Art, Nature, and the Poesy of Plants in the *Goethe-Zeit*: A Biosemiotic Perspective[1]

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Sometime around 1800, toward the end of his period of programmatic neoclassicism, Goethe took time out from his official duties at the Weimar court, and from his own scientific research, to compose a perfect Petrarchan sonnet addressed to the relationship between "art" and "nature." While seemingly in flight from one another, we are told in the opening stanza, the apparent divergence of the entities thus named actually effects their unforeseen reunion: "Natur und Kunst, sie scheinen sich zu fliehen, / Und haben sich, eh man es denkt, gefunden" (Though art and nature seem sore disunited / Yet each, before you think, to each is turning).[2] Reassured by this apparent reconciliation of nature and art, the speaker declares that his antipathy (*Widerwille*) (whether to the one or the other or, perhaps, to their apparently antipathetic trajectories) has also disappeared, and he now finds himself drawn equally to both. This bold beginning raises a series of questions, arising in no small part from the multivalence of the very terms "nature" and "art," which are only partially and indirectly answered in the following stanzas. "Nature," as Raymond Williams remarks in *Keywords*, is "perhaps the most complex word in the [English] language," and judging by the lengthy entry in the Grimms' *Deutsches Wörterbuch*, the same can certainly be said for *Natur* in German.[3] One wonders, then, what conception and dimension of "nature" is in play here? "Art" is somewhat less prodigiously polysemous, but it was significantly more so in Goethe's day. While we tend to associate this word primarily with the sphere of aesthetic production, as in the creation of works of art, around 1800, *Kunst*, like "art" in English, could also refer to

activities that would today be classified in terms of "craft." Such crafty "arts" could also include the experimental techniques deployed by those who had adopted Sir Francis Bacon's *novum organon* in order to induce "nature" to surrender "her" closely guarded secrets.[4] What kind of "art" is this, then, that is seemingly so at odds with "nature"? Why are they in flight from one another? And on what basis, and in what manner, might their apparent reunification be effected?In this essay, I propose to explore these questions from an ecocritical and ecophilosophical perspective. In particular, I wish to reconsider German Romantic-era understandings of the interrelationship of art and nature with respect to the burgeoning new field of multi- and interdisciplinary study that became known in the 1980s as "biosemiotics." Biosemiotics entails the examination of those multifarious and multifaceted communicative processes (*semiosis*) that are intrinsic to the existence and interactions of all living organisms (*bios*). Discussions of the historical antecedents of biosemiotics not infrequently allude to the legacy of German Romantic biology and *Naturphilosophie*. Prisca Augustyn, for instance, refers to the "*Romantic Biology* or *natural organicism* of Kant, Goethe, and Schelling that sees nature as creative force and creation at once, where *perfect form* is found in plants and animals as in poetry or art," as the "bedrock of biosemiotic thought."[5] Similarly, Donald Favareau, in his detailed "Evolutionary History of Biosemiotics" acknowledges the importance of German Romantic thought in the intellectual milieu of one of the major forefathers of biosemiotics, the German-Estonian biologist Jakob von Uexküll (1864–1944), and its legacy in his language.[6] Such legacies nonetheless remain underresearched and even appear at times to be a source of concern to contemporary biosemioticians. For example, Tommi Vehkavaraa is at pains to distinguish the account of the continuity between

biological life and human mental activity developed by another biosemiotic forefather, Charles Sanders Peirce (1839–1914), from that of Schelling's *Naturphilosophie*,[7] while Romantic science does not even rate a mention in Favareau's "Brief History of the Sign Concept in Pre-modernist Science," which appeared in the inaugural issue of the journal *Biosemiotics* in 2008.[8] In his "Evolutionary History," moreover, Favareau admits that he doctored a quotation from Uexküll, in which the latter criticizes Darwin's reductive account of causality in his evolutionary theory, by replacing the Estonian biologist's "teleologically 'loaded'" reference to the organism's internal "strive [*sic*] for perfection" with the phrase "component in the active self-organization and creation" of the individual organism.[9] While the contemporary biosemiotician's caution with regard to such teleological assumptions might be well warranted, I suspect that the widespread downplaying and relative neglect of Peirce's and Uexküll's Romantic antecedents might be motivated, at least in part, by prejudicial assumptions, which remain widely held in the English-speaking world in particular but which have been fundamentally challenged by recent revaluations of the thought, literature, and science of the German region around 1800.[10] The primary objective of this essay, then, is to contribute to the as-yet-small body of work that is beginning to explore the Romantic antecedents and affiliations of biosemiotics, in light of some of these important reassessments.[11] Following a brief outline of the biosemiotic project, I will focus on the reconceptualization of the interrelationship between "art" and "nature" that Goethe and some of his contemporaries—in particular, Schelling and, to a lesser extent, the other young Romantics in Jena—were undertaking around 1800. Moving from the terrain of the history of ideas into a more literary-critical mode, I will conclude with a reading of

Goethe's 1798 poem "Die Metamorphose der Pflanzen" (The Metamorphosis of Plants), in which I indicate how a reconsideration of such Romantic-era engagements with the interrelationship between natural becoming and poetic communication might contribute to the aesthetic and ethical elaboration of biosemiotic insights in the present.

Biosemiotics in Brief

Biosemiotics proceeds from the premise that "living nature," as Jesper Hoffmeyer puts it, is "essentially driven by, or actually consist[s] of, semiosis."[12] Among the diverse vehicles of communication that are perpetually composing, recomposing, decomposing, and interconnecting the multifarious life-forms that constitute Earth's biosphere are sound, scent, movement, pressure, texture, taste, and shape, as well as more elusive but nonetheless powerfully efficacious phenomena such as electrical fields and chemical effusions. From a biosemiotic perspective, the whole world—or, rather, all worlds, since, as Uexküll discovered, each organism has its own—is, as Peirce put it, "perfused with signs":[13] from the level of the individual cell, which is obliged to interpret the genome that it contains in order to help build a body within a particular biophysical environment, to that of the literary critic who, perchance, interprets a poem to help build understanding within a particular sociocultural environment. Biosemiotics is a fast-growing field with diverse disciplinary manifestations, ramifications, and cross-fertilizations. Claus Emmeche's succinct definition from 1992 nonetheless still holds good:

> Biosemiotics proper deals with sign processes in nature in all dimensions, including 1) the emergence of semiosis in nature, which may coincide with or

> anticipate the emergence of living cells; 2) the natural history of signs; 3) the "horizontal" aspect of semiosis in the ontogeny of organisms, in plant and animal communication, and in inner sign functions in the immune and nervous systems; and 4) the semiotics of cognition and language.[14]

Biosemiotics proper, as Hoffmeyer observes, was invented independently several times over the latter part of the twentieth century. It is widely accepted, however, that the preeminent figure who "had the broadminded intellect and indefatigable energy to assemble all the threads that would serve as the foundation for the modern biosemiotic project" (Hoffmeyer 364) was the Hungarian-born American linguist Thomas Sebeok (1920–2001), to whom Hoffmeyer's authoritative introduction to the field is dedicated. The two main threads out of which Sebeok wove his synthesis were the "semeiotic" philosophy of American Pragmatist Charles Sanders Peirce and the "*Umwelt*" theory of German-Estonian biologist Jakob von Uexküll, which he explored in depth with Jakob's grandson, the medical researcher Thure von Uexküll.

Sebeok was fascinated by nonhuman-animal and human-animal communication, and in Peirce he found a theory of sign relations that was not restricted to human verbal communication—unlike the semiology of Ferdinand Saussure that was taken up so enthusiastically in French structuralism and poststructuralism, contributing to the pronounced anthropocentrism of the kind of Theory that was so eagerly assimilated into literary and cultural studies from the 1970s onward. In order to advance the theory of "zoosemiotics" that he had already begun to postulate in the early 1960s, Sebeok needed to be able to account for the process whereby animals come to translate corporeal

sensations into meaningful perceptions. It was in the revised second edition (1928) of Jakob von Uexküll's *Theoretische Biologie*, which he read in the original German in 1978, that he found the key: namely, in Uexküll's redeployment of the existing German term *Umwelt* (environment) to designate a species-specific and more-or-less individually nuanced phenomenal world, a world, that is, composed of signs. As Hoffmeyer observes, Uexküll "was working very much within a nineteenth century Romantic intellectual culture that was still vibrant in Estonia, while the science of Darwin's England was increasingly utilitarian, mechanistic and Malthusian" (32). Among his most important influences, moreover, were Schelling's *Naturphilosophie* and the developmental or "epigenetic" biology of Goethe and Karl Ernst von Baer, among others.[17] Uexküll's research into the perceptual worlds of other-than-human animals revealed how every organism's *Umwelt* is borne out of the functionality of its particular bodily constitution and conditioned by its developmental stage and life experience. This is correlated with a mental model of reality, or *Innenwelt*, that determines whether and how any entity that enters an animal's physical environment might become a bearer of meaning—one that the animal will be called upon to interpret wisely in order to interact with it appropriately (e.g., as predator, prey, playfellow, mate, or the source of some other kind of potential trouble, pleasure, or interest). The relationship between an organism and its environment is dynamic, being continuously renegotiated through what Uexküll termed the "Funktionskreis" (functional cycle) of perception and action that "effectively 'couples' the ever-changing system that is the organism to the ever-changing system that is the world" (Favareau, "Evolutionary History," 32). While Sebeok and others have since extended this zoosemiotic line of inquiry, other biosemioticians have gone on to explore

the sign relations that obtain within organisms ("endosemiosis"), among plants ("phytosemiosis"), and even in inanimate nature ("physiosemiosis"). Of particular relevance to this essay is also the nascent field of "ecosemiotics," which encompasses research into human communication with, and about, nature, as mediated through the sign systems of human culture, and which might be considered part of the wider field of environmental (or "ecocritical") literary and cultural studies.[19]

Most biosemiotic research hitherto has been conducted by natural scientists. However, it has also begun to attract the attention of a growing number of researchers in the environmental humanities. It is not hard to see why: by repositioning articulate human language on a continuum with the varied semiotic transactions with which all other organisms are also involved, biosemiotics opens a pathway out of the dead end of human exceptionalism, which is viewed by many ecophilosophers and ecopolitical theorists as contributing to what might well turn out to be a terminal ecological crisis.[20] In addition to restoring communicative agency to nonhumans, moreover, biosemiotics expands our understanding of human sign relations. As "whole creatures," as Wendy Wheeler has it, humans, in common with other animals, also participate in a host of corporeal communications that generally transpire below the level of consciousness.[21] It is for this reason, as Peirce stressed, that we always know more than we think we know. Caught up, as we tend to be, in the world composed by the words that are forever running through our heads, passing out of our mouths, into our ears, or being traced by our eyes or fingertips, much of what we know viscerally, so to speak, does not make it into our field of awareness. Occasionally, though, some of the signs that our mindful bodies are perpetually decoding might be felt in the flesh, such as the approach of a threat whose

source we have not yet identified, or might be intuited as a hunch, which could give rise to one of those creative insights that Peirce termed "abductions."

This is not to say that we would be better off without that world of words, though. On the contrary: biosemioticians view articulate human language as the most complex mode of communication that has evolved thus far on Earth. With growing complexity comes what Hoffmeyer terms increasing "semiotic freedom,"[22] entailing heightened self-awareness, including the ability to recognize, as Kant influentially enjoined us to do, that the world disclosed to us through our ideas, words, and the embodied experiences that they coconstruct does not necessarily correspond to the way things are "in themselves." The geohistorically unprecedented degree of semiotic freedom that humans have acquired along their evolutionary journey has enabled the intergenerational creation, perpetuation, and transformation of symbol-based communal cultures, which, under certain geohistorical conditions, have in turn facilitated the emergence of greater social complexity and the augmentation and acceleration of communication across time and space through the development of new media (from writing to the Internet), thus enabling the creation of new kinds of knowledge, along with enhanced technological capacities.

This growth in semiotic freedom is nonetheless a risky business. For one thing, it goes hand in hand with an ever-expanding margin of potential misunderstanding: while some organisms deploy signs to deceive others (e.g., by puffing up their fur or feathers to appear larger than they actually are), my dogs are rather less likely to misread the chemical signal left by a fellow canine, let alone the sight of its raised hackles, than I am the nuances of any conversation I might have with a neighbor while my dogs and I are out for a walk. In everyday life, the muddles that can arise from the slipperiness of verbal

communication, especially in written form and hence in the absence of invaluable nonverbal signals, can be a real drag. In verbal works of art, however, this very multivalence, or semiotic openness, is the essence of the aesthetic experience. More troublesome, potentially, is a further concomitant of the increased semiotic freedom facilitated by articulate language: namely, the development of a certain alienation from our own corporeal being and sensory perceptions and, potentially, from other beings (especially other-than-human ones) and from the natural world more generally. Once inducted into the world of words, and hence into a particular cultural formation, our own naturality can no longer be taken for granted, becoming instead something with which we are obliged to entertain a relationship, rather than something that prescribes what we are and might become. This implies also that as linguistically enculturated creatures, the recognition of our corporeal, or psychophysical, interconnectedness with other creatures and our earthly environs does not simply come naturally: paradoxically, the recognition of our own naturality, along with our connectivities with nonhuman others, is necessarily a cultural achievement.[23] Societies vary significantly in this respect, and one of the distinguishing features of Euro-Western culture, as noted previously, has been the predominance of dualistic discourses of human exceptionalism, often grounded in claims about language and reason as opposed to, and elevated above, the merely material realm of nature. Such discourses have tended to hinder the recognition of the naturality of human beings, with increasingly catastrophic socioecological and ecoethical consequences.[24] Here too, though, it is the heightened self-reflexivity afforded by greater semiotic freedom that facilitates this kind of cultural critique, along with the attendant possibility of consciously cultivating more ecological and ethical modes of engagement

both with our own creatureliness and with other creatures and our earthly environs. It is just such a deployment of the multivalent language of written poetry to reconnect human mental and moral life with the biosemiotic becoming of other living entities that I trace below in Goethe's "Metamorphose der Pflanzen."

As I see it, then, the biosemiotic pathway out of human exceptionalism is particularly appealing because it does not propel us into the counterposed cul-de-sac of denying human peculiarities, including the stupendous peculiarity of articulate speech and all that this enables. In the face of deepening socioecological damage and disorder, we will need to bring into play our human peculiarities no less than our creaturely connectivities in redressing these problems, as graciously, courageously, and creatively as we can. It is widely accepted that this current crisis was set in train as an unintended consequence of those technoscientific advances, facilitated by our semiotic freedom in conjunction, of course, with our niftily opposable thumbs, that go by the name of the Industrial Revolution. The beginnings of the calamitous Anthropocene, when humans began to emerge as a geological force on a whole new scale through their use of fossil-fuel combustion, can be dated to the late eighteenth century.[25] But so too can that ferment of conversation, reflection, and writing on human language and creativity and its relationship to the "poesy" and "productivity" of more-than-human nature that, as I hope to indicate here, not only forms a key moment in the prehistory of biosemiotics but also has much to contribute to contemporary ecosemiotic research and reflection.

Art and Nature in Weimar and Jena c. 1800: Toward Biosemiotics

Let me begin this consideration of the Romantic antecedents of biosemiotics by returning to the sonnet with which I began. The semantic amplitude carried by the key terms of "art" and "nature" that I noted with respect to the opening stanza is partially pared back as the speaker proceeds to exemplify their reconciliation in the second:

> Es gilt wohl nur ein redliches Bemühen!
> Und wenn wir erst in abgemeßnen Stunden
> Mit Geist und Fleiß uns an die Kunst gebunden,
> Mag frei Natur im Herzen wieder glühen. (MA 6.1:780)
> [An honest effort's bound to be required!
> If measured hours we dedicate to learning
> And bind ourselves to art with zeal discerning
> The heart may glow with nature new ignited.]

Here, *Kunst* is configured as an activity that demands regular periods of dedicated labor, conjoining mental or spiritual gifts (*Geist*) with diligent application (*Fleiß*), such as that which might be required, for instance, in the verbal crafting of a Petrarchan sonnet, as well as in innumerable other forms of disciplined creative endeavor (including, potentially, scientific ones). As that which "frei im Herzen glüht" (freely glows in the heart) following these hours of painstaking effort, the initially wide-open semantic field of *Natur* has been contracted down to that of "inner nature," evidently denoting the subject's "natural" tendencies, drives, or inclinations. This qualification nonetheless opens further questions regarding the precise relationship between the "redliches

Bemühen" ("honest effort" or "toil") demanded by artistic endeavor and that which sets the subject's heart alight. Is this simply a matter of accepting the bourgeois dictum of work before pleasure? I think not. The rhymed pair that frames this stanza (*Bemühen-Glühen*) suggests a more intrinsic relation, implying that the natural inclination that is assumed here is one that seeks satisfaction through the very process of poiesis: that it is of the nature of the subject (whether understood narrowly qua artist/craftsman or, more inclusively, qua human being) to desire, and to be enlivened by, the work of making things, of poietic practice, verbal or otherwise.

Following the semantic contraction of the second part of the octave, the "volta" brings a renewed expansion, and further complexities. The opening line of the third stanza offers a generalization that is often seen as pertaining to the sphere of specifically human activity considered thus far under the rubric of *Kunst*: "So ist's mit aller Bildung auch beschaffen" (So too all forming culture needs some tether). This association is implicit, not only in Whaley's translation, given in parentheses above, but also, for example, in David Luke's, which reads: "All culture is like this."[26] All translations presuppose interpretation, of course, but in these instances, the interpretive choice drastically narrows the denotation of the German word, *Bildung*, which in turn limits the connotations of the poem as a whole. For in Goethe's lexicon, *Bildung* is by no means restricted to human culture but can be observed also in the formation of all those natural phenomena—from solar systems to the tiniest of Earth's living organisms, to the amorous gaze that the poet imagines being shared between the earliest of our human ancestors—that he celebrated in another poem of this period, "Die Weltseele" (The World Soul). As he observed in one of his "Maxims and Reflections," with reference to the metamorphic

process of crystallization in the mineral realm, "Die schönste Metamporphose des unorganischen Reiches ist, wenn beim Entstehen das Amorphe sich ins Gestaltete verwandelt. Jede Masse hat hiezu Trieb und Recht" (MA 17:928; Every material has the right and inclination" to take "a structure as it comes into being).[27] In nature, then, no less than in art, the emergence of distinct entities with a determinate form involves the delimitation of the boundless: the refusal of all limits thus impedes the realization of that "Vollendung" ("perfection" or "completion") toward which the poet presumes both human making and natural becoming aspire.

In order to contextualize this leap from the apparent polarity of art and nature to their common ground in those more-than-human formative processes signified by *aller Bildung*, it is pertinent to recall that "Die Weltseele" was written in response to Schelling's 1798 philosophical work of that name, *Von der Weltseele—Eine Hypothese der höheren Physik zur Erklärung des allgemeinen Organismus*, of which Goethe had received an advance copy. It was evidently his enthusiasm for this work, in conjunction with his personal liking for the charming young philosopher, that motivated Goethe to accede to Niethammer's and Schiller's request that he support Schelling's appointment to a professorship at the University of Jena (Richards 148). Goethe was no doubt gratified to note that Schelling used Goethe's own studies of morphology and optics in this work. One can also assume that Goethe approved strongly of Schelling's move away from the Fichteanism of his earlier *Ideen zu einer Philosophie der Natur* (Ideas toward a Philosophy of Nature, 1797), which is primarily concerned with nature as conceived by the human mind, and toward a consideration of those observed processes of natural becoming of which the human mind could now be understood as itself a product: a move

that is made more decisively in his *Erster Entwurf eines Systems der Philosophie der Natur* (First Projection of a System of the Philosophy of Nature) and the subsequently published (1799) *Einleitung* (introduction) thereto, which were profoundly indebted to Schelling's conversations with Goethe, following Schelling's move to Jena in mid-1798 (Nassar, *Romantic Absolute*, 193–95).Schelling's mature philosophy of nature broke not only with Fichtean transcendental reasoning but also with the reductive view of matter associated with Newtonian atomism and Cartesian dualism and mechanism. In countering the construction of matter as inert and devoid of any kind of interiority, Schelling is widely seen as drawing on, as well as significantly modifying, Leibnizian vitalism, Spinozan monism, and Neoplatonic emanationism. But as becomes evident from the wealth of recent research cited in *Von der Weltseele*, advances in the empirical study of physical phenomena also pointed to the apparent insufficiency of a purely mechanistic and atomistic view of matter: Newton himself had admitted that he could not fully account for the phenomenon of gravity in those terms, and as Kant had already posited in his essay "Metaphysische Anfangsgründe der Naturwissenschaft" (Metaphysical Foundations of Natural Science, 1786), current findings in the sexy new fields of galvanism, magnetism, and chemistry were suggestive of a self-organizing tendency within matter itself, which appeared to arise from the dynamic interplay of counterposing forces.[30] It was, however, above all, contemporary research into the even more remarkable phenomenon of life—which appeared so resistant to mechanistic determinations that Kant had declared it off-limits to scientific investigation[31]—that inspired Schelling's modern reconceptualization of Spinoza's *natura naturans* (nature naturing) as an immanent principle of purposive self-organization and dynamic self-

transformation within the temporal becoming of the natural world as a whole, which could now be reconceived as a meta-organism (*allgemeiner Organismus*), of which human consciousness too was integrally a part. According to the wholly immanental theory of dynamic evolution advanced in *Von der Weltseele*, then, life is not infused into matter from outside, but rather matter itself had acquired life with the emergence of organic forms: "Das Prinzip des Lebens . . . hat *sich* die organische Materie *angebildet*" (Organic matter has *formed within itself* the principle of life; emphasis in original), implying that the potential for the emergence of living organisms is inherent in nature.[32] Similarly, human consciousness was not infused into organic matter from outside, but could now be understood as having emerged through an evolutionary process, which, in the *Erster Entwurf* and the *Einleitung,* Schelling attributed to the dynamic interplay of generative and inhibiting forces within the infinite "productivity" of natural becoming.[33] There was, therefore, a real (as opposed to an ideal or transcendental) continuity between inorganic and organic matter and between organic life and human consciousness: all things, moreover, remained interconnected within that "gemeinschaftliches Medium" (*W* 257; common medium) that Schelling had previously troped under the ancient name (with more recent Neoplatonic resonances) of the "world-soul" but that could now be understood as inherent to matter itself in its creatively self-organizing and dynamically self-transforming dimension of *natura naturans*.[35]Read intertextually with Schelling's mature *Naturphilosophie*, then, it becomes possible to understand the reunification or reconciliation of art and nature that is at once proclaimed and instantiated by Goethe's sonnet as a matter not only of analogous formative processes—the acceptance of limitation—but also of evolutionary emergence. It is precisely in these terms—

encouraged, no doubt, by Schelling's contributions to the soirees then being hosted by Caroline Schlegel—that Friedrich Schlegel writes of human artistic, and especially literary, creativity in his *Gespräch über die Poesie* (Conversation on Poesy), published in 1800: namely, that it is dependent upon, and indeed grows out of, the prior "formlose und bewußtlose Poesie" (unformed and unconscious poesy) of the living earth, of which we are ourselves a "Blüte" (bloom, my trans.). This primal poesy, "die sich in der Pflanze regt, im Lichte strahlt, im Kinde lächelt, in der Blüte der Jugend schimmert, in der liebenden Brust der Frauen glüht" (which stirs in the plant and shines in the light, smiles in a child, gleams in the flower of youth, and glows in the loving bosom of women), Schlegel avers, has always been humanity's privileged "Gegenstand und . . . Stoff aller Tätigkeit und Freude" (object and source of activity and joy). The human capacity to "Die Musik des unendlichen Spielwerks zu vernehmen, die Schönheit des Gedichts zu verstehen, sind wir fähig, weil auch ein Teil des Dichters, eine Funke seines schaffenden Geistes in uns lebt und tief unter der Asche der selbstgemachten Unvernunft mit heimlicher Gewalt zu glühen niemals aufhört" (hear the music of the unceasing action" (my trans.) of natural becoming, and "to understand the beauty of [this] poem" arises because we are ourselves "a part of the poet, a part of his creative spirit lives in us and never ceases to glow with secret force under the ashes of our self-induced unreason").[36] For the young Schlegel, at the height of his Romantic avant-gardism, this poetic deity (*Gottheit*), like Schelling's "world soul," was located within nature, which Schlegel too had come to understand as a creatively self-organizing and dynamically self-transforming meta-organism.[37]Schelling, for his part, was inspired by his conversations with Schlegel's group, as well as with Schiller and Goethe, to broach the question of the relationship

between artistic creation and natural becoming along new lines in his *System des transzendentalen Idealismus* (System of Transcendental Idealism), also published in 1800. Here, the opposition between the "unconscious" poesy of (nonhuman) nature and the intentionality of human artistic formation implicit in the opening effusion of Schlegel's *Gespräch* finds a remarkable resolution: namely, in the idea that the work of art is, in fact, not a purely intentional creation but rather emerges from the interplay of "unconscious" urgings and conscious crafting. In Richard's gloss, Schelling's argument runs like this:

> Insistent forces thus well up from the unconscious nature of the artist and rush in turbulent cascades through the narrows of consciousness. This creates . . . violent eddies of contradiction that "set in motion the artistic urge." Such contradictions can only be calmed in the execution of the work of art. As the artist comes to rest in the finished, objective product, he or she will sense the union of nature and self, or necessity and freedom, of—finally—the unconscious and the conscious self. (162)

This in turn opens a further perspective on Goethe's sonnet. Whether or not he penned this poem after he had read his advance copy of the *System*, of which he commented in a letter to its author in September 1800 that he was "decisively inclined towards your doctrine,"[39] it is noteworthy that the reunification of art and nature announced in the opening stanza is said to have occurred prior to reflection: "eh man es denkt." Read intertextually with the *System*, this could be seen to suggest that the inner glow that the subject is said to experience following her or his artistic exertions in the

second stanza arises not only from the outlet provided to the generalized urge to create that is evidently part of our evolutionary inheritance as *homo faber* but also because the product of this conscientious labor provides an at-least-partial materialization of those specific unconscious feelings that fed into its creation. As we have seen, in Goethe's version of dynamic evolution, the emergence of organized forms in nature, as in art, is dependent upon limitation: specifically, the interplay of expansion and constraint that propels the process of differentiation and augmentation (*Steigerung*), which is here referred to as the quest for perfection, and that is denied to those who instead aspire to boundlessness. The explicit conclusion, then, reads: "In der Beschränkung zeigt sich erst der Meister / Und das Gesetz nur kann uns Freiheit geben" (Constraint is where you show you are a master / And only law is freedom's sure foundation). Since, however, Goethe, not unlike the Schelling of the *Erster Entwurf*, accepts that the "pure heights of perfection" represent a goal toward which we can but strive (*streben*), without necessarily ever reaching this exalted destination, new living organisms and forms of life are forever coming into being, and no one poem can ever give the final word: art and nature are therefore linked also in their inevitable failure to render the unconscious fully conscious or to fully materialize the absolute. But it is this very inadequacy that makes them an ongoing concern: just as, from the rather-dire perspective of the *Erster Entwurf*,[40] the engendering of the absolutely perfect organism would bring evolution to a standstill, so too, the crafting of the absolutely perfect poem would imply the end of art.

While the reconceptualization of human consciousness and, hence, of the "poesy of words" as an outgrowth of the autopoiesis of the living Earth, implies a broadly evolutionary perspective, Schelling moves toward a specifically biosemiotic insight in his

identification of the role of the unconscious in the creative process, as well as in his discussion of "ästhetische Anschauung" (aesthetic intuition) and its place in both philosophical illumination and scientific discovery, to the extent, namely, that these processes involve what Peirce termed "abduction." Such intuitions are in play, Schelling suggests, when an idea impresses itself upon the mind before one has grasped what it means or how it has been arrived at, or when a sense of the whole has been glimpsed prior to the analysis of the parts that constitute the phenomenon in question.[41] It is the "Dichtungsvermögen" (poetic capacity) that enables these kinds of intuitions to find their initial articulation in figurative language: metaphor, in this sense, constitutes a bridge whereby that which is as yet unknown enters into the sphere of the known. As Wheeler has observed, Schelling's theory of the creative agency of metaphor (and, I would add, aesthetic intuition more generally) can be seen as a significant precursor to the Peircean notion of abduction: that is, the process whereby signs that have been registered and associations that have been made below the level of consciousness by the *Umwelt*-aware embodied mind give rise to insightful new "hunches."[42]But what of the biosemiotic consideration of communication within and among other-than-human organisms? The idea that language extends beyond the human plays an important role in German Romantic thought and literature in the guise of the topos of "natural language" or the "language of nature" (*Natursprache*): a concept that enters Romanticism via Franz Baader's, J. G. Hamann's, and J. G. Herder's reception of Paracelsus and Jakob Böhme, with links to earlier, especially Neoplatonic, notions of the "Book of Nature."[43] This lineage is apparent, for example, in Novalis's notes for his counter-*encyclopèdie*, *Das allgemeine Brouillon* (1798/99), when he asserts, "Der Mensch spricht nicht allein—auch

das Universum spricht—alles spricht—unendliche Sprachen. Lehre von den Signaturen" (**need translation),** in a clear allusion to Paracelsus's "doctrine of signatures."[44] As Axel Goodbody observes in what remains, to my knowledge, the only book-length study of this key Romantic topos, the question of *Natursprache* figures significantly in three main fields of inquiry (which not infrequently overlap in particular instances): theologically, it concerns the relationship between God and creation; philosophically, it concerns the relationship between mind and matter; and poetologically, it concerns the relationship between poetic language and natural symbols (Goodbody, *Natursprache*, 13). Goodbody's primary interest in this pre-ecocritical study[46] is with the aesthetic implications of the discourse of *Natursprache*, especially as it figures in the work of Novalis and Eichendorff and returns in modernist guise in the poetics of Wilhelm Lehmann and Günther Eich. During the Romantic period, the primary poetological deployment of the *Natursprache* topos construes the natural world as a hieroglyphic script, comprising a network of symbolic associations, which can be disclosed only in the noninstrumentalizing language of poetry, which is itself understood as aspiring to reunite signifier and signified through its use of natural symbols. It is in this sense that Schelling too observes in the *System* that "Was wir Natur nennen, ist ein Gedicht, das in geheimer wunderbarer Schrift verschlossen liegt" (628; what we call nature is a poem that is enclosed in a secret, wondrous script). The symbolic meanings that emerge from the aesthetic contemplation of nature are no longer held to be fixed (as in earlier versions of the Book of Nature), implying that their interpretation is potentially endless. Even so, these meanings were not taken to be entirely arbitrary, to the extent that they were held to arise from the hidden interconnectivities that, pace Schelling, obtained among natural

phenomena as well as between humans and nature at a corporeal and largely unconscious level.

As Jörg Zimmermann (244) has observed, the Romantics held that the "voice" of nature became audible only when natural phenomena were viewed as subjects in their own right; and it became comprehensible only to those human subjects who recognized themselves as part of nature. In this respect, the *Natursprache* topos was clearly pitched against mechanistic, dualistic, and instrumentalist approaches to the natural world. What remains occluded here, though, is the possibility that other-than-human entities are engaged in their own communicative exchanges, regardless of what we make of them. In order to pursue this question it is necessary to consider that aspect of the *Natursprache* topos that Goodbody leaves aside: namely, its links to Romantic natural philosophy and natural history. This is a big project, and one that I can make only a modest start on here; I will do so by returning to Schelling's *Weltseele.* The exemplar that Schelling provides as evidence for the "common medium" interconnecting all natural phenomena at the end of the *Weltseele* is the observed behavior of those animals who become visibly distressed immediately prior to the occurrence of large earthquakes: it is, he writes, "as if the same cause, which shatters mountains and raises islands out of the sea, also moves the breathing breast of animals" (*W* 257). There is now considerable empirical support for this phenomenon, which provides an intriguing instance of those zoosemiotic processes that are just beginning to be rigorously investigated. With respect to the living world, moreover, it is tempting to argue that Schelling's "common medium" is nothing more, nor less, mysterious than the communicative matrix of biospherical semiosis. This is not a possibility that he pursues here though, preferring to look for an immanental, if

"ethereal,"[50] universal connection instead of considering the existence of particular communicative media, such as those that evidently enable certain other species to pick up atmospheric, haptic, or auditory signs of an imminent earth movement that human senses are too dull, or too dulled, to discern and decode. In his earlier discussion of animal *Erregbarkeit* and *Sensibilität* ("irritability" and "sensibility"), Schelling does nonetheless move in a distinctly biosemiotic direction, namely, in his prefiguration of Uexküll's examination of the way in which each organism perceives its species-specific *Umwelt*.In the biology of his day, these were two of the three primary modes of "excitability" that were seen to be characteristic of all life, the third being "reproduction" (including growth, maintenance, self-repair, and drives, in addition to the generation of individuals of like kind). "Irritability" referred to physiological responses to external stimuli, such as the contraction of muscles, changes in the movement and constituents of bodily fluids, and alterations to the action of inner organs (i.e., similar to what would now be referred to as autonomic nervous system reactions). "Sensibility" was connected with "irritability" but referred to the ability to make and retain impressions of external stimuli—to interpret them, as it were, if not necessarily consciously. The kinds of sensible impressions thus formed, moreover, were in turn related to an organism's particular corporeal organization, its physical form, and, hence, its psychophysical capacities, impulses, and orientations. What Schelling refers to here as an animal's "Sphäre eigenthümlicher Eindrücke" (*W* 248; sphere of characteristic impressions), I would suggest, constitutes an important precursor to Jakob von Uexküll's notion of the animal's "inner world," the semiotic bubble through which it construes and negotiates its *Umwelt*. The signs that an animal registers as significant through, for instance, its faculties of sight and hearing, Schelling

goes on to argue, are conditioned by its innate inclinations—its *Instinkt* (*W* 249; instinct). Somewhat surprisingly, he observes that humans too see and hear only that "wozu er zu erkennen *Trieb* hat" (*W* 250; which they are inclined, or impelled, to recognize, emphasis in original). This, however, he designates as a "higher instinct," which, when directed toward that which is great and beautiful, is called "genius" (*W* 250).It is important to stress that Schelling's commitment to reconnecting human consciousness and creativity with the more-than-human realm from which we had been summarily severed within Cartesian dualism, and from which we remained estranged within Kantian criticism, and which, worse still, was effectively obliterated as an independent entity within Fichtean Idealism, did not imply the negation of human freedom. This is now reconceived, however, as a potential that has arisen out of a temporal process of development that had given rise to increasing levels of organization in the living world: what biologist and protoevolutionary thinker Karl Friedrich Kielmeyer, one of Schelling's major sources (and, subsequently, his son's professor), termed the organizational sequence, or *Organisationsreihe* (Richards 247). In this way, as Frederick Beiser has observed, Schelling's *natura naturans*, unlike Spinoza's, which was static and eternal and manifested equally in all natural entities, is seen to have produced something that is reminiscent of the old medieval hierarchical "Great Chain of Being," with humans at the top.[52] With the emergence of human consciousness, then, Nature acquires the capacity to reflect upon itself. There is, no doubt, a moment of humanist hubris here, but it is qualified by the recognition not only of human dependence upon the prior and ongoing processes of natural becoming but also of the untranscendable limits of human knowledge. If we are ourselves a part of nature, we can never step outside it to know it as

a whole; and since, according to Schelling's holistic thinking, the individual parts acquire their full meaning and significance only in relation to this elusive whole, any understanding that we form of them will necessarily be partial. Not only does this imply that nature can never be fully transparent to human reason, but Schelling also came to accept (in company with the young Romantics in Jena, and contra Fichte) that reason could not be self-grounding.[53] There is nonetheless no doubt that Schelling accorded humans an exalted place in the scheme of things: for with the emergence of human language and consciousness, the creative freedom that Schelling attributes to *natura naturans* is raised to what he came to term a new "potency," with the process of artistic creation as the privileged locus for the reunification, on a higher level, of mind and matter that had always been implicit in natural becoming. As Schelling avers in the *System*, "jede Pflanze ist ein Symbol der Intelligenz" (490; every plant is a symbol of intelligence). But in the verbal symbols of a poetic work of art, the inherent intelligence of a plant might be disclosed in a whole new light, as I indicate below with regard to Goethe's "Metamorphose der Pflanzen."

Ecosemiosis in the "Metamorphosis of Plants": Toward an Ethics of Communicative Co-becoming

If, as Richards observes, the conclusion of Schelling's *System*—not unlike the figure of Ludovico in Schlegel's *Gespräch*—prefigures a "new poetics of nature that would explicitly unite the scientific and the aesthetic" (164), then Goethe's poetic reformulation of the scientific observations on the "metamorphosis of plants" (1790) that he had undertaken in 1798 could be seen to answer the philosopher's call before it had

been penned. Inspired in part by the negative example of Erasmus Darwin's aesthetically infelicitous *Botanic Garden* (1789), this poem, together with "Die Metamorphose der Tiere" (The Metamorphosis of Animals, 1799/1800), was conceived as part of a longer work that Goethe was considering writing at this time, a work along the lines of Lucretius's *De rerum natura*, which his friend Knebel was translating.[56] Although composed in classical elegiac couplets and subsequently placed among his "elegies," "Die Metamorphose der Pflanzen" reads more like an idyll and is, in Nicholas Boyle's view, "one of Goethe's happiest poems" (676). It does nonetheless incorporate an elegiac note in the exclamation that punctuates the seventh line and runs over into the eighth: "O könnt' ich dir, liebliche Freundin, / Überliefern sogleich das lösende Wort!" (MA 6.1:14; O could I, my dearest companion, / Give you one happy word apt to resolve all at once!, 77). The use of the subjunctive here indicates a crucial limitation in the project that the poet is undertaking, pointing to the impossibility of affording his beloved interlocutor an unmediated and complete understanding of nature's "heiliges Rätsel" (holy secret) in the face of her perplexity before the profusion of plants and their foreign (Latin) names. This limit is not only linguistic—the lack of a verbal formula to resolve the mystery—but also epistemological and even, perhaps, ontological. Goethe, at Schiller's urging, had absorbed enough Kant to recognize, as he put it in another of his maxims and reflections, that "Die Erscheinung ist nicht vom Beobachter losgelöst, vielmehr in die Individualität desselben verschlungen und verwickelt" (MA 17:928; the manifestation of a phenomenon is not detached from the observer—it is caught up and entangled in his individuality, Goethe, *Scientific Studies*, 307). This leads him to develop a hermeneutically inflected philosophy of science, encompassing a self-reflexive moment that he identified in the

preface to his *Farbenlehre* (Theory of Color, 1810) as "ironic" (Goethe, *Scientific Studies*, 159; MA 10:11).[60] In the poetic rendering of his observations on the metamorphosis of plants, however, this self-reflexive moment is, to use Schelling's terms, raised to a new potency, through the disclosure of the situatedness of the speaker's botany lesson in the amorous relationship with his interlocutor. Through his ecosemiotic use of poetic language, moreover, the speaker inducts his beloved into the kind of ""zarte Empirie" (MA 17:823; delicate empiricism) referred to in one of Goethe's *Maximen und Reflexionen*, by engaging her empathetic interest in the inherently relational and communicative life of the growing plant, perceived as a subject with its own distinctive way of being and becoming. As Gernot Böhme observes in his landmark reading of the poem in the horizon of ecological aesthetics, Goethe's elegy enacts a way of knowing nature that entails the recognition of human kinship with other-than-human beings.[61] At the same time, though, the text deploys the heightened semiotic freedom that is specific to human language and integrally related to our capacity to grow in understanding of, and ethical responsiveness toward, our Earth others.

As in his essay, so here too, Goethe's poet-scientist explains that the unifying principle of all plant life can only be apprehended if the "Urpflanze," or archetypal plant, is understood as a temporal process of becoming rather than as something that can be perceived directly in an individual plant at any one point in its metamorphosis. Following his elegiac acknowledgment of the inevitable inadequacy of his response to his interlocutor's call, the speaker therefore proceeds to appeal to her imagination—and, implicitly, to that of the reader—in interpreting the "letters" of the divine creatrix (i.e., *natura naturans*) by observing the stages of plant growth and reproduction as rendered in

his verbal explanation. What is particularly striking about this poetic account of plant metamorphosis, when viewed from a biosemiotic perspective, is the way in which it gestures toward some of the sign relations that are specific to the life of plants. Among these are the discernment of moisture, which prompts the seed to germinate, sending its branching rootlets deeper into the earth, and of the light, toward which the growing seedling will gravitate, as well as the color of its foliage and fruit and the fragrance of its flowers, by means of which plants signal to potential pollinators and seed dispersers. Goethe could not have recognized the role of sap in those endosemiotic processes that facilitate plant growth and reproduction; nor could he have known of the importance of chemical signaling in the plant's communication with sundry others, such as fungal symbionts in the soil, other plants, insect predators, and, if it is lucky, the other critters that some plants call upon to prey upon their predators.[62] In his choice of verbal constructions, Goethe nonetheless implies that these processes cannot be understood adequately within a narrowly mechanistic framework: that the plant has a degree of semiotic agency is suggested, for example, in its "sich vertrauend" (entrusting itself) to the moisture that it discerns, as well as in the "Reiz" (attraction) that it can be trusted to feel toward the light:

> Werdend betrachte sie nun, wie nach und nach sich die Pflanze,
>
> Stufenweise geführt, bildet zu Blüte und Frucht.
>
> Aus dem Samen entwickelt sie sich, sobald ihn der Erde
>
> Stille befruchtender Schoß hold in das Leben entläßt,
>
> Und dem Reize des Lichts, des heiligen, ewig bewegten,

Gleich den zärtesten Bau keimender Blätter empfiehlt.
Einfach schlief in dem Samen die Kraft; ein beginnendes Vorbild
Lag, verschlossen in sich, unter die Hülle gebeugt,
Blatt und Wurzel und Keim, nur halb geformet und farblos;
Trocken erhält so der Kern ruhiges Leben bewahrt,
Quillet strebend empor, sich milder Feuchte vertrauend,
Und erhebt sich sogleich aus der umgebenden Nacht. (ll. 9–20)

[Watch as it comes into being, see how the plant through progression,
Guided step-wise along, forms into flowers and fruit.
It develops at once from the seed as soon as the quiet
Life-giving womb of the earth bids it go free into life
And to stimulant light, the sacred, for ever in motion,
It trusts the delicate work of making the burgeoning leaves.
Simple the force asleep in the seed; and incipient model
Lay, enclosed in itself, curled up there under the sheath,
Leaf and rootlet and bud, only half-formed with no colour;
Thus the kernel sustains tranquil life in the dry,
Straining upward it swells, on gentle moisture relying,
Quickly lifting itself from the encompassing night.]

The metamorphic trajectory that the poet-scientist traces in the plant is also said to figure in animal, as well as in human, life. At this point, the process of plant growth and

flowering, which culminates in the union of sexed parts in pollination, leading to the production of seed-bearing fruits, metamorphoses into a metaphor for the blossoming and generative relationship between the speaker and his interlocutor. This shift in turn invites a figurative rereading of the preceding narrative, which thereby acquires some decidedly erotic connotations. The "manchem Geschlecht" referred to in line 30, for example, at which the interlocutor is said to be "zum Erstaunen bewegt" (astounded) when it has completed its first phase of growth, literally denotes many a "kind" of plant. But the stem that is described in the following lines as "Viel gerippt und gezackt, auf mastig strotzender Fläche, / Scheinet die Fülle des Triebs frei und unendlich zu sein" (ll. 31–32; Much serrated and ribbed, on gorged and swelling surface, / Now the abundance of thrust seems to be endless and free) is also somewhat suggestive of the *Geschlechtsteil* of the speaker, which we might be tempted to imagine was similarly engorged, thrusting, and, perchance, astounding, under the influence of the attraction that first brought him together with his interlocutor. In this way, Goethe makes the most of those distinctively human semiotic freedoms that are associated with the multivalence of verbal, especially poetic, communication, even while he affirms, on both the literal and figurative level of the text, the continuity between human and other forms of life. By the same token, the reining in of the outward thrusting force that propels the plant into its next phase of development, and toward even greater perfection, finds an implied analogue in the ethical constraint that facilitates the metamorphosis of raw sexual appetite into respectful love for the other. As Boyle observes, in Goethe's depiction of human becoming-with-others, the metamorphic agency of *natura naturans* does not end with sexual differentiation and reproduction but extends into the cultivation of Kant's "kingdom of ends" (676). In the

case of the speaker and his interlocutor, moreover, the fruit of their maturing bond is a deepening of their shared regard for other living beings: "Die heilige Liebe / Strebt zu der höchsten Frucht gleicher Gesinnungen auf, / Gleicher Ansicht der Dinge, damit in harmonischem Anschaun / Sich verbinde das Paar, finde die höhere Welt" (ll. 77–80; "For love ever sacred aspires / To produce in like minds fruit of the highest degree, / In a likeness of view so in harmonious vision / Joined the pair may unite, rise to that high other world). Yet the shift to the conditional in the final couplet, echoing the use of the subjunctive in the earlier elegiac exclamation, hints at the uncertainty of this outcome: human consciousness might be a product of natural processes; but the creation of loving human interrelationships that are conducive to the flourishing of more-than-human life is necessarily also a cultural achievement (entailing, moreover, the acceptance that not all will share "a likeness of view"), and one that is by no means guaranteed:

> Freue dich auch des heutigen Tags! Die heilige Liebe
>
> Strebt zu der höchsten Frucht gleicher Gesinnungen auf,
>
> Gleicher Ansicht der Dinge, damit in harmonischem Anschaun
>
> Sich verbinde das Paar, finde die höhere Welt. (ll. 78–80)

> [Also rejoice in this day! For love ever sacred aspires
>
> To produce in like minds fruit of the highest degree,
>
> In a likeness of view so in harmonious vision
>
> Joined the pair may unite, rise to that high other world.]

Goethe departed from the "pansemiotic" proclivities of the younger Romantics, for whom, as Novalis put it, "everything speaks," in his dawning recognition of some of the particular ways in which organic entities communicate.[64] For Goethe, rocks, for instance, were "stumme Lehrer" (MA 17:849; silent teachers), while living things alone were truly "speaking."[65] Goethe nonetheless maintained that physics, and presumably also geology, no less than the life sciences, "mit allen liebenden, verehrenden, frommen Kräften in die Natur und das heilige Leben derselben einzudringen suchen" (MA 17:824; must use all its powers of love, respect, and reverence to find its way into nature and the sacred life of nature, *Scientific Studies*, 310). Later physicists would have done well to take this to heart, had they wished to avoid becoming "Death, the destroyer of worlds," to recall Robert Oppenheimer, quoting the words of Shiva in the wake of the detonation of the first atomic bomb. In this spirit, Goethe observes in the preface to the *Farbenlehre*: "No one who is observant will ever find nature dead and silent." In addition to its visual and aural communications, "So spricht die Natur hinabwärts zu andern Sinnen, zu bekannten, verkannten, unbekannten Sinnen, so spricht sie mit sich selbst und zu uns durch tausend Erscheinungen. Dem Aufmerksamen ist sie nirgends tot noch stumm" (MA 10:9; [nature] speaks to other senses which lie even deeper, to known, misunderstood, and unknown senses. Thus it converses with itself and with us through a thousand phenomena, *Scientific Studies*, 158).The burgeoning field of biosemiotics is beginning to disclose some of these hitherto "unknown senses," which turn out to include the chemical receptors and affectors by means of which plants grow, reproduce, and converse with other biota. In this way, biosemiotics invites us to leave our lonely self-imposed exile and rejoin the chorus of living beings from which Baconian man had departed in his bid for

godlike mastery, as the assemblage of imaginatively reanimated natural entities reduced to experimental objects complain in Novalis's *Lehrlinge zu Sais* (Apprentices of Sais, 1802).[68] Ironically, however, the biosemiotic rediscovery that as living organisms we never ceased to be participants in a more-than-human choir is occurring at a time when many other-than-human voices are either being drowned out by the racket of our machines or extinguished forever as a consequence of the seemingly ecocidal socioeconomic trajectory that is fast going global. At this critical, perhaps even kairotic juncture, we therefore need to attend to the ecosemiotic witness of those artists and writers who are capable of engaging our empathetic responsiveness and ethical regard for more than only human others, as I believe Goethe succeeds in doing in "Die Metamorphose der Pflanzen" (and not only there). At the same time, those of us who are scholars in the humanities would do well to join in conversation with those natural scientists who have such wondrous things to tell us about the heteroglossic forms of communication through which Earth's poesy finds material articulation. In so doing, we would be picking up the thread of those multifaceted conversations among poets, philosophers, historians, scientists, theologians, and (recalling the remarkable Humboldt brothers) linguists and geographers that were taking place in Germany around 1800, only to be rudely interrupted by the disciplinary divides of the modern constitution of knowledge: a rupture that continues to impede the kinds of multifaceted responses demanded by the pressing socioecological problems of our day.

[1] This article arose out of a paper that I presented at a symposium, "Nature and Culture in German Romanticism," at the University of New South Wales and the University of Sydney, coconvened by Heikki Ikäheimo, Dalia Nassar, and Paul Redding in March 2014. I am grateful for the opportunity to participate in this event, as well as to other participants for their questions and comments, especially Dalia Nassar, Richard Eldridge, and Manfred Frank. Thanks also to Robert Hartley and to the issue editors and anonymous reviewers of this article for the many improvements that they recommended. Any remaining shortcomings are entirely my own.

[2] Johann Wolfgang von Goethe, *Sämtliche Werke*, vol. 6.1, ed. V. Lange (Munich: Carl Hanser, 1986) 780. In this edition of Goethe's works, the sonnet is incorporated into the nineteenth scene of Goethe's play *Was wir bringen* (What We Present). Subsequent quotations from this edition will be referenced as MA, followed by the volume and page number. English translation here, and subsequently, from John Whaley, *Goethe: Selected Poems in a New Translation by John Whaley* (London: Dent, 1998) 83.

[3] Raymond Williams, *Keywords: A Vocabulary of Culture and Society*, rev. ed. (London: Fontana, 1983) 219. Jakob Grimm and Wilhelm Grimm, *Deutsches Wörterbuch* (Universität Trier with the Berlin-Brandenburgische Akademie der Wissenschaften, 2014) 13:429–42, s.v. "Natur," accessed March 21, 2014, http://woerterbuchnetz.de/DWB/?sigle=DWB&mode=Vernetzung&lemid=GN03181.

[4] Francis Bacon, "Thoughts and Conclusions," in *The Philosophy of Francis Bacon: An Essay on Its Development from 1603 to 1609 with New Translations of Fundamental Texts*, by B. Farrington (Liverpool: Liverpool UP, 1964) 99.

[5] Prisca Augustyn, "Language from a Biosemiotic Perspective," unpublished paper, **[OK?]**emphasis in original.

[6] Donald Favareau, "The Evolutionary History of Biosemiotics," in *Introduction to Biosemiotics*, ed. M. Barbieri (Singapore: Springer, 2008)**[Please also supply the full page range for the chapter]** here 32.

[7] Tommy Vehkavaraa, "From the Logic of Science to the Logic of the Living: The Relevance of Charles Peirce to Biosemiotics," in *Introduction to Biosemiotics*, ed. Barbieri, 257–82.

[8] Donald Favareau, "A Brief History of the Sign Concept in Pre-modernist Science," *Biosemiotics* 1 (2008): 5–23.

[9] Favareau, "Evolutionary History," 33, 32.

[10] With respect to these "persistent misunderstandings," see, e.g., Frederick C. Beiser, *German Idealism: The Struggle against Subjectivism* (Cambridge, MA: Harvard UP, 2002) 507–8.

[11] Among the most significant of these revaluations for my current purposes are, in addition to Beiser's *German Idealism*, Manfred Frank, *Eine Einführung in Schellings Philosophie* (Frankfurt/Main: Suhrkamp, 1985); Frederick Burwick, *The Damnation of Newton: Goethe's Color Theory and Romantic Perception* (Berlin: De Gruyter, 1986); Frederick Amrine, Francis J. Zucker, and Harvey Wheeler, eds., *Goethe and the Sciences: A Reappraisal* (Dordrecht: Reidel, 1987); Andrew Bowie, *Schelling and Modern European Philosophie* (London: Routledge, 1993); David Farrell Krell, *Contagion: Sexuality, Disease, and Death in German Idealism and Romanticism* (Bloomington: Indiana UP, 1998); David Seamon and Arthur Zajonc, eds., *Goethe's Way*

of Science: A Phenomenology of Nature (Albany: SUNY Press, 1998); Robert J. Richards, *The Romantic Conception of Life: Poetry and the Organic in the Age of Goethe* (Chicago: Chicago UP, 2001); Kate Rigby, *Topographies of the Sacred: The Poetics of Place in European Romanticism* (Charlottesville: University of Virginia Press); Nikolas Kompridis, ed., *Philosophical Romanticism* (London: Routledge, 2006); Paul Redding, *Continental Philosophy from Leibniz to Nietzsche* (London: Routledge, 2009); Dalia Nassar, *The Romantic Absolute: Being and Knowing in Early German Romanticism, 1795–1804* (Chicago: Chicago UP, 2014); and Dalia Nassar, ed., *The Relevance of Romanticism: Essays on German Romantic Philosophy* (Oxford: Oxford UP, 2014).

[12] Jesper Hoffmeyer, *Biosemiotics: An Investigation into the Signs of Life and the Life of Signs*, trans. Jesper Hoffmeyer and Donald Favareau, ed. Donald Favareau (Scranton, PA: University of Scranton Press, 2008) 4.

[13] Peirce is quoted in Wendy Wheeler, "The Biosemiotic Turn: Abduction, or, the Nature of Creative Reason in Nature and Culture," in *Ecocritical Theory: New European Approaches*, ed. Axel Goodbody and Kate Rigby (Charlottesville: University of Virginia Press, 2011) **[Please also supply the full page range for the chapter]** here 271.

[14] Emmeche is quoted in Hoffmeyer, *Biosemiotics*, 4.

[17] Kalevi Kull, "Jakob von Uexküll: An Introduction," *Semiotica* 134, nos. 1–4 (2001): here 4.**[Need full page range for article]**

[19] Kalevi Kull, "Semiotic Ecology: Different Natures in the Semiosphere," *Sign Systems Studies* 26 (1998): 344–71. On environmental literary and cultural studies, see Greg Garrard, ed., *The Oxford Handbook of Ecocriticism* (Oxford: Oxford UP, 2014).

[20] See, e.g., Val Plumwood, *Environmental Culture: The Ecological Crisis of Reason* (London: Routledge, 2002).

[21] Wendy Wheeler, *The Whole Creature: Complexity, Biosemiotics and the Evolution of Culture* (London: Wishart and Lawrence, 2006).

[22] Hoffmeyer, *Biosemiotics*, 309. See also Jesper Hoffmeyer, "Semiotic Freedom: An Emerging Force," in *Information and the Nature of Reality: From Physics to Metaphysics*, ed. Paul Davies and Niels Hendrik Gregersen (Cambridge: Cambridge UP, 2010) 185–204.

[23] Although not explicitly biosemiotic in approach, Gernot Böhme's phenomenological ethics of corporeal being (*Leib sein*) is exemplary of this line of thinking. See his *Ethics in Context: The Art of Dealing with Serious Questions*, trans. E. Jephcott (Cambridge: Polity, 2001).

[24] Plumwood, *Environmental Culture*, 97–122. On the role of language, and conceptions of language, in cementing the binary opposition of human and animal, see also Jacques Derrida, *The Animal That Therefore I Am*, trans. David Wills, foreword by Marie-Louise Mallet (New York: Fordham UP, 2008).

[25] The idea that Earth might be entering a new geological era, characterized by anthropogenic alterations to many Earth systems that began in the late eighteenth century, have accelerated dramatically since 1950, and will be legible in the geological record for millennia, was first advanced by atmospheric chemist Paul Crutzen and **[OK?]**the biologist Eugene Stoermer in an article in the *International Geosphere-Biosphere Programme Newsletter* in May 2000. This article, together with a commentary by the

eminent climate scientist Will Steffen, is included in Libby Robin, Sverker Sörlin, and Paul Warde, eds., *The Future of Nature* (New Haven, CT: Yale UP, 2013) 483–90.

[26] Johann Wolfgang von Goethe, *Selected Poetry*, trans. David Luke (London: Penguin, 2005) 55.

[27] Johann Wolfgang von Goethe, *Scientific Studies*, trans. and ed. Douglas Miller (Princeton, NJ: Princeton UP, 1988) 304.

[30] I. Kant, "Metaphysische Anfangsgründe der Naturwissenschaft," in *Werke in sechs Bänden*, ed. Wilhelm Weichschedel (Darmstadt: Wissenschaftliche Buchgesellschaft**[Need year of publication**) 5:11–135.

[31] Kant, *Kritik der Urteilskraft*, in *Werke* 5:542–51. Kant's discussion of biology as, at best, a *Naturlehre* (theory about nature) rather than a *Naturwissenschaft* (natural science) was nonetheless variously interpreted as licensing rather than limiting the empirical investigation of living organisms. See Richards 229–37.

[32] F. W. J. Schelling, *Von der Weltseele—eine Hypothese der höheren Physik zur Erklärung des allgemeinen Organismus*, ed. J. Jantzen with Thomas Kisser, *Werke*, vol. 6 (Stuttgart: Fromann-Holzboog, 2000) 255. Hereafter cited in the text as *W*.

[33] F. W. J. Schelling, *Werke*, ed. Manfred Schröter (Munich: Beck, 1958), 2:1–268, 269–326. On the relationship between matter, life, and consciousness in Schelling's thought of this period, see also Bowie 30–44.

[35] Beiser provides a particularly clear and detailed account of the metamorphoses in Schelling's *Naturphilosophie* between 1797 and 1800, including the inevitability of his break with Fichtean Transcendental Idealism (*German Idealism*, 483–550). See also Nassar, *Romantic Absolute*, 197–202, on the shift between the *Weltseele* and the *Erster*

Entwurf toward a more Goethean understanding of metamorphosis as a formative principle within nature itself. On Schelling's changing approaches to the onto-epistemology of nature, see also Joan Steigerwald, "Epistemologies of Rupture: The Problem of Nature in Schelling's Philosophy," *Studies in Romanticism* 41, no. 4 (2002): 545–84.

[36] Friedrich Schlegel, *Kritische Friedrich-Schlegel-Ausgabe*, vol. 2, ed. H. Eichner (Paderborn: Schöningh, 1967) 285. Except where I have indicated otherwise, the quoted translation is taken from Friedrich Schlegel, *Dialogue on Poetry and Literary Aphorisms*, trans., intro., and annotated by Ernst Behler and Roman Struc (University Park: Pennsylvania State UP, 1968), here 54. I have also amended the translation of the title because, first, "dialogue" implies only two speakers, whereas *Gespräch* can imply two or more (as indeed is the case in this text); and second, "poesy" is a more inclusive term than "poetry" (*Dichtung*) and thus closer to Goethe's *Kunst*, even though it is clear that Schlegel's primary interest was with verbal art.

[37] Nassar, *Romantic Absolute*, 122–23; and Beiser, *German Idealism*, 454–61. See also Alison Stone, "Friedrich Schlegel, Romanticism and the Re-enchantment of Nature," *Inquiry* 48, no. 1 (2005): 3–25.

[39] Goethe to Schelling, quoted in Richards 165.

[40] On the "dire" dimension of the *Erster Entwurf*, according to which each living being and every species constitutes a "botched attempt to depict the absolute," see Krell 96.

[41] F. W. J. Schelling, *System des transcendentalen Idealismus*, in *Schellings Werke*, ed. Manfred Schröter, vol. 2 (Munich: C. H. Beck, 1958) 623–24.

[42] Wendy Wheeler, introduction to *Biosemiotics: Nature/Culture/Science/Semiosis*, ed. Wendy Wheeler, Living Books about Life (2011), accessed February 25, 2014, http://www.livingbooksaboutlife.org/books/Biosemiotics. See also Wheeler, "Biosemiotic Turn," 273–76.

[43] Axel Goodbody, *Natursprache: Ein dichtungstheoretisches Konzept der Romantik und seine Wideraufnahme in der modernen Naturlyrik* (Neumünster: Karl Wachholtz, 1984) 21–34. See also Jörg Zimmermann, "Ästhetische Erfahrung und die 'Sprache der Natur': Zu einem Topos der ästhetischen Diskussion von der Aufklärung bis zur Romantik," in *Sprache und Welterfahrung*, ed. Jörg Zimmermann (Munich: Fink, 1978) 234–56; and, on the topos of the Book of Nature and its historical transformations, Hans Blumenberg, *Die Lesbarkeit der Welt* (Frankfurt/Main: Suhrkamp, 1981).

[44] Novalis, *Das allgemeine Brouillon: Materialien zur Enzykolopädistik*, in Novalis, *Schriften*, ed. P. Kluckhohn and R. Samuel, vol. 3 (Stuttgart: Wissenschaftliche Buchgesellschaft, 1968) 267–68.

[46] Goodbody has since become an eminent ecocritic in the field of German studies. See, e.g., Axel Goodbody, *Nature, Technology and Cultural Change in Twentieth-Century German Literature: The Challenge of Ecocriticism* (Basingstoke: Palgrave Macmillan, 2007); and Axel Goodbody and Kate Rigby, eds., *Ecocritical Theory: New European Approaches* (Charlottesville: University of Virginia Press, 2011).

[50] In the final sentence of the *Weltseele*, Schelling alludes to those ancient philosophers who identified the "soul of nature" as a "formenden und bildenden Aether" (*W* 257; formative ether).

[52] Frederick C. Beiser, "The Paradox of Romantic Metaphysics," in *Philosophical Romanticism*, ed. Kompridis, here 227.**[Please provide complete page range for Beiser's chapter in Kompridis.]**

[53] On the precedence of being vis-à-vis thought in Schelling's later philosophy, see Bowie 159–68.

[56] Nicholas Boyle, *Goethe: The Poet and the Age*, vol. 2 (Oxford: Clarendon Press, 2000) 676.

[60]. See also Rigby, *Topographies of the Sacred*, 33–38. For a reconsideration of the "romantic empiricism" of Goethe's morphological studies, in particular his "Die Metamorphose der Pflanzen," in the horizon of environmental philosophy, see Dalia Nassar, "Romantic Empiricism after the 'End of Nature': Contributions to Environmental Philosophy," in *Relevance of Romanticism*, ed. Nassar, 296–313.

[61] Gernot Böhme, "Die Einheit von Kunst und Wissenschaft im Zeitalter der Romantik," in *Für eine ökologische Naturästhetik* (Frankfurt/Main: Suhrkamp, 1989) 96–120.

[62] Günther Witzany, "Plant Communication from **[a?]** Biosemiotic Perspective," *Plant Signalling and Behaviour* 1, no. 4 (July–August 2006): 169–78.

[64] The pansemiotic dimension of the Romantic topos of the "language of nature" is emphasized by Zimmermann in "Ästhetische Erfahrung."

[65] Hans Blumenberg, *Die Lesbarkeit der Welt* (Frankfurt/Main: Suhrkamp, 1981) 228.

[68] Novalis, *Die Lehrlinge zu Sais*, in *Werke*, vol. 1, ed. Richard Samuel (Munich: Carl Hanser, 1978) 218–19.