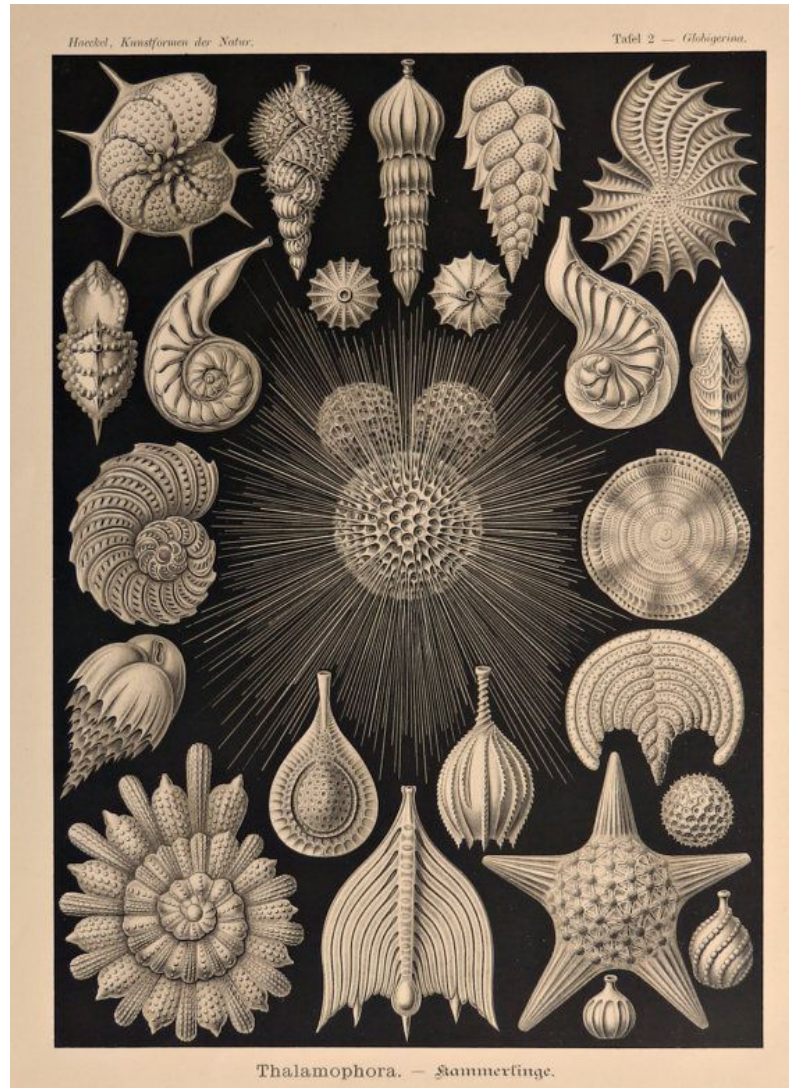


On Science and Belief

To be born to the world today is to find oneself cradled between both the miraculous gift of breath, alongside the breath-taking visions of a mass departure of life and the relations around us. Many who've awoken to the environmental crisis seek refuge in the development of science and technology as a means to respond to such adversarial times, while others turn to consciousness and spirituality as a means for liberation. Through the length of this paper I will describe—with perhaps fewer words than the topic demands—a third path, or perhaps rather an infusion of the two; that science and spiritual belief are and have been bound together since the inception of scientific thought. I suggest that while scientific understanding can lead to spiritual understanding, the marriage alone is not enough to support life on Earth, and contend that Western science—as one originating in anthropocentric beliefs—enacts conditions upon the Earth non-conducive to the network of relationships by which we are interdependent.¹ Therefore, I prefer not to focus on scientific knowledge itself, but rather upon the culture by which scientific knowledge is held, as the deeper measurement of its impact on human behavior, and thus, the Earth. To realize these intricacies, I believe it serves to trace the lines of Western science through aspects of its evolution, its sheddings and transformations, from Descartes's dualism to Haeckel's Monism and eventually, to what I support as an alternative and generative way of approaching science as a whole.

¹ My focus here is solely on science as developed in the West, and does not aim to generalize the complex and ancient sciences that have evolved in different places and times around the world under one umbrella, nor do I seek to centralize Western science as superior to other systems of knowledge.



(Thalamophora, Tafel 2, after Haeckel 1904)

On the night of November 10th, 1619, a young René Descartes fell asleep to receive three dreams. Though the meaning of these dreams continue to bear no end of argument and scholarly fixation, Descartes himself held no doubt that within the third dream, he was approached by the Angel of Truth, who blessed him with the wish “that the treasures of all the sciences be unlocked for him” (Gabbey & Hall 1998). Whether the ‘treasure of all the sciences’ is an obtainable acquisition or not, I would argue (in an irreverentially-distilled form) that

Descartes' own interpretation of his dream would in essence, grant him the permission of God to seek human dominion over the physical universe, through the power of science (Harrison 2009). Descartes was not alone among a lineage of scientific thinkers and philosophers who held this sense of righteous duty to God through science, nor was Descartes's Cartesian Split the debut of Dualism—the idea of mind and matter as separate. Galileo, Sir Francis Bacon, Sir Isaac Newton, among many others, held firm to the belief that control over nature was essential to the order of Man. To maintain this outlook, I believe a social structure was needed—to not simply justify dominion of humanity over the natural world—but to expel the thought that justification might even be needed.

No matter how revolutionary Descartes and others may have been at the time, the Church remained the ruling power, and so the pursuit of truth had to be in service to God. For this, a particular form of Christianity emerged—one rooted in science. One where Adam became not just original man, but original scientist (through naming all of God's creations), and the natural world as one fallen from grace, where Man's only way back into Eden lay through the dissection and understanding of the physics of the universe (i.e. the ways of God) (Harrison 2009). Within this world of order and reason, the 17th Century shaped God to something more of a Cosmic Watchmaker, and the Universe—His perfect machine. As Descartes expressed, man must “borrow all the best from geometric analysis and algebra,” and with God's blessing, “thereby making ourselves, as it were, masters of and possessors of nature.” (Thomas 2006). Though the subsequent years have brought immense scientific advancements and shifts in consciousness, I suggest that the foundation of Western science remains, even today, rooted in a mechanized and anthropocentric world-view.

The 19th Century brought many such developments and foremost among them, the budding of a new form of scientific study in the West: ecology. Here's a word that has gone

through innumerable renditions of understanding, has been applied to incalculable book titles, and in recent times, I would even say wrung for all its worth. This is not surprising however, as the language people turn to tends to reflect the needs and urgencies of the times they live in. It would seem, even, that words themselves are equally subject to the tendencies of evolution as are their human counterparts. They are born in one place, migrate, mutate, form new relationships to the context they find themselves in, and adapt to the needs of the people in that specific time and place. For this reason, I believe it serves to return to the origin of the term ecology, that we may locate ourselves, and go forth.

In the year 1866, the word came to zoologist Ernst Haeckel in his first major text, titled *Generelle Morphologie der Organismen*. However, “the readership of his ambitious 1866 tomes was not as great as Haeckel had hoped, so he gave a talk on his vision of zoology to the Jena faculty in January 1869” (Egerton 2013). In this address, Haeckel unveiled that:

by ecology we mean the body of knowledge concerning the economy of nature—the investigation of the total relations of the animal both to the inorganic and to its organic environment; including, above all, its friendly and inimical relations with those animals and plants with which it comes directly or indirectly into contact—in a word, ecology is the study of all those complex interrelations referred to by Darwin as the conditions of the struggle for existence
(Haeckel 1866, cited in Allee *et al.* 1949).

As one proficient in Greek, Haeckel drew the word from the Greek root, oikos—signifying household, home, or family. That Darwin manages to make it into Haeckel’s definition of ecology speaks to the reverence with which haeckel held him, and it can be said, by which Haeckel was overshadowed by him. Many of Haeckel’s critics would agree with the zoologist Robert Stauffer in saying that “what was good in his ecology he got from Darwin, and what was misguided, he got from himself” (Egerton 2013). Upon my initial study of Haeckel, I had very

much fallen into this agreement, however upon further study, found that Haeckel was a distinctly more complex figure than the world would grant him.

What I believe Ernst Haeckel achieved—even in his mistakes—was to illuminate and draw together the inherent relationship of science and spirituality, and through the struggle of his own life's challenges, fallacies, and successes, inhabit that unity through the work that he created. What I've found is that Haeckel is an incredibly difficult man to understand; evasive in both his personal life and scientific perspectives, often contradicting himself, or at least contradicting the reader's expectation of what his perspective 'should' be. For most, he has been deemed "the one who got it wrong" with his theory of biogenetic law—the belief that ontogeny recapitulates phylogeny—or in more comprehensible terms, endeavors to say "that an organism in its embryological development passes through stages representative of its ancestry" (Blackwell 2001). Though this view has long since been disproven, and has caused much outrage among university professors, there is one aspect of it that I've come to appreciate; the implication that within a single human body resides multitudes of the animal kingdom. At a time of such anthropocentric glorification of "man over nature," one must see the societal-boldness of this thought. Though clearly inaccurate in its science, it asks of the mind to attempt something very foreign to Western thought; it asks the mind to receive the non-human world not as an externalized otherness, but as something within the body, penetrating the evolution of self.

One can see, over the course of Haeckel's life, a transitioning that follows the path of many scientists-gone-philosophers. In the early stages of his career, I found his writing hard to read, inflammatory, and prideful. That despite his joy at beholding the beauty of the living world, he remained stuck in the struggle of his own ego, of proving and establishing a place for himself among his contemporaries. As he grows older however, something shifts. Whether it's

the death of his first wife, or the humility that comes with age, his writing softens and over the years, begins to find orbit around something beyond his own personal achieving (Richards 2008). The year 1874 brought about the early stages of this transition with the publishing of his book *Anthropogenie*, and the introduction to his theory of Monism. He writes that “Unitary philosophy, or Monism, is neither extremely spiritualistic nor materialistic, but constitutes instead fusion and combination of the opposed principles, that is, it views nature as one whole and in no case recognizes any causes but mechanical ones” (Haeckel 1874). This view constitutes one of the subtler philosophical paradoxes that I’ve so far come across. Monism approaches the mechanistic world-view of the 17th Century—what one can conceive of as the established laws of Western science—and applies it to a non-dualist, sentient, living world. In essence, what this allows for is a spiritual-science where “there exists (in the sense of Goethe) no opposition whatsoever between nature and mind, between World and God” (Haeckel 1892).

Here is where something new, and half-invisible, enters the story. When Western science is introduced to the possibility of regarding “. . . all matter as ensouled, that is to say, as endowed with feeling,” the paradigm by which the scientist is placed as separate from the focus of their study begins to dissolve (Haeckel 1893). At this point, the ecological phenomenon of which the scientist aims to observe, manipulate, and yet remain apart from, becomes animate in a new way; for ecology is a participatory act. To the dismay of ‘pure science,’ the phenomenologist Maurice Merleau-Ponty writes that “the world is not an object such that I have in my possession the law of its making; it is the natural setting of, and field for, all my thoughts and all my explicit perceptions” (1945 cited in Shotter 2006). This calls for a science where the observer recognizes their place within the ecology of that which they hope to understand. It is a science rooted not in Christianity, nor any defined spirituality for that matter, but is rather a science rooted in relationship—the animated space between things.

Conscious ecological participation, or what I would endeavor to call initiated science, does however not come without a cost. Granting the truth that the observer is both impacting, and being impacted by that which they study, creates several, if not infinite, complications. For one, it forfeits the privilege of universal truth, in that recognizing the unique mesh of relationships, both within time and the physicality of that specific moment, allows for few declarative, omniscient statements to be made. As Laura Sewall states in *The Skill of Ecological Perception*, “context adds a dimension of complexity out of keeping with our desire for fact, or ‘absolute truth’” (1995). This falls in direct opposition to the original intention of Western science, which was to dissect the singular truth out of the natural world, and as Francis Bacon would elicit, “. . . endeavor to establish and extend the power and dominion of the human race itself over the universe” (1620)[Bacon & Fowler 1889]. The implicit function of this initiated science is in some sense a way to re-define what knowledge is; not as a territorial claim, or a flag to be planted into the fertile mystery of nature, but rather as holding knowledge as a practice, as something in itself alive and changing, decomposing and reforming dependent upon the unique circumstances of the moment. In the words of John Shotter:

thus, rather than seeking value-neutral, *theoretical* knowledge of the structure of our shared surroundings as a passive object of thought, which we must then ‘interpret’ as to what its meaning is for us in practical action, we face a different task. Our task is, I suggest, to try to make the ‘being’ of our surroundings, as an active, living agent in our lives, visibly present to us.

(2006)

My inquiry does not aim to disband from the power and necessity of scientific understanding—which I regard as an essential and inevitable aspect of human evolution—but rather, to critically examine the ways in which we engage the knowledge that we’re given. I believe it is precisely the relationships that form out of the initial seeking of knowledge, that are so essential to the ‘coaxing’ of the scientist into their own becoming. I believe this is the

perceptual transformation through which they can begin to see the earth as more than an aggregate of individuals, and even more than as a single being, but as a 'beingness' beyond singular understanding. In orienting to this beingness, they will come face to face with constructs of otherness that earlier science set out to dominate. The very same otherness of a world resplendent in living organisms, whose ways of perceiving the world orbit beyond human cognition. Shotter suggests that "it is only in our ongoing, dynamic, responsive, living relations to the expressions of the others and othernesses around us that a sense of their inner lives can become present to us in our human world." (2006). In essence, the scientific knowledge is determined by the relationship, and the ever-changing permeability of relationship that nature demands.

There is another task, however, beyond Shotter's participative science. It is what allows for the science to initiate the scientist into something deeper. Through releasing the threads of the 17th-century dominion of nature, manifested today through notions of separation from nature, there is the 'stepping-into' of a new sense of self as something beyond the individual. My friend and teacher Joanna Macy calls this the ecological self. She describes how "it can change the way that the self is experienced through a spontaneous process of self-realization, where the self-to-be-realized extends further and further beyond the separate ego and includes more and more of the phenomenal world" (2009). In this sense, the ecology is given voice through relationship with the ecologist, for any 'knowledge' illuminated through an ecological sense of self will inevitably reflect the ecology by which the knowledge was realized. The benefits of that realization will therefore inherently reflect the interest of that ecology, as the knowledge emerged from sensing into the ecological self, or the ecology itself—just as a science based in anthropocentrism will design the benefits of its realizations for the prioritization of humanity, or individualized notions of progress.

An ecological science rooted in humanity as within the Earth, opposed to one perceiving human consciousness as above the Earth, unbound from the Earth, or safe-guarded against the Earth, creates several pronounced variations of understanding. Sewall describes one deviation as “a sense of being within produces a distinct vulnerability” (1995). If, for example, an ecologist expands “the self” beyond their individual ego and into the focus of their study, their own well-being becomes inextricably bound to the well-being of that focus. A few steps deeper, and they are bound to the ecosystem around them, a few steps deeper still, and their sense of well-being unfurls itself to the great intelligence, beauty, sensuality, and destruction of the Earth, for one cannot open to wonder without also opening to grief.

In this sense, today’s science sheds more light, each morning, upon the destruction of the planet. It has provided, with great precision, proof of humanity’s complicity and manifestation of this destruction, cultivated under the guise of development. Despite the ways in which information and proof may illuminate these violations, they have alone not been enough to change the course of things, nor has spiritual belief or ‘consciousness’ alone been enough to penetrate the fabrics of society and economy. For this reason, my support of an alternative approach to science is in reality a deeper calling, among many other voices, for a metamorphosis of the belief system within which Western science operates. In examining the procession of writers and scholars who have carried us through the last several centuries, we can begin to locate ourselves within a great line of perceptual evolution. Many contemporary scientists and philosophers, though far from all, are coming to reside at various though growing degrees of recognized embeddedness, both in thought and physicality within nature, rather than as purely exterior observers. I believe that it is ultimately this holding of ourselves as wedded and entangled within the folds of our research, that we may come to embody the necessary response to what it is that science is truly revealing.



Trochilidae. — Solifbris.

(Trochilidae, Tafel 99, after Haeckel 1904)

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