# Learning to See Life

## Developing the Goethean Approach to Science

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I have often thought that if a teacher wanted to have one succinct motto to hang above his or her bed, she'd have a hard time finding a better one than: "characterize, don't define."

In order to characterize, say, an animal, we have to carry within ourselves a vivid picture of its shape, how it moves, the sounds it makes, its habitat and the ways it relates to its environment. We bring alive through our imagination and speech something of the animal's nature.

We learn, for example, how the sloth spends its life hanging in and slowly moving through the boughs of rain forest trees. It recedes into its environment to the degree that it lets algae grow in its fur, which soaks up rain like a sponge, and the resulting greenish tinge makes the sloth nearly invisible in the tree crowns. It is so adapted to hanging that it is virtually helpless on the ground.

Everything about the sloth is slow — it moves slowly, it digests slowly (only climbing down to the ground once a week to, as the students would say, pee and poop), it grows slowly, reacts slowly and seems largely impervious to pain.[1] When we paint a picture of the animal in this way — a process in which the students are involved — the animal can begin to live in the soul of the child or adolescent.

Characterization imbues a subject with life. To define may make something clear, but it is the kind of clarity that is all too often void of life. When Rudolf Steiner, the founder of Waldorf education, urged teachers to characterize and not define, he did so because he knew that through characterization we form living concepts that can grow and transform.[2] A definition, by contrast, is fixed.

Unfortunately, it is often within biology classes, with all the rote learning and memorization of definitions for multiple choice exams, where traditional outcome-based education reaches its unhappy epitome. And biology is supposed to be the science of *life*. Charles Dickens gives a lovely caricature of this way of teaching in his novel *Hard Times:*

> "In this life, we want nothing but Facts, sir; nothing but Facts!"….
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> "Bitzer," said Thomas Gradgrind, "your definition of a horse."
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> "Quadruped. Graminivorous. Forty teeth, namely twenty-four grinders, four eye-teeth, and twelve incisive. Sheds coat in the spring; in marshy countries, sheds hoofs too. Hoofs hard, but requiring to be shod with iron. Age known by marks in mouth." Thus (and much more) Bitzer.
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> "Now girl number twenty," said Mr. Gradgrind, "you know what a horse is."

Of course, we all need to learn facts, but isolated facts are soon forgotten and are like stones instead of nourishment for the human soul. What the students need is to see how the facts relate to each other, how the parts of an organism interact in service to the life of the whole creature. You could say that all real knowing is ecological knowing—knowing how something is part of a larger, dynamic context. If we can bring students into this way of knowing, we are preparing them for a life in a world that will not offer them pat solutions, but demand from them the ability to

grow and form new ideas in relation to new and unforeseen demands.

The problem is that modern habits of thought and academic training, which encourage, above all, analysis and abstract theorizing, do not give teachers the tools they need to bring this kind of understanding to students. In fact, they tend to deaden both the propensity toward quiet and open-ended observation and the concrete, imaginative capacities teachers need most in order to build up exact, yet living pictures of the world.

## Bringing Thinking to Life

Already over 80 years ago, Steiner saw that teachers came out of the "system" with rigid, one-sided habits of thought. He saw the Goethean approach to nature and science as a key enabling teachers to transform their own thinking and bring a more vital reality to their students:

> Our way of thinking is inclined to place things side by side. This shows us how little our concepts are geared to outer reality. In outer reality things flow together…. We need to think things together, and not as separate from each other. A person who wishes only to think things separated resembles a man who wishes only to inhale, never to exhale…. Here you have something that teachers in the future will have to do; they must above all acquire for themselves this inwardly mobile thinking, this unschematic thinking. Science will have to wake up in a Goethean sense and move from the dead to the living. This is what I mean when I say again and again that we need to learn to get beyond our dead abstract concepts and move into living, concrete concepts.[3]

In our work at The Nature Institute, we are committed to helping teachers and people who want to become teachers work on this transformation. One of the challenges of this task is that learning an approach that aims to reveal life in nature entails both ridding ourselves of ingrained habits of thought and mobilizing new forces within ourselves. This process takes effort and time — it does not happen overnight. In our mentoring work, we see that this transformation can occur through focused work over a longer period of time on a concrete research project.

For example, what better way is there to learn a living approach to nature than learning from the master of life on earth, namely, the plant world? We can carefully observe how a specific plant develops — unfolds, transforms, and ages. We sketch the plant and recreate precisely in our imagination its development. In this way, we take the plant as a living process into our own minds and mold our thoughts around it. When we observe other plants and make comparisons, we begin to see the specific style of growth and form in a given species. We then go further and relate the plant to its habitat: Under what kinds of conditions does it thrive? How does it vary under different conditions?

This kind of immersion schools our observation (we become awake to the world around us) and because the plant lives through change and variation, our thinking becomes more mobile and flexible. You could say we're beginning to think like a plant grows. And since we have taken something of the richness of the plant world into us, we can build up pictures that are rooted in reality and out of this, living characterizations can flow.

An important element in this work involves attending to our own inner activity. We need to become keenly aware of how our thought processes interweave with our observations. Goethe spoke of "delicate empiricism," a felicitous expression that captures the two fundamental features of scientific study.[4] We orient our attention closely to the phenomena we are observing, but we also learn to become more aware of our own thought processes so that we apply our concepts in a more careful, circumspect way. Living, vital concepts are ones born out of the interaction with the phenomena themselves.

Traditional training in science often puts roadblocks in the way of this approach. Anyone

studying biology today learns that *the* question to ask in reference to any phenomenon is: What is the underlying mechanism? This way of asking becomes habitual and in essence the only kind of question one is allowed to ask (as a scientist). This puts a straightjacket on scientific inquiry and, inasmuch as the focus is on mechanisms, it is already a foregone conclusion that life is nothing other than a mechanism. However, the moment you begin — in a more open-ended way — attending to the fuller phenomenal reality, say, of a developing spring wildflower, you soon realize how inadequate mechanistic explanations are. They pale in the face of the plant itself.

When we really take hold of the Goethean approach — *through immersion in the phenomena themselves and self-aware thinking* — it teaches us to be more critical than we are when we teach theory- or model-driven science. This is important to note, since there is the misconception that the Goethean approach is somehow "just" about observation and therefore "soft" (or even worse: warm and fuzzy) in comparison to "real" (whatever that is) science. Nothing could be further from the truth.

The Goethean approach is not about opposition to traditional science; it is concerned with evolving the discipline of science further so that we can begin to understand life in a way that is modeled after life itself. For this to occur, we have to work to transform ourselves as human beings and begin forming, as Goethe put it, new organs of perception. Through this practice, we begin to experience science as a truly human endeavor that leads us to an understanding and recognition of the deeper qualities of life on earth. We gain the capacities we need as teachers to bring the living world close to the hearts and minds of our students.

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## Sources

[1] Holdrege, Craig. "What Does It Mean to Be a Sloth?" *NetFuture,* #97, Nov. 3, 1999. (Revised, 2009, Ghent, NY: The Nature Institute: http://natureinstitute.org/nature/sloth.htm )

[2] Steiner, Rudolf. *Foundations of Human Experience*, Lecture 9 (August 30, 1919). Great Barrington, MA: Anthroposophic Press, 1996.

[3] Steiner, Rudolf. *Education as a Social Problem,* Lectures 4 and 6 (August 14 and 16, 1919). Great Barrington, MA: Anthroposophic Press, 1984.

[4] Goethe, Johann Wolfgang. In *Goethe: Scientific Studies*, Edited by D. Miller, p. 307. Princeton: Princeton U. Press, 1995.