

GOETHEAN SCIENCE AND OVERCOMING THE CARTESIAN SPLIT: A RESPONSE TO THE THEISTIC SCIENCE SYMPOSIUM AND “INTELLIGENT DEFAULT, PART I”

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I had the good fortune of attending the Swedenborg Scientific Association’s Theistic Science Symposium on October, 12, 2019, thanks to the tech team who live-streamed the event on YouTube. I tuned in at 6 a.m. PST in my temporary home in Burnaby, British Columbia, where I am on sabbatical fulfilling course requirements for a Philosophy of Education program with an emphasis on curriculum and pedagogy. As a college professor in the education department at Bryn Athyn College, I am especially interested in helping prepare future elementary school science teachers to teach science to children in a way that does not reinforce the materialistic, reductionist worldview that pervades both Western science and, increasingly, the teaching/learning paradigm itself. So, I was particularly interested to see what theistic scientists had to say both at the symposium and in the pages of *The New Philosophy*, where I read Reuben Bell’s article, “Intelligent Default: Emanuel Swedenborg’s Theistic Science As Model and Method for Solving Contemporary Problems in Natural Philosophy, Part I” (July–Dec 2016), which has since been published as the first three chapters of the book, *Intelligent Default: Swedenborg’s Theistic Science and the Problem of Organic Form*. Would the theistic scientists offer an alternative to a materialistic worldview that values only what can be reduced to measurable quantities? Such was my initial draw to the symposium. I was delighted to find that several ideas in Rev. Heilman’s presentation on correspondences resonated with my recent study of Goethe’s approach to science. In response to some of the ideas brought forward at the symposium and in Dr. Bell’s above-mentioned article, I would like to share some ideas about how Goethean science relates to Swedenborg’s doctrine of correspondences. Goethe’s approach to science supports Swedenborg’s conception of causality in a

55. Angela Rose has taught seventeen years as an elementary school teacher and ten years as professor at Bryn Athyn College. She is currently completing requirements for a PhD in educational theory and practice, via sabbatical. Ms. Rose’s dissertation explores the possible benefits of introducing future teachers to Goethe’s holistic approach to science and the relevance of Goethean science for a Swedenborgian perspective.

way that reductionist science cannot and overcomes the Cartesian split which lies at the foundation of the materialistic, reductionist worldview of Western science.

GOETHEAN SCIENCE

Goethe's Quest

I very much appreciated the wide scope of background information that Dr. Bell supplies in “Intelligent Default, Part I” (Bell 2016, 502–693), especially in regard to the evolution of Swedenborg’s doctrine of correspondences. Early on in his article, Dr. Bell states that Swedenborg’s theistic science “can be distilled into the pursuit of a single question: How does spirit come into nature?” (Bell 2016, 519). This question parallels Goethe’s quest. Goethe wanted to apprehend nature not in its finished forms, but in the creative moments of its becoming. Dr. Bell outlines the steps leading up to Swedenborg’s ultimate conclusion that the analytic mode of inquiry had failed him; Swedenborg’s *Rational Psychology* ends with a promise of a more complete explanation of the doctrine of correspondences at a later date. Soon thereafter, as Dr. Bell further recounts, Swedenborg met with a spiritual crisis and turned his attention from scientific investigation to the work of a revelator. It seems that Swedenborg had exhausted the avenue of reductionist science. He was not able to find the bridge from spirit to matter by looking into the minutest particles of matter or by delving down into evermore discrete degrees. The question of where the leap between worlds occurred could not be answered in a reductionist approach. Nor could it be answered in a Cartesian dualistic paradigm, but more on that later. Goethe’s holistic approach to science offers a mode of investigation that is capable of reaching the heights that, as Swedenborg discovered, analysis and abstraction cannot.

Johann Wolfgang von Goethe was born in 1749, the same year that Swedenborg published the first volume of *Arcana Coelestia*. Swedenborg died when Goethe was in his early twenties, shortly before Goethe rose to literary fame with his best-selling novel, *The Sorrows of Young Werther*. Scholars have written about the obvious Swedenborgian influence in Goethe’s later work and magnum opus, *Faust*, but I think Goethe’s scientific work is potentially

of far greater interest to a Swedenborgian audience. Swedenborg set aside scientific work to explore the inner meaning of Sacred Scripture; Goethe took up scientific work to explore the other foundation of revelation, nature. Their work converges in the concept of correspondence. “Correspondence” is Swedenborg’s term for the mutually dependent relationship between what exists simultaneously on the natural and spiritual planes.

Goethe’s scientific studies included botany, mineralogy, meteorology, anatomy, and optics. His notes are extensive, yet his scientific work is often dismissed on the grounds that it is simply a romantic’s reaction to the rise of Newton’s quantitative science. Goethe did indeed argue strenuously against Newton’s theory of light, but a superficial dismissal of Goethe’s work is just that. Taking the time to penetrate his approach to the study of natural phenomena—especially his study of plants—reveals how insightful his approach was and why it is so resonant with a theistic, Swedenborgian worldview. Even his theory of color, which contains a few errors acknowledged by today’s Goethean scientists, offers a solid platform for understanding color in a qualitative way that supports and enhances Swedenborg’s statements about the correspondences of various colors. Philosopher and historian, Frederick Amrine has published two volumes of *Goethe in the History of Science*, a bibliography of the thousands of scientific studies conducted in the Goethean tradition between the years 1776 and 1990. An anticipated third volume will bring the bibliography up to the present year. As Amrine (1996) states in his introduction,

Goethe is a significant figure in the history of science. He sought to develop a rigorous and empirical approach to the study of qualities that represents an important complement to quantitative methods. His works were highly influential among contemporary scientists, and have called forth an unbroken research tradition, a “Goethean paradigm” persisting within and against other dominant paradigms, that continues to this day. I realize that many will find these claims surprising, and perhaps insupportable. Yet I believe they are supported by the evidence in the following pages, and I intend to argue them at length in the third volume of the project.⁵⁶

Not surprisingly, many of the studies in Amrine’s bibliography are in German. But Goethean research is conducted today in English-speaking

56. Frederick Amrine, *Goethe in the History of Science, Vol I*, New York: Peter Lang, 1996: xi.

countries around the world as well. In its unique regard for the study of qualities, Goethean science makes room for a consideration of the realm of correspondences.

Goethe's Urphanomen and the Concept of Correspondence

Goethe approached the natural world through careful observation. By staying true to what is given in sense experience, Goethe developed an extraordinary degree of intuitive perception. In his work with plants, he spoke about encountering the *Urphanomen*, or Archetype, a concept which resonates strongly with Swedenborg's concept of correspondence. Goethe did not look for a mechanism of causality. Rather, he carefully described the unfolding gesture of organic forms. Although I appreciate many of Dr. Bell's points, I question his characterization of correspondences as being *mechanisms* of causation. Perhaps he is using a reductionist term in order to appeal to an audience of conventional scientists. However, if we reduce the living realities of the spiritual world into language that fits into the current scientific paradigm, I'm afraid we will remain stuck in the entrenched dogmas of materialism and be easily accused of merely inserting a theistic layer into a science founded on the assertion put forth by Bacon, Descartes, and Galileo that the only "qualities" science can consider are ones that can be measured. Reducing an organism to what is measurable removes all of the characteristics that give voice to that organism's essential way of being. Goethe's holistic approach offers an alternative to reductionism. Instead of looking for a mechanism of causality behind phenomena, Goethe observed phenomena in their wholeness and found a kind of causality closely aligned to Swedenborg's concept of correspondence.

In his presentation at the Theistic Science Symposium, Rev. Heilman showed a slide of the atomic structure of a ruby, a diamond, and graphite and asked the audience which two were the most similar. At the atomic level, the two that appear to be the most similar are the diamond and graphite, both forms of carbon. But to the naked eye and touch, the ruby is more similar to the diamond. Rev. Heilman pointed out that a ruby's hardness is next to that of diamond's on the Mohs scale. He explained that it is the *activity* of the ruby—the ruby being ruby—that makes it more like a diamond. Causality is thus found in the holistic, active living force making

its appearance in the natural world. The way that rubies appear in the world speaks the language of correspondence, indeed is correspondence. In other words, there is no need to look for a mechanism of correspondence. Correspondence is causality. Goethe's holistic approach to nature offers the possibility of intuiting this reality.

A signature difference of Goethe's approach to science from that of Newton's lies in seeking to *understand* nature rather than explain it with a theory. In fact, the word "theory" is used very differently in Goethe's framework. For Goethe, *seeing* the organism constituted theory. Goethe's definition of theory hearkens back to the original meaning of the Greek word, "theoria." As orthodox theologian, Andrew Louth explains,

The word *theoria* is derived from a verb meaning to look, or to see: for the Greeks, knowing was a kind of seeing, a sort of intellectual seeing. Contemplation is, then, knowledge, knowledge of reality itself, as opposed to knowing how: the kind of know-how involved in getting things done. . . . Human intelligence operates at two levels: a basic level concerned with doing things, and another level concerned with simply beholding, contemplating, knowing reality.⁵⁷

Louth's lesson in etymology neatly captures a key difference between conventional science and Goethean science. The goal of a conventional scientist is often to solve problems and develop technology, and, in the service of developing technology, theories are equated with tentative explanations of how things work. Goethe's goal was to understand and so, for him, the act of seeing the archetype was itself theory.

Just as Goethe had his own meaning for the word, "theory," he had his own conception of what constitutes an "experiment." Amrine (1998) states, "For Goethe, the experiment is not like a single, practical syllogism but rather like artistic practice directed towards the refinement of one's perception over time."⁵⁸ Entering into the science of correspondences would obviously require developing capacities for higher perception, and this is what Goethe was able to do. His training ground was the plant kingdom, where the principle of metamorphosis is always at play. Attuning his perception to the fluidity of form in unfolding organic growth gave Goethe a capacity

57. Andrew Louth, "Theology, Contemplation and the University," *Studies in Christian Ethics* 17 (April 2004): 66–67.

58. Frederick Amrine, "The Metamorphosis of the Scientist" in *Goethe's Way of Science*, (Albany: State University of New York Press, 1988): 42.

for perceiving the elusive, creative force within nature, which he referred to as an “open secret.” At the Theistic Science Symposium Rev. Heilman said, “The natural world, what we see and touch, is actually... spiritual.” We are witnessing the spiritual world around us all the time; we just don’t realize it. Nature’s secret is ubiquitous, yet mostly unobserved. Goethe developed a capacity for observation that revealed the playful, generative force at work in the myriad forms of the plant kingdom.

Rev. Andy Heilman showed two images of a nightingale during his presentation. One was a stylized drawing of a nightingale that looked like a mechanical bird, the other was a more photographic rendering that looked like a real nightingale. Rev. Heilman was making the point that the way we look at the organism determines what we see. Our perceptions are shaped by our assumptions. Do we see a mechanical creature devoid of connection to the spiritual world or do we see a manifestation of the spiritual within the natural? It is my contention that Goethe’s way of looking brought about an experiential conviction of the unity of the spiritual and natural. Goethe was seeing more than the materiality of the plant. He was seeing the *idea* of the plant fully manifested in the clothing of the natural world. For Goethe, the idea of the plant is not separable from its manifestation in the sense world; the archetype can only be discovered in seeing the continual work of an organism becoming itself.

During his presentation, Rev. Heilman discussed Swedenborg’s description of the three forces in creation. He said we can see the active force and the *formative* force in the world around us, but that we don’t really see the *creative* force in plants and animals. He said that to see the creative force, you have to be in the spiritual world in a living way, not a dead way. Goethe was able to do just that, enter into an observation of plants in a living way. Goethe went beyond Linnaean taxonomy, which focused on external, finished forms, to learn firsthand *from the creative, forming power* within the plant. He didn’t want to simply categorize plants, he wanted to understand the way each plant responded to and manifested the conditions and context in which it grew. How did he do this?

Goethe's Genetic Method

In *The Metamorphosis of Plants*, Goethe depicts the progressive iterations of leaf forms on a plant as alternating contractions and expansions from the cotyledons up through the stem leaves to the calyx and into the petals, and then stamens/pistil, followed by an expansion into fruit and a final contraction into seed. Each one of these stages, according to Goethe, is a metamorphosis of "leaf." None of this metamorphic movement is visible to the physical eye. We can't physically see any of these expansions or contractions of a leaf form. We can only intuit them. While Goethe was taking in the physical appearance of each progression of the leaf form, he could see the movement of metamorphosis with his mind's eye. (Many essays about Goethe's approach include an illustration of a plant's leaves spread out in ascending order up the stem showing the metamorphosis of the forms.) In following the plant's formative striving Goethe moved beyond the sense-perceptible and he saw the plant. The real plant. By "real" I mean what is simultaneously ideal and material. As Amrine (1998) puts it, what Goethe witnessed was "ideal without being abstract."⁵⁹ The ideal and the material come together in the act of seeing a particular plant following a lawful unfolding of its particular pattern of expansion and contraction in the possibilities of unending, yet lawful, variety.

In breaking through to an intuitive perception of the plant, Goethe was seeing, but not solely with the senses. He saw the movement of the plant's essential nature with his mind's eye. "Thought from the senses closes the mind, but "thought from the understanding opens the eye" (*DLW* 46). In Goethe's words:

Man must be capable of elevating himself to the highest Reason, to come into contact with the Divinity, which manifests itself in the primitive phenomena (*Urphanomenen*), which dwells behind them, and from which they proceed.

The Divinity works in the living, not in the dead; in the becoming and changing, not in the become and the fixed.⁶⁰

59. Frederick Amrine, "The Metamorphosis of the Scientist" in *Goethe's Way of Science*, (Albany: State University of New York Press, 1988): 42.

60. Frederick Amrine, "The Philosophical Roots of Waldorf Education, Part One," *Research Bulletin*, Vol 17 #2, (Autumn/Winter 2012): 39.

These statements are fully in accord with AC 5084.3 on nature's process of perpetually coming into being:

It is an illusion of the senses, a purely natural one, that the power which seeds have to grow into trees and flowers and to reproduce themselves was conferred on them when creation first began, and that that initial conferment is what causes everything to come into being and remain in being. People may be told that nothing can remain in being unless it is constantly being brought into being, in keeping with the law that continuance in being involves a constant coming into being, and with another law that anything that has no connection with something prior to itself ceases to have any existence. But though they are told all this, their bodily senses and their thought that is reliant on their senses, cannot take it in. Nor can they see that every single thing is kept in being, even as it was brought into being, through an influx from the spiritual world, that is, from the Divine coming through the spiritual world.

Goethe's study of metamorphosing organic growth brought him into a living perception of spiritual reality manifesting in the physical world. Today's Goethean scientists are not necessarily interested in following in Goethe's footsteps regarding the spiritual realm. As one writer put it, "The Goethean researcher is interested in observable phenomena, and has no desire to press behind the phenomena to some sort of metaphysical essence."⁶¹ Nonetheless, Goethe himself sought for a way to behold the archetypal plant. He found a way in what he called the "genetic method." (Goethe used the word "genetic" to refer to the "genesis" of organisms.⁶² The modern usage of "genetics" as the study of inheritance didn't start until over 100 years after Goethe used the word to describe his method.) Here is Goethe's own description of the genetic method:

If I look at the created object, inquire into its creation, and follow this process back as far as I can, I will find a series of steps. Since these are not actually seen together before me, I must visualize them in my memory so that they form a certain ideal whole.

At first I will tend to think in terms of steps, but nature leaves no gaps, and thus, in the end, I will have to see this progression of uninterrupted activity

61. Stephen Talbott, "Of Ideas and Essences," In Context #7, (Spring 2002): 3–4.

62. Gordon Miller, Appendix to *The Metamorphosis of Plants* by Johann Wolfgang von Goethe, (Cambridge, MA: The MIT Press, 2009): 105.

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as a whole. I can do so by dissolving the particular without destroying the impression itself.⁶³

As Gordon Miller (2009, 108) points out in his appendix to Goethe's *The Metamorphosis of Plants*, a scientist who uses the genetic method when observing, for example, a progression of leaf forms on a plant, focuses not on a series of static forms, but on

the relationship between the forms . . . so that the selfsame living idea that has expressed itself in the metamorphosis of the plant comes to life and visibility in the mind as well. What was successive in one's empirical experience then becomes simultaneous in the intuitively perceived idea. . . . Instead of an onlooking subject knowing an alien object, this is knowledge through participation, or even identification, of observer and observed—knowing things from the inside.

Here Miller introduces the idea that Goethe's approach to science is one of conscious participation—one that effectively overcomes the split between observer and observed. I suggest in what follows that Goethe's approach also overcomes the split between spirit and matter.

OVERCOMING THE CARTESIAN SPLIT

In his article, "Intelligent Default, Part I," Dr. Bell outlined Swedenborg's evolution of thought regarding his efforts to find the bridge between spirit and matter. Dr. Bell, as perhaps Swedenborg had, appears to accept the Cartesian split between spirit and matter, or mind and body, as a given, and in his article expresses dissatisfaction with both pantheistic and deistic solutions to overcoming this divide: "If even remotely connected, then all of creation is nothing but an extension of the Creator. But with no connection, the Creator does not participate in creation" (p. 531). Just a few pages later, Dr. Bell resolves the issue in a way that I think should be highlighted. He says that the bridge across the divide is the human being. Rather than looking for the missing link in subatomic particles, we can find the bridge between the spiritual and the natural in the human being. Referencing DLW 394 and AC 6057, Dr. Bell states:

63. Goethe, "Studies for a Physiology of Plants," in *Scientific Studies*, edited and translated by Douglas Miller (New York: Suhrkamp, 1988): 75.

It is now evident that in man the spiritual world is conjoined with the natural world, consequently that with him the spiritual world flows into the natural world in so vivid a manner that he can notice it, provided he pays attention (p. 534).

I would like to trace the implications of this idea that the human being is the nexus of the spiritual and natural worlds by sharing the work of two different Johanns. I have already, I hope, painted a picture of how Johann Wolfgang von Goethe came to see the archetype of the plant in a vivid manner. Goethe was able to approach the spiritual realm through beholding the sense world in a mode of intuitive perception. Importantly, for Swedenborgians, he was not thinking *from the senses*, which would result in seeing only dead matter. Goethe saw with his understanding. He could see the movement of the plant that is not apparent in the flat images on the back of the retina of the physical eye but can be perceived by the eye of the mind. Goethe's attention served as a bridge between the sensory world and the active, causal world of spirit. Now I would like to look at an idea developed by German idealist philosopher, Johann Gottlieb Fichte, who was Goethe's contemporary. What happens when, to paraphrase Dr. Bell, we pay attention in a vivid manner to attention itself?

This is the very question that Fichte pursued. I am indebted to the work of philosopher, Frederick Amrine (2012) whose article, "The Philosophical Roots of Waldorf Education" sheds light on how Goethe's and Fichte's approaches coincided. Goethe started out observing sensory phenomena and wound up seeing with the eye of sense-free understanding. Fichte focused his attention on the act of thinking itself and, like Goethe, discovered a mode of intuitive perception grounded in experience. However, since the object of this intuitive perception is the perceiving attention itself, Fichte's discovery is much harder to express than Goethe's. More recent philosophers, such as Rudolf Steiner, Owen Barfield, and Ronald Brady, have explored the same terrain as Fichte, as did Edmund Husserl, the founder of phenomenology. But before quoting some of these philosophers, I'd like to refer back to Rev. Heilman's presentation at the Theistic Science Symposium.

Rev. Heilman emphasized that when we observe something in the natural world—remember his example of a nightingale—we are actually seeing something spiritual. He said that the nightingale in the natural world is a spiritual nightingale; we see it *because we are also in the spiritual world*.

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The implication here is that the human being's act of cognition serves as the bridge between spirit and nature.

Brady (1981) points out that the act of cognition itself supersedes the Cartesian split. Our everyday attention is taken up by whatever it is focused on. Our attention is one with the object of our attention. *We lose sight of ourselves as an observing agent or director of our own attention* until we notice ourselves having whatever thoughts we may be occupied with at any given time. In that same instant, our attention is taken up with this new thought. In other words, we lose sight of our own subjectivity until we focus on it as such. What we can't do easily is turn our attention onto the very act of paying attention. Barfield puts it this way: ". . . it is impossible to observe [the thought-process] in its actual occurrence. We do not notice it because we cannot contemplate what we ourselves effect while we are in the article of effecting it."⁶⁴

As Brady (1981) further points out, we are so immersed in Cartesian and Kantian assumptions that we suppose ourselves to be subjective agents producing our own thoughts about an objective world (which includes both material objects and thoughts). Questioning the notion that we are sources of thought rather than receiving vessels is key to understanding Swedenborg's picture of the human being. Indeed, the doctrine of the *proprium*, or "as-of-self," is *sine qua non* for Swedenborgian theology. According to Swedenborg, all life is from the Lord. The appearance that we live and think from ourselves is just that, an appearance. Swedenborg revisits this idea many times, for example in AC 5084:

It is a fallacy of sense that man believes that he lives of himself, or that life has been imparted to him; . . . That it is the Divine alone which has life of itself, and thus that there is only one life, and that the lives in the world are only recipient forms, the sensuous mind does not at all apprehend (see §§ 1954, 2706, 2886–2889, 2893, 3001, 3318, 3337, 3338, 3484, 3742, 3743, 4151, 4249, 4318–4320, 4417, 4523, 4524, 4882).

Fichte had a similar conviction regarding the function of subjectivity. The Stanford Encyclopedia summarizes Fichte's insight this way:

64. Owen Barfield's essay, "Rudolf Steiner's Concept of Mind," is included as an appendix in Fred Amrine's book, *Kicking Away the Ladder: The Philosophical Roots of Waldorf Education* (Hudson, NY: Waldorf Publications, 2019): 176.

A fundamental corollary of Fichte's understanding of I-hood (*Ichheit*) as a kind of *fact/act* is his denial that the I is originally any sort of "thing" or "substance." Instead, the I is simply what it posits itself to be, and thus its "being" is, so to speak, a consequence of its self-positing, or rather, is co-terminus with the same.⁶⁵

In other words, the act of thinking precedes subjectivity. We can see this sequence unfold in the speech of young children. A two-year old child can speak and converse coherently, demonstrating the capacity of thinking, *before* being capable of uttering the word, "I." (While other words are learned and spoken out of imitation, the word "I"—and its related pronouns such as "my" or "mine"—can only be spoken out of an inner recognition of self-hood. Saying the word, "I" is a momentous step forward in child development.)

Rudolf Steiner describes the act of thinking as being prior to a sense of subjectivity in his major philosophical book, *The Philosophy of Freedom*:

The subject does not think because it is a subject, rather it conceives itself to be a subject because it can think. The activity performed by man as a thinking being is thus not merely subjective. Rather it is neither subjective nor objective; it transcends both of these concepts. I ought never to say that I, as an individual subject, think, but rather that I, as subject, exist by the grace of thinking, Thinking is thus an element which leads me beyond myself and relates me to objects. At the same time it separates me from them, inasmuch as it sets me as subject over against them.⁶⁶

In an intriguing passage, AC 1954, which serves to highlight the role of the human being as a bridge between spirit and matter, Swedenborg breaks down the true nature of seeing and answers the question as to *who* is doing the seeing in spite of all appearances to the contrary:

it is not the eye which sees but his spirit by means of the eye. . . . This too does not see of itself but from a sight more interior still, which is that of the rational. Nor again does the rational see of itself, but there is a sight more interior still, which is that of the internal man . . . Yet not even this internal man sees of itself; it is the Lord who does so by means of the internal man. He Alone sees,

65. Dan Breazeale, "Johann Gottlieb Fichte," *The Stanford Encyclopedia of Philosophy* (Summer 2018 Edition), Edward N. Zalta (ed.), <https://plato.stanford.edu/archives/sum2018/entries/johann-fichte/>.

66. Barfield quotes this passage from *The Philosophy of Freedom* in the essay, "Rudolf Steiner's Concept of Mind," included as an appendix in Amrine's *Kicking Away the Ladder*: 179.

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since He Alone has life and enables man to see, and to seem to himself to see of himself. Such is the situation with influx.

If the Lord alone sees, perhaps the human being's role is to be the means for the Divine to see its Own creation. In the meeting of the spiritual and natural worlds, human beings bear witness. Of course, there is a lot of excess mental baggage that interferes with noticing this role! Goethe was able to train his attention in such a way as to overcome egotistical distractions and enter into a state of beholding the archetype. He was able to intuit the presence of the spiritual within the natural. His was a conscious participation, an overcoming of the Cartesian divide. In the following quote, Goethe asserts the possibility of a theistic science that allows for the human being's participation in witnessing the creative force:

Yet, if we may raise ourselves within the moral sphere through faith in God . . . into a higher region and approach Primal Being, such may also be the case within the sphere of the intellectual—that through the observation of eternally creative nature we make ourselves worthy of spiritual participation in its productions.⁶⁷

Taken together, the work of Johann von Goethe and Johann Fichte play out the implications of the human being serving as bridge between the spiritual and natural worlds and thereby lay the groundwork for a science that acknowledges what lies beyond the merely measurable.

CONCLUSION

It was a privilege to virtually attend the Swedenborg Scientific Association's Theistic Science Symposium in October and listen to the presenters share their enthusiasm for exploring how influx from the spiritual world enters the natural world.

I very much appreciate that Dr. Bell has written a book sounding an alarm to stem the tide of scientific materialism, and I am especially interested in sharing Dr. Bell's concerns with future science teachers in the education program at Bryn Athyn College. As he points out, our connection to spirit is at stake. From its inception, reductionist science has aimed to control nature. In the words of Francis Bacon's *Novum Organic*, quoted in a

67. Walter Heitler quotes this passage from Goethe, HA, XIII:30–31 in his chapter, "Goethean Science" in *Goethe's Way of Science*.

footnote in Dr. Bell's article, "Intelligent Default, Part I," (2016, 588), "This is the foundation of all: We are not to imagine or suppose, but to discover, what nature does or *may be made to do*" (emphasis added). This attitude toward nature of control and manipulation has resulted in tremendous technological achievement for the benefit of many but also in disastrous degradation to the one planet known to sustain life. The students in our elementary school classrooms are the scientists of tomorrow who will have the technology at their disposal to do enormous harm or enormous good. They will need moral qualities and capacities far beyond technical know-how for there to be any hope of technology's benefits outweighing its harms. As Dr. Bell warns in his example of the potential misapplications of the human genome project, "reason alone results in dehumanization" (2016, p. 592). Goethe's holistic approach to nature is about beholding and listening, rather than controlling and dictating. Exposure to the practice of Goethean observation could help bring balance and awareness to our future scientists and teachers of science.

In "Intelligent Default, Part I," Dr. Bell poses the following question: "The scientific method is a powerful engine for getting at natural truths. But is it the only way?" (2016, p. 587). Goethe offered a different way of doing science, one that resonates strongly with Swedenborg's doctrine of correspondences. During his lifetime, Goethe's way of science found adherents but was not taken seriously by Newton's followers. Will it find traction in this century? Dr. Bell (2016, p. 646) assures his readers that there will always be those who discredit ideas that are not derived solely from materialistic methodology. And Goethe's holistic science is definitely not a materialistic methodology. Perhaps the readers of *The New Philosophy* will delve further into Goethe's approach. If they do, I believe they will discover a science that maintains rigorous standards of empirical observation while supporting a healthy connection to spirit.

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