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# Penultimate draft

# Engaging in the Goethean Method: An Approach for Understanding the Farm?

### Isis Brook

Crossfields Institute

### **Abstract**

The Goethean method is presented in an accessible way as a series of practical steps that guide the reader into a deeper relationship to any aspect of the farm. Using the example of working with a plant, this chapter takes the reader on a journey that can help them to develop, what Goethe called, new organs of perception. At the heart of this method is developing and utilising human faculties, such as imagination and intuition, in a disciplined way that allows them to play an insightful role in a holistic understanding of the land and of ourselves. The four elements of earth, water, air and fire are used to assist with feeling each of the shifts in consciousness that are involved in the Goethean approach. This journey challenges the reader to step outside their usual preconceptions and, through a type of phenomenology, allows them to experience subjectivity in a new way. The experience sheds light on Goethe's idea of delicate empiricism as an approach to scientific understanding. For agroecology, the Goethean method can give a fresh view of land and how it can be worked with – what its needs are and how to enter into collaboration with it. This need not replace other approaches, but may accompany other forms of exploration for a fuller understanding of the being that we collaborate with, when we engage with land.

### Introduction

In my first chapter in this book, I provided some background to Goethe's scientific work and indications of why it might be relevant to us today in developing a holistic approach to farming and to agricultural research. This approach can help with both our understanding of the world and how we might see ourselves as working in harmony with it. This chapter sets out a way of working that follows Goethe's indications on how to develop 'new organs of perception'. The applicability of this to agroecology is as much to do with adjusting our own way of being for a better understanding of the land and our relationship with it, as it is about how or what to plant or harvest.

As we saw in the earlier chapter, key aspects of Goethe's approach are: to hold back on theorising; to open oneself to the phenomenon being studied (be that a plant, an animal, a landscape or a farming community); to use our human faculties such as imagination, inspiration and intuition in the service of the thing being studied and to approach it as part of a whole that is in constant creation.

### **Goethean Observation as a Careful Process**

Goethean observation as a means to come to know a phenomenon is widely recognised as having four stages (Bockemühl, 1985, Hoffmann, 2007, Holdrege, 2005, Seamon and Zajonc 1998). This chapter draws from the training given by evolutionary biologist Dr Margaret Colquhoun and others through the Life Science Trust<sup>1</sup> and the author's subsequent working with and studying this approach, to inform what is set out here.

<sup>1</sup> The Life Science Trust organised a remarkable series of seminars through residential workshops (some 7 or 9 days and some 3 weeks), each focused on a particular realm of nature, for example, rocks or plants or animals. They were held over a number of years between the 1990s to 2000s at various venues in the UK and, latterly, at The Life Science Centre, Pishwanton in Scotland. Participants generally attended at least four workshops to experience this method with a range of phenomena such as: colour, the plant, the animal, the human skeleton or the landscape.

The four stages are usually preceded by a preliminary stage of recognising one's habitual responses. In my own practice and my own teaching of this process, I place more emphasis on this pre-stage than others do. Perhaps, this is because I am a philosopher by training and thus am aware of the epistemologically controversial nature of claims such as 'being able to see how the world really is'. Moreover, this pre-stage is useful for highlighting that Goethean observation requires a challenging switch from our culturally habitual dualistic thinking to a more holistic thinking.

A real strength of the Goethean approach is that it lays out a formal staged process. Skilled practitioners will move between and meld these stages, but to begin with, it helps to explore them in a systematic way. This might seem and, at times, feel slow and pedantic, but the point is that we can follow consciously and rigorously what is happening in the world and in ourselves as the practice progresses. Experiencing this process can sometimes be unnerving or strange; for example, we may become aware for the first time of odd physical responses, insights or mystical states. However, we now have a careful record and thus a fuller understanding of this shifting relationship between our external and internal worlds that can then be moved into and out of by retracing our steps.

# **Choosing the Thing to Study**

As with any research question or journey of enquiry, we need to have a focus – what is it that you will be observing? For early practice with Goethean study, it is good to work with something that draws your attention in some way; not necessarily something you already know a lot about or for a practical purpose – that can come later when you are familiar with the method. Being able to find the thing that it would be fruitful to study is as much about waiting for it to call you, to just wander around and let something strike you. This requires patience and a child-like receptivity to hear what it is about the world that you are particularly suited to explore. Being drawn to something could be an attraction or curiosity or it could be a feeling of revulsion or challenge – a troublesome 'weed' plant, for example.

When teaching this approach, or helping people to familiarise themselves with it, I always recommend working with some aspect of the plant realm to start with, even if your later

focus will be on an animal or landscape or something from the human realm such as an organisation or farm community. The plant was foundational for Goethe's understanding of his method of investigation. Practice with a plant yields benefits later on with more complex organisms, such as animals, and less responsive entities such as rocks. With a plant you can more easily reach an understanding of what these stages feel like and so be more comfortable about the process.

Before moving on, you need to have selected – or perhaps we can say you need to have been selected by – your plant.

# **Pre-Stage: Clearing the Workspace**

Our ways of thinking, feeling, moving, responding and simply being in the world are shaped by our physical environment, culture, personal history and a whole web of interactions. Many of these are permeated by the dominant Western tradition of mind-body dualism, scientific reductionism and the practical concerns of survival. It is one thing to know this but quite another to escape it. Mind-body dualism, for example, shapes our language so that even to express how something could be different involves using the language that has developed to embody how it is always assumed to be. For example, even when we talk of the environment, the use of 'the' separates us and places us outside of that in which we are actually environed. The process of Goethean observation is a honing of the human being as a scientific instrument. If this is what we are going to be engaged in, understanding the starting point – that is, our normal way of thinking and being – is going to be essential.

To clear the workspace, we need to take a preliminary look at what is actually there and how it usually works. In the Goethean process, this is done by approaching your chosen phenomenon in a normal, everyday way and then setting down your first impressions in whatever form they may take. Examples of the kinds of impressions that can emerge in this part of the process are: your habitual likes and dislikes, how you might use it, feelings of boredom or anger, snippets of information, inspiring ideas or urges to put something right and so on. What is different, and what makes this the pre-stage of a process, is that instead of acting on these impressions or continuing them with further thoughts or day-dreams, we consciously lay them

out for inspection and then set them aside. Keeping a record of these thoughts and feelings is an important part of the process. By naming attitudes and presuppositions that are in the background, you can spot when they might creep in to your work in the later stages of the process. That said, a first impression may be very perceptive and its veracity may re-emerge later on.

What should become apparent is just how much the Goethean method involves selfexamination and critical reflection. It is a qualitative approach to the world, but not one that revels in undisciplined subjectivity.

Before moving on, you need to have made some notes about your usual thoughts and feelings about your phenomenon. A small journey into speculation about the origins of those attitudes can be helpful, but without holding up the next stages of the process that need to be worked through far more slowly.

# **Stage One: Exact Sense Perception**

The first proper stage is characterised by standing away from that very personal first encounter and observing the phenomenon freshly. Try to experience your chosen phenomenon as if you had never seen it before. From that perception, begin to record all that you can about the phenomenon. Recording as you go is important: have a note book and writing/drawing materials to hand. It is important to remember that you have multiple senses, so don't just concentrate on sight. With plants, smell and texture are obviously important as is, for example, response to the wind. Taste can also be explored — with caution (do check that your plant is not known to be poisonous before tasting it). You are in a process of meeting a being and, as the pre-stage emphasised, you need to do that on its own terms without overlaying it with your own preconceptions or normal ways of thinking. Not only personal feelings, but also any known theories about a phenomenon need to be held back in order to let the 'facts' speak for themselves. This practice can be seen in Goethe's extraordinarily detailed observations of colour phenomena. Rather than draw hasty hypotheses or work from an existing theory, such as Newton's, his painstaking investigations followed every conceivable avenue of experimentation (Sepper, 1988). Thus for Goethe, finding out about the nature of colour

involved aspects such as: complimentary colour afterimages, how artists use colour, how dyers use reagents and so on, rather than just the latest ideas on colour from physics.

Recording your observations can be done in a number of ways such as writing detailed descriptions. However, drawing the phenomenon is one of the best ways to focus your attention on the hitherto unnoticed detail and the relationships between parts. If your aim is to really see a particular tree that happens to be an oak, drawing can be very helpful to prevent you slipping into your usual 'seeing oak trees' mode of perception. Artists have the additional problem of having to avoid their personal 'drawing style' influenced mode of perception. The categorised artefact that your usual mode of perception creates, must be ignored in order to let you see the oak tree as if you had not seen one before. 2 Such exercises can include drawing the outline of a plant without looking at the paper, using shading for depth with no regard for actual shades or shadows, or creating the form by shading the outside area of the paper as if chipping the form from a block. You could also use watercolour paint, pencils or pastels to mix the exact colour of different parts. One of the most useful drawing exercises, and this one should never be left out or cut short, is to draw from memory. You may think that you know everything about the appearance of a plant, only to have that assumed knowledge disappear the moment the plant is hidden from view. Drawing from memory by closing your eyes and building in your imagination the plant as you have come to understand it, is extremely helpful in trying to build the bridge – so crucial to Goethean science – between the phenomenon and the human being as a scientific instrument. You need to set aside any personal concerns about your ability to draw; the point is not to produce a beautiful picture, but to train your perceptions.

Another tool you can use is to ignore pre-existing knowledge, for example, the names of things, and instead to see and describe them outside of learned classifications. This restriction on nomenclature is helpful when sharing observations in a group. Finding a word that expresses

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<sup>&</sup>lt;sup>2</sup> A number of drawing exercises are helpfully detailed in Margaret Colquhoun and Axel Ewald's 1996 book *New Eyes for Plants: a Workbook for Observing and Drawing Plants.* 

what you are seeing rather than taking the ready-made one prompts more looking and thus more potential to see fresh relationships. Still, it is impossible to continue in exact sense perception indefinitely. To register all the great amount of variety and detail would be, as Goethe said, 'like trying to drink the sea dry'. (1995: 24). Simply amassing facts about the phenomenon as a static object at the moment at which we are observing it will not allow you to really see what the thing is nor come to any firm idea of it. Exact sense perception is only the foundation on which the following stages rest and to which they return, when necessary, to compare conclusions reached by other means.

Jochen Bockemühl's work on phenomenology (1985) uses the four elements (earth, water, air, fire) as a helpful way of characterising each of the stages. This first stage has an 'earth' quality: the solid facts are gathered, and the feel of the process here is one careful exactitude. Although fascination with detail is appropriate, we should not get carried away. For some, this stage is experienced as being rather tedious, yet for others it is very satisfying, and such differences in themselves show something of our personalities. In the training mentioned earlier, we spent several days on each stage with our chosen phenomenon. With the plant it can be hard to stay in this mode, for example, you will be tempted to describe things as 'growing' or 'wilting' and generally anticipating future states or imagining past ones that you think you have known; it is quite a discipline to hold those imaginings back and stick with the present.

Before leaving the first stage, it is also worth mentioning that, in gathering information, you may also use secondary sources. It can be helpful to know what other people have discovered. For a plant, you could turn to some botanical knowledge, or the relevance of the plant in agriculture, herbalism, myth or even the language of flowers in mediaeval paintings. The important point about using secondary sources is to avoid them to begin with (apart from checking in regard to poison) and then have a sceptical eye and always return to the primary source, the plant itself, for verification. You need to be alive to the fact that with secondary sources you are gathering what other people have said and they could be working from presuppositions and not from the plant itself. Secondary sources might give you new ideas or other forms of access to your phenomenon or questions to pose for further investigation. On

the other hand, it also gives you more material that you have to set aside in order to really see the plant.

Do not move on until you have a collection of drawings and descriptions and a solid feeling of getting to know the 'what is' of your plant. This will provide your anchor for the work ahead.

### **Stage Two: Exact Sensorial Imagination**

With the previous stage, you were attempting to capture what the phenomenon is presenting to you right there in the present. The activity was about being exact about what you see, hear, feel or smell etc. but the entity you are studying cannot really be captured in a frozen present. It exists as a process, and so to get to what it really is, you are going to have to live into that process yourself so that you can begin to accompany it in its being. We do this by using the human faculty of imagination, but not imagination as we often think of it in the human realm as distanced from reality. Imaginative activity in Goethe's sense is called by him 'exact sensorial imagination' (Bockemühl, 85) and it builds on the rigour of the previous stage, but now it is set in motion. The aim of this activity is to perceive the phenomenon as a dynamic entity. Just as the previous stage required a certain policing of one's usual ways of thinking, our imaginations also need some schooling to allow us to stick with the phenomenon, not as we have come to know it as an entity frozen in time, but as a being in process. Working with a plant often draws us into this mode (observing growing, wilting, etc.), so you may have already ventured into it and had to hold back.

There is something dreamlike about this stage. However, because we have already lain aside our theories, our presuppositions and undergone a rigorous working in exact sense perception, our dreams are in the style of the phenomenon and not drawn from our own personal fancies. These experiences need to remain dreamlike, because any fixing of them will put us back into the first stage.

One of the easiest ways into experiencing this type of imagination, and seeing how it could lead to understanding something about a phenomenon, is through Goethe's work on the metamorphosis of plants. It is here that we can see his use of exact sensorial imagination as a kind of shift in consciousness that now connects with the phenomenon in a new, but

nevertheless still rigorous, way. The most immediate easy experience of moving a plant imaginatively is through observing with plants at different stages of growth. For example, you could be studying a particular wild carrot (Daucus corota) but around it are others at earlier and later stages of growth or flowering or fading. Thus, you can imaginatively take your wild carrot backwards or forward in time using these others as indications of your plant's process. It is also possible to enter into the plant as a process in a freer way through what Goethe called its discontinuous metamorphosis. Many plants produce a sequence of different leaves, often beginning with a simple shape, becoming more differentiated and then contracting to a more pointed form and eventually there is a transition to the flower parts (Holdridge 2013:76). To school our imagination, we could imaginatively move through this sequence, as if from the inside of our plant. We could even imaginatively produce leaf forms that could appear in between those that are evident in the plant. This helps you to experience the plant as a dynamic process of metamorphosis as opposed to recording only its visual form. (If your chosen plant does not show any obvious aspect of this metamorphosis, you could practice with one that does, such as mustard, buttercup or groundsel, to get a feel for these changes before returning to your plant.) Jochen Bockemühl, whose work makes extensive use of leaf sequences, explains the process and shows just how different this kind of watery perception is from the earthy style exact sense perception of stage one.

With the mode of observation corresponding to the watery element, it becomes possible to go beyond the single elements of form and reach a realm not directly accessible to sense perception; here the sequence of forms appears as formative movement, and the formative forces can be experienced. If something is observed as an object, it is always seen from the outside, it is seen separately and seemingly from all sides at once. There, one's own standpoint is unimportant. The object exists without me. If, however, one begins to become aware of the formative forces in the way described, one's own inner activity (intentionality) and one's own position within the whole becomes significant.

Bockemühl (1985: 21)

With any living entity, it is easy to move into this second stage because the phenomenon simply seems to require it. We cannot capture the livingness of a plant if we stick with exact sense perception. Our thinking in that mode is too static to live into the phenomenon and experience it as changing and growing. Something of the phenomenon has to live in us if we are to make a

connection between, for example, the sapling and the tree. Our thinking has to be mobilised to grasp the becoming of nature and the way nature is constantly creating. Although we know plants grow and change in ordinary consciousness, here we experience it afresh and understand it in a new way.

It is imagination that makes this mobilisation of our thinking possible. In this mode of perception, we are living in the phenomenon as a process. We are imaginatively engaged in those same processes. We need to enter this not by bringing in human meanings but by living in the phenomenon as the being it is. Although we cannot leave our humanity out of the picture, as this is the source of our imaginative ability, in this and the stages that follow we are placing our faculties *in the service of the phenomenon*. Exact sensorial imagination leads us to a holistic apprehending where we understand, for example, the plant as a metamorphosing possibility, connected to its place and to the plant realm.

Exact sensorial imagination exercises to help here include imaginatively growing your plant through a whole life cycle or imaginatively taking your plant through the seasons. The richer the pictures you can build, for example, the changing light, the changing insect visitors and so on, the more you will be sensing into the plant. Growing the plant in your imagination before sleep can be very helpful for continuing your study the following day. It seems to connect you with that dreamlike realm that is needed here and it facilitates the later stages. You could also try, with care, 'imagining it otherwise' (Brook, 1998: 55). This is where you purposely misuse your imaginative faculty to impose something on the plant, for example, imagining an ash tree is evergreen. The purpose here is to feel for a response. By now, you will be in a relationship with the plant and will feel (perhaps viscerally or emotionally) the wrongness of your imaginative fancy. Such a response kick helps to get you listening in to what is really there and tuning into where insightful responses might come from in your own body. It is the plant realm that gives us a clear picture of the need for this shift in our thinking if we are to understand a plant as a plant and not just as a marker in our system of classification or an entity to be utilised. This is where we can first detect that the empiricism, which in the first stage seemed exacting and pedantic, is now on a path to what Goethe termed a delicate empiricism. Delicate because it does not impose a theory, and neither does it deny the human

faculties their role in coming to know the world. Rather, the faculties have to treat the world with delicacy in order to find it, rather than just find humanness reflected in it.

Ensure you have felt the shift in consciousness into this dreamy, watery style of thinking and feeling before moving on. You should now be able to move freely into and out of the phenomenon and carry something of its being in your consciousness.

# Stage Three: Seeing-in-Beholding

Once you can shift your thinking into that fluid mode you can build up the phenomenon imaginatively through its changing forms. However, this still feels somewhat attenuated. It provides the training of the imagination so that you can now move on to tuning in to the phenomenon as it is, as a living whole, rather than as parts you bring together imaginatively. The element here is air. For this, you need to move even further back from your ordinary way of engaging with the world; you must even quiet your imaginative activity in order to make space for the phenomenon to present itself.

You need to be like air, not flowing through the forms like water, but making them visible. Using elemental language to describe these stages does not mean that we are looking for particular characteristics in a thing. You are not looking for airy aspects of the phenomenon; instead what you need to do is to be airy in your own consciousness. Bockemühl describes the way the observer must be:

It is characteristic of air to expand in all directions, offering its own being and activity in order that the being and activity of another can appear. Insofar as we move inwardly in accordance with this image of air, we reach the cognitional attitude corresponding to the air 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.

Bockemühl (1985: 26)

It is the human faculty of inspiration that now offers itself to the phenomenon. Through your stillness, the phenomenon can present its real self, and this is often felt as a particular gesture, a gesture that somehow speaks or presents that phenomenon. The insights that arrive in this third stage can seem strange to your normal ways of thinking. It can be exciting or emotionally moving, and because what arrives seems foreign to yourself, this enhances the sense that it is

given to you. It should feel like something received rather than made. These received indications can be captured and explored in some form of artistic representation where gesture and meaning are brought out and the inner mood is expressed.

You might find that this inspirational stage is best expressed in emotional language, which is paradoxical as it is far from the normal, self-absorbed emotional subjectivity. Working artistically with colour can also help to deepen the indications that arrive. What should be expressed is the being of the phenomenon, something of its essential nature. Again, do not be concerned about any lack of familiarity with, for example, writing poetically or painting, it is the process of attempting that is important.

Stage one gave us the solid facts that anchored our imagination to the phenomenon and allowed us, in stage two, to enter into the livingness of the phenomenon, which in turn gave us enough familiarity with it to see through to and express its inner/fundamental gesture. This gesture of the whole can push us into the fourth stage of being-one-with the object (Goethe, 1995: 75).

Make sure you have captured any insights into the gesture of your phenomenon. This can be hard to record in language or image, but try to get something down. While the process of writing, painting, moving or singing etc. is not just representation of the insight, it helps you to live into the insight and to feel it more deeply.

# **Stage Four: Being One with the Object**

The first three stages of the Goethean method involve different activities and ways of thinking, and these could be characterised as first using *perception* to see the form; second, using *imagination* to perceive its mutability and, third, inviting *inspiration* to reveal the gesture. The fourth stage uses *intuition* to both combine and go beyond the previous stages. Here we experience the 'what it is' of the phenomenon in its full power and potentiality. It is here that the phenomenon can be understood, and it presents itself to the human being as an idea or even a theory. Thus, in the Goethean process, we do not start with theory and overwrite the phenomenon with our own thinking, instead we place our human thinking and theorising capacities at the service of the phenomenon.

In terms of the elements, the shift in consciousness we now need is fire. This fourth stage is also the most physically abstract, having the least connection to the outer appearance of the phenomenon. However, that abstraction from the specific allows the perception of what is essential to the inner nature of the thing. Bockemühl calls this an experience of the 'being's beingness'. He expresses the fire stage thus:

We are here 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. At these moments of inner identity, all outer manifestations disappear. They are 'burned up'.

Bockemühl (1985: 30)

Fire or warmth is also suggestive of another feature of this stage: the connection to the inner impulse of the thing comes about through our own inner impulse to act. At this point, we are prompted to action, not only in the sense of wanting to express something of the being, as in the third stage, but to *do something about it*. We feel 'fired up'. Because of the journey that precedes it, this is not a subjective expression of your own personal will. The intention is to combine the being of the phenomenon with the human ability to both think and to act in the world.

How you arrive at this is harder to explain, in my experience it just arrives suddenly when working in stage three. It is as if from the acquiescent air process, where our usual thinking is held back, concept or idea or determination suddenly arrives, but with a strange clarity, a kind of shininess, that is unlike one's normal thought processes or perceptions. In teaching this method with groups, particularly with regard to landscape, it is interesting to note the difference between a pre-stage impulse to do something – make a change, clear an area, develop a path – and an impulse that arrives out of combining one's thinking with the phenomenon. The pre-stage and the four steps are intended to bring us to a point of understanding and collaboration with the phenomenon. Now we are in a position to move forward, to act in unison with the phenomenon.

### Conclusion

The stages with their indicative elements and human faculties emphasised can be summarised in Table 20.1 for ease of reference.

Table 20.1 The Four Stage Goethean Approach and Related Human Faculties and			
Elements			
Stage		Human Faculty	Elemental Feel
1	Exact sense perception	Perception	Earth – solidity
2	Exact sensorial imagination	Imagination	Water – flowing
3	Seeing in beholding	Inspiration	Air – surrounding but ephemeral
4	Being one with the object	Intuition	Fire – fast, concentrated

Once you are familiar with the shifts in consciousness of these four stages by experiencing them through a journey or two with something from the plant realm, it is possible to branch out to other realms and take a phenomenon such as a rock, or an animal. In terms of agroecology, this approach is particularly helpful when considering actions involving whole landscapes or particular areas of a farm or garden. Within a Goethean process, if you want to make changes inspired by insights from the fourth stage, you need to move forward further into a new set of phases that mirror the previous stages (3, 2 and 1). This is about testing out and double-checking a planned action before landing it (earthing it) in the world.<sup>3</sup>

This approach is a means to begin the process of undoing our habitual dualistic patterns of thought, and nourishes new organs of perception that are receptive to, and respectful of, nature so that we might begin to glimpse what nature really is, what place we have within it and how we may collaborate or co-evolve with it.

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<sup>&</sup>lt;sup>3</sup> A *useful* discussion of these mirrored steps with practical examples can be seen in Christopher Day's 2003 book *Consensus Design: Socially Inclusive Process.* 

How might such an approach impact on agriculture or agroecology? To some extent, this can be seen in biodynamic agriculture where, for example, understanding the whole farm as an organism captures something of Goethe's holistic vision. This should be no surprise as we saw in my previous chapter in this book how Rudolf Steiner's work on the Goethe archives influenced his approach to agriculture. However, as the presentation of the stages of the Goethean method above has shown, this should not be viewed as a system to be applied, rather, it is about a personal engagement and the transformation of your thinking and your being for more responsiveness to the climate, land, people, animals and plants that form the basis of the agroecological vocation.

### References

Bockemühl, J. 'Elements and Ethers: modes of observing the world' in Bockemühl, J., Lindenau, C., Maier, G., Müller, E.A., Poppelbaum, H., Rapp, D. and Schad, W. (1985) *Towards a Phenomenology of the Etheric World*. NewYork: Anthroposophic Press Inc.

Brook, I. (1998) Goethean Science as a Way to Read Landscape. *Landscape Research* Vol 23:1, pp. 51-69.

Colquhoun, M. and Ewald, A. (1996) New Eyes for Plants. Edinburgh: Hawthorn Press.

Day, C. (2003). Consensus Design: socially inclusive process. Oxford: Architectural Press.

von Goethe, J.W. (1995) *Scientific Studies* ed. and trans. Miller, D. New York: Suhrkamp Publishers.

Hoffmann, N. (2007) Goethe's Science of Living Form. New York: Adonis Press.

Holdrege, C. (2005) Doing Goethean Science, Janus Head 8:1

Holdrege, C. (2013) *Thinking Like a Plant: a living science for life*. Great Barrington, MA: Lindisfarne Books.

Seamon, D. and Zajonc, A. (1998) Goethe's Way of Science: a phenomenology of nature. New York: SUNY Press.

Sepper, D. (1988) Goethe Contra Newton, Cambridge: Cambridge University Press.