread out and wait to find what comes toward us. Here we don’t predetermine what we attend to but, in a sense, invite the world to speak. Henry David Thoreau describes the intention:

I must walk more with free senses — It is as bad to study stars & clouds as flowers & stones — I must let my senses wander as my thoughts — my eyes see without looking.... Be not preoccupied with looking. Go not to the object, let it come to you.... What I need is not to look at all — but a true sauntering of the eye. (Journal entry; September 13, 1852)

Going for an unstructured walk is not easy. We strive



to enter a mode of open expansive attentiveness. We are not focusing, but we are expectant: What might come toward me? Or asked differently: How can I be wakefully “out there” so that things catch my attention? If something catches my attention — the way a leaf is oscillating in the wind; the bird that lands on a nearby limb; the sparkling dew drops on the vegetables; the way two cows are interacting — then I can dwell for a time and take in the scene. At some point I continue to saunter.

It is much easier to describe a plant in detail than it is to go sauntering with open senses. In the latter case we must willfully try to open our attentiveness and invite the world in — we have little control, and that is both unsettling and cathartic.

One exercise that helps bridge the gap between controlled focus and the ability to saunter with the senses is to choose a broad sensory focus for attention. For example: We go for a walk and decide to focus our attention on color. Or we focus on scent, or on sound. This focus by no means determines what we see, smell, or hear, but by narrowing our attentiveness to a sensory modality we are more receptive to that realm of experience.

One day I was walking in a forest and wetland preserve with the intent of paying attention to light in the forest. I began noticing what I otherwise took for granted and had not really seen at all: the dark areas, the spots that were very bright, the more diffuse columns of “sunbeams.” It was windy that day, so there was an ongoing play of changing illumination. At one moment a spot lit up brightly, changed form, and disappeared. I was strongly struck by this appearance. I don’t know why, and I cannot describe it any further. But it was a deep experience and one that I can remember back to, although that memory is by no means the same thing as the one-time, striking experience itself.

So far, I have described two complementary types of sensory observation exercises. In the one case — the example

of the plant observation — we go out with our attention to meet something particular and take it in with all its details. We move with our senses and attention in and through the phenomena. In the other case, we try to create a kind of open receptivity that allows us to take in what appears at a given moment.

Every perception of a thing or situation has these two aspects — focus and receptivity. Without these there would be no perception. By carrying out such exercises in both directions, we are honing our capacities to perceive the world around us. In this way we can shift

into a sensory mode, being with the things themselves. The two kinds of exercises enhance one another.

4. Exact Sensorial Imagination

When we have made the effort to perceive carefully, this interaction leaves an impression on us. New features of the world have become part of us. We can remember, at least to some degree, what we have seen, smelled, touched, or heard. So after we have carried out a variety of observation exercises, I request that participants in courses willfully re-picture or re-create in their imagination what they have perceived. Picture the color of the stem and how it changes from bottom to top; feel the consistency of the stem by imagining the feeling of the pressure you applied to it with your fingers; reawaken the fragrance of the blossom and dwell in it for a moment. In this way we can build up a vivid picture of the plant we have observed or of the meadow we have walked through. By doing so we awaken in ourselves what we have met through sensory engagement. We can actually remember much more than we realize, and, moreover, sometimes the hue of green or the shape of a leaf will speak more strongly in our inner picturing than it had in the moment of observing.

During a course, I ask participants to make re-picturing a daily practice: picture in the evening or morning the plant or environment with which we have been concerning ourselves. We talk about the experience of picturing, and people share their questions and approaches. It is fascinating how differently people picture. Often people notice that they couldn’t picture something because they hadn’t really looked at it.

What is the significance of inner re-picturing, which Goethe called “exact sensorial imagination”? First, it is a practice that allows us to connect ourselves consciously and vividly with what we have experienced. We bring to awareness what would otherwise sink into a sea of potential

memories. We willfully call up these experiences and enter into them with our picturing activity. This activity is imbued with feeling: not reactive feeling but feeling as a connecting agent, as an inner sensorium for qualities.

In perception we go out to things and invite them in; in exact sensorial imagination we re-create and enliven within ourselves what we have met in experience. In this way we connect deeply with the world we meet in sensory experience. One course participant described how the work in a course created “lasting experiences of the plants through the practical observation and visualization exercises — I feel I have ‘met’ two plants, as many of my perceptions still live fresh in my imagination.” We have taken the plant in and now we move it in us. Or, said differently, we come into inner movement by re-creating in imagination the qualities we have perceived. We can thereby become more aware of these qualities.

Second, this practice can help us to notice that we need to perceive more carefully if we are going to be in a position to faithfully re-create in ourselves a vivid image. This realization motivates a return to the phenomena.

Third, it is an aid to overcoming the tendency to think abstractly. In exact sensorial imagination we are using our mental capacities to get closer to the concrete sensory qualities. This contrasts starkly with an abstract frame of mind that uses concepts to explain and interpret what we perceive. Exact sensorial imagination lets our minds practice intimate dwelling instead of abstract distancing.

We can view perception exercises (1 to 3) and the practice of exact sensorial imagination as two polar practices that enhance each other. Both need to be practiced. By going out into perception and openly taking account of what the world offers we inform experience with the richness of the sensory world. Through exact sensorial imagination we connect these experiences with ourselves and at the same time become inwardly active. The world comes to life in us. We can practice a kind of pendulum swing between going out and bringing in and enlivening, going out again, bringing in and enlivening. My personal experience is that by doing this, both perception and picturing are enhanced. Through careful perception I participate in the phenomena. This gives me a wealth to re-picture. Through vivid re-picturing my attentiveness to the world is enhanced. I perceive vividly and more can be disclosed in any moment.

When we move far out into the world with our sensorial attention, we can then move far into ourselves; this allows us, in turn, to expand more into the world. “Outer” and “inner” can no longer be viewed as two distinct realms; they are two aspects of one oscillating activity. Inasmuch as we bring forth this dynamic movement, we are interfaces in which we and the world continually intersect in vibrant activity.

5. The Plant as a Being of Time and Transformation

In the first exercise, the task was to observe the plant as carefully as possible, staying with all the details. This allows us to practice exact sensorial imagination and to come into an intimate relation to concrete appearances as just described.

There is a danger in the first plant observation exercise — if that is all one does. The danger is that we have the parts but lose sight of the plant as a whole. We may lose the forest for the trees. Already doing the active re-picturing helps to avoid this. But there is more.

After doing the careful observation, in a next session it is good to ask: In what way — even when we only observe it at one point in time — does the plant show us that it lives in time,



that it goes through transformations? If you are looking at a flowering herbaceous plant (a wildflower, a flowering squash or pea plant) there are many features that lead us into time and transformation. It is good to have participants share what they can discover in small groups and then collect the observations. For example:

- Some leaves are wilted, others fully unfolded, and still others just emerging.
- The shape and size of the leaves along the main stem change in shape from bottom to top of the plant.
- In the axils of the leaves there are buds — hints of something to come.
- Some flowers are just opening, others are fully open and in some the petals are wilting.
- A few fruits (pods, etc.) are appearing.

In these and other characteristics the plant shows us that it is, at any given moment, in a state of becoming. We can see its passing (wilting), its present in manifold forms, and intimations of the future in buds and fruits (the bearers of seeds). We can see the expressions of its life activity. If we are open to it, the plant is always transporting us beyond the spatial into the temporal, into transformation, into life.



The transformative nature of a plant becomes all the more vivid of course when we observe the plant over time. It is a worthwhile experience to observe one plant during its growth and development. We never see the whole plant. We see snapshots on different days. We are seeing the tracks of its life process. The plant's life is a continuum, an ongoing unified process that mani-

fest in manifold forms and substances. We can consciously picture in our imagination, say, how the plant appeared one day and then again three days later. We let the one form morph into the other. In this way we come closer to the stream of the plant's life, to the plant as activity. It is through our exact imagination — through which we bring forth a transformation — that we get a sense of what the plant is doing day in and day out. This transformative life process is never apparent to our sensory observation. We need to become inwardly active to participate in the life processes of the plant. In Goethe's words: "If we want to behold nature in a living way, we must follow her example and become as mobile and malleable as nature herself."

6. Plasticity in a Plant Species

When we have observed a specimen of a species carefully, a next step is to observe it in different contexts. If we have attended to a common wildflower or "weed" (in the words of Emerson: a weed is "a plant whose virtues have not yet been discovered") we can go around and see how it grows along a roadside, in a ditch, at the edge of a hedgerow, in a garden, or at the edge of a compost pile. If we have observed a cultivated plant, even if the specimens are in the same garden or field, do they all look the same? How are they different when planted at different times or in a greenhouse compared to outdoors? The key is

to notice that we are seeing the same plant species, but we are beholding it in different manifestations.

The same plant species can range widely in size, in the shape of its leaves, in the extent of branching, and so forth. The image below shows different pressed specimens of wild radish (*Raphanus raphanistrum*) that were picked at the same time. They were all growing in the same area, but the microenvironments were strikingly different. As in the other exercises, we need to slow down and dwell with plants. If we only register, "Oh, they are different from each other," then we haven't really met the plant in its capacities. Here the activity of re-picturing is helpful: Picture the smallest specimen with its short main stem that hardly branches and carries few slim leaves. It was growing in "soil" that had been strongly compacted by heavy machinery the previous year. The largest plant — only 30 meters away — was growing at the edge of a meadow. Picture its effusive growth with many large leaves and strong branching that ends in a multitude of flowers. The other specimens were growing in the area in between these two plants.

Through such observations we begin to get the sense of the plant as a dynamic being. *It can be itself differently in different contexts.* The small plant is expressing in its form and substance something of the quality of the compacted dry earth it is growing in, just as the meadow plant is showing us what the richer soil means to it. We begin to see qualities of the environment *through* the plant.

Similarly, we can compare specimens of a vegetable variety growing in different parts of a field, or that have been sown at different times. Trees offer another potent opportunity to witness plasticity: How does a tree of a given species grow in an open field, at the edge of a forest, or in the middle of a forest?



7. What the Leaves of a Tree Can Teach Us: Variety and Potency

This is a wonderful exercise to do in a group. We go outside and consider one particular tree that has at least some of its leaves and branches at a height that we can observe closely. We spend some time looking at the tree as a whole: its overall form, its colors, the play of light, how its leaves and branches move (or don't) in the breeze. Then we move closer and observe one limb of the tree. How does it branch? How are the leaves and buds arranged on the twigs? As a next step — and in acknowledgement of and gratitude for the tree's abundance — each person picks just one leaf.

Then we go inside (or gather in a circle outside). Each person studies her or his leaf — exploring its characteristics with different senses. Then we close our eyes and try to re-picture that leaf. We look again, and re-picture again. As a next step, each of us passes our leaf to our neighbor on the right (or left). We consider this leaf for only a short time (maybe a minute) and then we pass it on. We do this until the leaf we started with returns to us. What an experience! The variation in the leaf size, shape, consistency, color! And we have only considered maybe 10 to 20 of the thousands of leaves on the tree. (It's also interesting how everyone becomes attached to "their" leaf.)

The photograph below shows leaves from one white oak tree (*Quercus alba*) that were pressed in the autumn, just before they would have fallen from the tree.



No two leaves are the same — we can observe as many as we like. This experience can fill us with wonder. Just imagine: Each year a deciduous tree in a temperate climate unfolds thousands of leaves, each unique and each part of the unity of the tree. And each year the leaves are new and different yet again. The tree as one organism brings forth itself (through its environment) in an unfathomable variety. We usually overlook this creativity of plant formation because

we stop with registering “this is an oak, a maple, or a birch.” We don't make the effort to look more carefully. Here the key is that we don't look at just one leaf, but at many. Similarly, we can look at many branches of a tree, or look at many specimens of one species.

After we make these kinds of observations, we need to stop and consider the implications of what we have noticed. We realize that the tree has immense potency. Or we could say: The tree as a living being is creative potency and this potency is always greater than what comes to appearance in any given case. The tree as activity brings forth itself and all its members (trunk, leaves, and branches) in remarkable plasticity. Through this way of attending to a tree, we catch a glimpse of the creative power that is everywhere present in the living world.

8. Observing Seeds and Germination

How one prepares and carries out the following observations depends on the length and schedule of a course or workshop. In a short workshop, for example, the teacher will need to have planted seeds ahead of time so that the phases of germination can be observed in different specimens. In longer courses, participants can set up the experiments and observe the processes over time.

As in the previous exercises, we want the participants in each of the “steps” that follow to observe, note characteristics, describe changes, share impressions, inwardly re-picture, and actively participate in the process-nature of the plant by letting their imaginations morph the sequential snapshots into each other.

The dry seed: We begin by observing some seeds — shape, consistency, and so forth. Large beans are easy to observe. It is worthwhile to open up a dry bean along its “seams” and then with a hand lens or low-power binocular microscope observe any structures that may be visible. The bulk of a bean consists of the two nutrient-rich cotyledons. At one end it is possible to see the tiny primary root (radicle) and toward the other end, the growing point (apical meristem) and one or two tiny leaves that will develop into the first foliage leaves of the plant.

Swelling: We take a dinner plate and put a few layers of moist paper towels on it. We place a number of seeds on the paper towels and cover with another plate. In a warm room, already the next day we can observe how the seeds have changed. How are they different? We can open up a couple of seeds and look inside (as we did with the dry beans). Has anything changed? We can use the remaining seeds for the next exercise or plant them in earth in a pot for further observation.



Germination (1): We can use different seeds for this. Bean seeds and grains (wheat, corn) work well. We can either observe just one type of seed or compare different ones. Here is one setup and procedure that allows us to observe initial shoot and root development:

1. Wet two or three paper towels then line the inside walls of a tall drinking glass or a cylindrical glass jar with the towels. (The containers should be at least 15 centimeters high so that the roots have enough space to elongate; the photo below shows such a germination jar in the lower right-hand corner.)
2. Fill the core of the glass or jar with a crumpled sheet of newspaper. The newspaper will hold the wet towels in place. Wet the newspaper and let 1 to 2 centimeters of water pool at the bottom of the glass.
3. Now “plant” the seeds between the glass wall of the jar and the wet paper towels, fairly high up in the jar. You can place up to about four seeds in each jar.
4. Place the glass jar in a fairly warm place.
5. Sketch the setup.
6. Observe every day, note the changes in a notebook, and make sketches of how the seeds change, writing down the date for each entry and sketch. Keep the towels/paper moist.

In addition to the germination jar, the photograph shows a custom-made root box for observing germination and root growth in seedlings.

When ample time is available, we can have the same setup and then vary the conditions and observe what happens. For example, we place one jar in a sunny spot and another in shady conditions. Think about what the conditions are in the environment that allow the seed to germinate.

Germination (2): We take seeds and plant them in soil in pots or outside in beds. As above, we observe regularly and describe changes. There are many ways to vary and compare different conditions to observe the plant-environment relation: different soils, light conditions, watering, and so forth.

9. Does a Plant Grow out of a Seed? — A Contemplation

After carefully observing plant phenomena and working to bring the forms, processes, and relations to life in us, we can engage in a further kind of activity that builds on these experiences. We want to thoughtfully consider our experiences to gain deeper insights. Such contemplation based on careful observation is a capacity to enhance. This is not merely intellectually thinking *about* the seed as onlookers. We want the work we have done in the above exercises to lead into a mode of concretely thinking *with* the phenomena. We want to school pictorial thinking that is rooted in the vividness of sensory experience. In this way we can encounter riddles and gain insights that are not accessible to abstract thought.

Here I bring one example: What deeper meanings and relations can the seed and germination reveal? In what follows I will also incorporate knowledge gained from other experiences and from the scientific literature that can help shed light on the phenomena.

A simple question can stimulate a contemplative inquiry: Does a plant grow out of the seed? The answer seems obvious. But is it?

There is perhaps no process in the life of the plant that can evoke more wonder than seed germination. The seed is the most compact, condensed, and driest form that a plant creates. It contains, in germinal form, a whole plant surrounded by tissue from the mother plant. When released from the mother plant it becomes an independent entity. It can remain dormant — depending on the species — for a long time. This in itself is a riddle: the seed hardly seems alive — no growth and minimal metabolic activity that only





refined laboratory investigations can discern. Yet it harbors the potential for abundant life.

Only when the seed encounters particular conditions will it germinate. Some seeds need to go through the cold of winter or the heat of a wildfire to be ready to germinate. Most of the seeds we plant in a flower or vegetable garden need the warm moist soil to germinate. Then we can witness in a few days the beginnings of plant development. The germinal primary root (radicle), the cotyledons, and the growing point of the shoot (apical meristem) have formed while the seed was developing. What consequently emerges as root and shoot (or hypocotyl) through the seed coat as it breaks open, was not previously there. These are new formations; the plant is growing. There is the aspect of unfolding (especially apparent in the cotyledons), but it is not like unfolding a piece of paper, because growth is occurring at the same time. The shoot elongates, the leaves turn green (formation of chlorophyll). The plant is continually creating new substances and structures.

So where does the new substance of the plant come from? Without what was in the seed there would be no growth and new development. New life builds on already existing life. For a time, new substance may be formed through transformation of the substances (fats, proteins, starch) that the seed has stored. These were formed in the previous growing season. Soon, however, the seedling needs the interaction with the present environment to continue to grow and develop. (Already the swelling of the seed and initial substance transformations that lead into germination require warmth and water from the environment.)

The work of countless researchers during the past couple of centuries has shown that the plant needs air, water, the

soil with its minerals, warmth, and light to create its own living substance. This occurs through the miraculous process known as photosynthesis. The plant does not feed on other life as do animals; rather it creates living substance mainly out of these elements that it takes in from the environment.

If we say: “The plant develops out of the seed,” we focus on the necessary presence and activity of living germinal tissue in the seed. But we can shift our focus and say: “The environment (all I mentioned above) develops through the seed into the plant.” This is a strange formulation, I know. But what it does is to call our attention to the fact that a plant is not isolated. Its development is only in and through the world with which it has intimate connection. The plant is connected with a large world — one that extends at least to the sun — and this large world is transformed through the plant and becomes embodied in the processes of growth and development.

“The plant develops out of the seed” is a centered perspective — thinking from a center (seed) outward. It honors the potency of life inherent in every seed. (Remember the countless ways in which each particular species can bring itself to expression.) “The environment develops through the seed into the plant” is a peripheral perspective — thinking from a broad context towards a center. Here we see the environment in its plant-forming potential. Only in the active interplay of this center and periphery does life manifest in growth and transformation. Each plant species is a revelation of a particular way of being and at the same time a revelation of the world in and through which it develops. A plant vitally seen and understood is world-plant.



10. Gesture — The Inner Coherence of a Plant

We all “know” that each part of an oak tree, a dandelion, or a spinach plant belongs to that plant and in one way or another contributes to its existence. In this sense we take the wholeness and inner coherence of the plant for granted. The question arises: Can we learn to see how the parts cohere, how they are expressive of a unified character or quality? All the exercises described so far facilitate the

forming of capacities for such holistic insight. What is the “oakness” in the oak, the “calendulanness” in the calendula? The goal is not to be able to nail down that character, but to see if through moving through the parts of the plant and the way it relates to its environment something of that character shows itself as an inner quality, as a kind of gesture. It may be very hard to communicate that character, but in group work we can share impressions and attempt to express the character or gesture in words, movement, drawing, or by other means. In my experience, we often do come to a similar sense of that “something special” that shines through the characteristics of the particular species.

One fruitful way to get closer to the expressive character of a plant is to compare it with another plant. First go into the characteristics of one plant in the ways already described: looking carefully; sharing with others; inner re-picturing; moving through the plant so that its process-character becomes more evident; seeing how different specimens relate to their environments and are expressive of it. When we have done this with one plant, we carry the impressions of that plant within us.

As a next step we turn to another plant. The experience with the first plant will illuminate the study of the second plant, just as its characteristics shed light on those of the first plant. It is good to choose a not too distantly related plant. For example, we compare one broad-leafed tree with another, or two wildflowers or vegetables that are in the same family. If we study an oak, the study of the maple will be enlivened by the oak.

It is not a matter of just registering: The oak has leaves, branches, bark, and fruit like this and the maple ones like that. When we observe the forms as expressions of formative moments, which we can do by carefully and consciously moving through the forms with our imagination as we observe, characteristic gestures may appear in the different features of the plant. Can we begin to see how the different aspects of oak speak “oak” and the different aspects of maple speak “maple”? In my article, “Phenomenon Illuminates Phenomenon” (see references), I have tried to express what course participants and I have discovered in carrying out this practice when studying two prevalent species in the forests of eastern North America, the white oak (*Quercus alba*) and the sugar maple (*Acer saccharum*).

An alternate entryway into this kind of study is to begin, say, with the leaf or fruit of an oak and then consider the leaf or fruit of a birch tree. What does the tiny, almost weightless fruit (nutlet) of the birch tell us about “birch”? What does the acorn tell us about “oak”? How different they are from each other! From these contrasting ways of

fruiting, we can then move onto the other features of the tree and see what shows itself.

This mode of gestural inquiry can be expanded into the study of different plant families. We

study, say, a number of different grasses and build up a picture of their salient features. When we then shift to studying the legumes in the same meadow, we discover a wholly different way of being — a different way of being plant.



FURTHER RESOURCES AND REFERENCES

- Goethe, J. W. *The Scientific Studies* (D. Miller, Ed. & Transl.). Princeton: Princeton University Press, 1995.
- Holdrege, C. *Living Perenniality: Plants, Agriculture, and the Transformation of Consciousness*. Middlebury, Vermont: New Perennials Publishing, 2021. (Free download at: <https://www.newperennialspublishing.org>)
- Holdrege, C. *Thinking Like a Plant: A Living Science for Life*. Great Barrington, Massachusetts: Lindisfarne Books, 2013.
- Holdrege, C. “Phenomenon Illuminates Phenomenon,” *In Context* #26, Fall 2011. <https://www.natureinstitute.org/article/craig-holdrege/phenomenon-illuminates-phenomenon-white-oak-and-sugar-maple>
- Holdrege, C. “Doing Goethean Science,” *Janus Head* vol. 8.1, 2005. <https://www.natureinstitute.org/article/craig-holdrege/doing-goethean-science>
- Holdrege, C. “The Forming Tree,” *In Context* #14, Fall 2005. <https://www.natureinstitute.org/article/craig-holdrege/the-forming-tree>
- Merleau-Ponty, M. *The Essential Writings of Merleau-Ponty* (A. Fisher, Ed.). New York: Harcourt, Brace & World, 1969.
- Ruskin, J. *The Elements of Drawing*. New York: Dover Publications, Inc., 1971. (This book was originally published in 1857.)