

**INTELLIGENT DEFAULT:
EMANUEL SWEDENBORG'S THEISTIC SCIENCE
AS MODEL AND METHOD FOR SOLVING CONTEMPORARY
PROBLEMS IN NATURAL PHILOSOPHY, PART I**

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Plotinus the Platonist proves by means of the blossoms and leaves that from the Supreme God, whose beauty is invisible and ineffable, Providence reaches down to the things of the earth below. He points out that these frail and mortal objects could not be endowed with a beauty so immaculate and so exquisitely wrought, did they not issue from the Divinity, which endlessly pervades all things with its invisible and unchanging beauty.

—Augustine of Hippo (354–430), *The City of God*

Emanuel Swedenborg was no ordinary Age of Reason scholar. He claimed to have witnessed the Last Judgment unfolding in the spiritual world, and announced to the world the subsequent descent of the New Jerusalem, as foretold in *Revelation 21*—experiences that would determine the trajectory of his life's work. He came of age with the rise of modern science and the waning of religious orthodoxy. As a theistic scientist he was at odds with the naturalism of his colleagues, and as a mystical theologian he was equally at odds with orthodox Christianity. Yet his accomplishments in science and spirituality did much to improve the lot of both: his scientific discoveries are capable of informing twenty-first century physics and biology, and the spiritual principles he discovered are comprehensive enough to support a model inclusive of both. His method is as useful today as it was in his time. To support this claim, this study applies Swedenborg's science, spirituality, and method to a present-day problem in the natural sciences: the evolution of organic forms. Using his doctrines of influx, degrees, forms, correspondence, and others, which combine to produce a comprehensive model of spiritual causation, new light has been shed on this problem: natural forms are not "designed," nor do they appear by accident. Every organic form is a "default setting," as it were, established according to parameters inherent in matter, in response to environmental conditions, but dependent on reciprocal, functional interaction with a spiritual cause

as well. These parameters are analogically reflective of the divine human form, manifesting itself in continual creation. A comprehensive explication of Swedenborg's doctrines of forms and correspondence reveals these principles to be complementary structural and functional mechanisms of spiritual-natural influx, respectively. Change of form is by discrete degrees of order, and spiritual-natural interaction is by corresponding function. What results is matter, receptive of and responsive to divine influx, participating in the human form, to the limits of its organizational parameters. These parameters, seen from our natural perspective as the physical constraints of natural laws, are this divine human form accommodated to and at work in the natural world, apart from, and yet interactive with it. Evolution of new forms and adaptation of existing forms to changing conditions, occur in the crucible of the "randomness" of nature, into which, at its inmost level, flows the template of divine human form.

RATIONALE

What follows is a treatment of Emanuel Swedenborg's scientific program from five perspectives. In "Emanuel Swedenborg's Theistic Science in an Age of Reason" we begin with an overview of Swedenborg's science, identifying it as a theistic system in the materialistic context of the Enlightenment, and see how this may have affected his worldview. In "The New Jerusalem Come Down to Earth," we re-examine his life and work from the spiritual context of the what he came to identify as a new spiritual era—a spiritual "Last Judgment"—that would become the driving force of his life's work. In "Ezekiel's Wheels: Necessity As Method," we examine Swedenborg's mature system of nature, fully assembled into a paradigm sufficient to the tasks of a new science of natural phenomena. In "'Intelligent Design' isn't very intelligent without the New Philosophy" we find that without Swedenborg's theo-cosmology to supply a mechanism for the spiritual-natural causation underlying organic forms, we have a failed program of denial. In "Intelligent Default" we propose a "New Philosophy" from the collaboration of Swedenborg's principles with modern science, to work in addressing the biological problem of organic form: how natural forms come into being as a function of spiritual inspiration, in a new model of evolution.

In order to fully appreciate what the young scientist and philosopher was trying to do as he set out in the early eighteenth century, we must appreciate what it must have been like to live in the early Enlightenment. Everything he did was affected by currents from this exciting cultural period: his approach to science had to answer to new rules and new attitudes toward what is true and how he might come to know it; and because his science was openly theistic, his claims of spiritual cause for natural phenomena had to satisfy a new level of scrutiny. Creation by divine operation was no longer a given in post-medieval Europe. The modern science emerging in Swedenborg's lifetime was no longer consonant with Aristotle's *final cause*, in a new world of objective, sensory proof alone. Part I: "Emanuel Swedenborg's Theistic Science" will discuss his approach to the problems of causality and teleology, and examine his progress in this exciting but challenging scientific culture.

But Swedenborg was subject to other currents as well. Less visible, perhaps but potentially more pervasive than the intellectual stream, was the spiritual milieu into which his theistic science emerged. His was not just theistic science, but science for a new spiritual era of the human experience. His research program, from *On Tremulation* (1719), his earliest physiological work to *True Christian Religion* (1771), his last theological treatise, spanned the era of what he believed to be the spiritual Last Judgment. This event—with its influences before and after—everything he did. Part II: "The New Jerusalem Come Down to Earth" examines Swedenborg's spiritual history, and provides an explanation for the descent of the New Jerusalem, and his attachment to it. Without this perspective, our appreciation of much of Swedenborg's science, and the radical theology flowing from it, is incomplete.

Having looked at Swedenborg's research program from this historical perspective, we move to a treatment of his mature system of nature, but from a somewhat abstract point of view. We will watch as his major doctrines appear, each to answer problems presented by discoveries that came before, and each in its turn presenting new problems yet to come. We will see the emergence of these great scientific and philosophical principles on which his program would come to rest. These emerge in his scientific period but, from the necessity of a new inspiration, maturing in the theological period beyond, they become powerful tools to address the great problems of being from both the scientific and theological points of view. These problems

remain the same throughout, only couched in different terms; all have to do with how spirit comes into nature, how nature is formed, and the structural and functional relationship between the two. Part III: “Ezekiel’s Wheels: Necessity As Method” will bring Swedenborg’s system into full view, from having observed its assembly, one doctrine at time.

Moving to the present, Part IV: “Intelligent Design” will examine current attempts to deal with the obvious limitations of naturalistic science, particularly in the area of biological evolution. The emergent science of Intelligent Design will be examined, and found to be based on good science, despite its vociferous detractors among orthodox scientists. ID scientists are accomplished at finding flaws in the doctrine of natural selection, as it struggles to adequately explain the fundamental mechanisms of adaptation and speciation, but they do not attempt the suggestion of what a more likely mechanism for these might be. We find that this diminishes Intelligent Design to half a program, that cannot move forward from its current stalled condition.

Having seen the evolution of Swedenborg’s universal system of causality, and then the immediate necessity of a feasible model for spiritual-natural interaction to inform the problem of the emergence of organic forms, we move in Part IV: “Intelligent Default,” from abstraction to the practical application of this system as method. His theistic model of nature is a powerful tool for predicting and explaining the things we observe in the world. This is what science does, and this was precisely his intention—to explain natural phenomena according to objective scientific rules and laws, but to explain how these phenomena reflect the operation of an internal, spiritual cause. This axiom—that natural things have spiritual causes—lies at the base of theistic science. Swedenborg believed that if his scientific principles were clear and powerful enough, and if they behaved according to Enlightenment rules for doing science, and if their underlying spiritual principles showed the same consistency of logic and reason, then he could present an intellectually defensible science for his time and for the future. From the tone of his writings, he was confident that this was the case.

Swedenborg’s system might be applied to scientific problems in any discipline, from the physics of the quantum world, to cosmology, chemistry, or any of the biological sciences. As a theistic method, it necessarily starts

from a different perspective, but could nonetheless inform any corner of scientific inquiry.

This study supports this claim by directing Swedenborg’s scientific method to a significant problem of our own time. Choosing the discipline of organic evolution as our subject, we will use Swedenborg’s doctrines and method to address this perennial biological problem. The question of what drives the evolution of organic forms is not only a biological problem of great complexity, but it is a mine-field of controversy as well, energized by the polarized forces of simplistic religion and dogmatic scientific materialism—just the arena for testing Swedenborg’s powerful ideas. The elegant science of our day stands ready to be applied to a plausible theistic science of final cause and spiritual influence.

INTELLIGENT DEFAULT: CHAPTER ONE

EMANUEL SWEDENBORG’S THEISTIC SCIENCE IN AN AGE OF REASON

An abyss of revelation

The scientific and theological works of Emanuel Swedenborg have been artificially divided by an abyss of revelation. Because of the obvious abrupt change in both the style and content of the books published after his spiritual crisis of 1744–45, it is easy to presume that the two collections are essentially unrelated. In a stark transition from the rigorous analytical method of his scientific works, we find in Swedenborg’s theological Writings¹ an exegetical style, dependent no longer on the reproducible sensory data of the scientific method alone, but on spiritual experience, with the added authority of divine revelation. Such is the nature of these Writings, as clearly described by Swedenborg himself.²

1. The use of the capitalized technical term “Writings” for Emanuel Swedenborg’s theological works is a convention of certain denominations within the Church of the New Jerusalem, to denote the perceived special status of this corpus as divinely inspired doctrinal teachings. This is comparable to the usage of “Ketuvim” in the three-part canon of the Hebrew TaNaKh: *Torah* (the Law), *Nevi’im* (the Prophets), and *Ketuvim* (the Writings).

2. Swedenborg states in many places in the theological Writings that his inspiration is taken directly from spiritual experience in the presence of spirits and angels and the Lord

The nature of this transition is problematic for those students of Swedenborg's scientific works who appreciate his theological Writings as the inspired works they claim to be. How, for example, are we to consider certain "revealed" doctrines basic to the theological works, that are to be found essentially complete in works clearly scientific, and therefore by tradition not "inspired"? How are we to interpret a statement in the *True Christian Religion* (1771) referring the reader to cosmological principles which have been explained "in what has been set forth in my works [OPERIBUS MEIS] respecting creation?"³ Does this statement endow Swedenborg's *Principia* (1734),⁴ a science book ostensibly dealing with particle physics, magnetism and cosmology with the inspired authority of the theological Writings?

The trouble is that many principles basic to Swedenborg's theology do appear in the scientific works as well, and his obvious use of certain of these scientific principles in theological constructions cannot be overlooked. There is also the question of which principles, if any, might Swedenborg have gleaned from other philosophers, eventually to find their way into his science, and later his theology?⁵

These significant problems will be addressed by examining Swedenborg's scientific works in an analytic way. The method will identify specific elements of these works which 1) may have been derived from other philosophers, and which persist in the theological works, 2) were apparently derived from Swedenborg's original scientific thinking and also persisting in the theological works, and 3) are doctrines appearing *de novo* in the theological works, which clarify or even supersede elements of the scientific works. What will emerge from this analysis of the scientific works are identifiable lines of thought—a conceptual tree of sorts—converging but still incomplete at the time of Swedenborg's transition from scientist to revelator, but perfected thereafter by the addition of certain critical and unifying truths.

Himself. Three such declarations appear in *Arcana Coelestia* §§ 5, 67–68, and *Heaven and Hell* § 1.

3. This statement, found in *True Christian Religion* § 33, likely refers specifically to Swedenborg's *Principia*, and not his "works" in general. Alfred Acton II examines this problem in "What Were They Fighting About?: A Revue of the Argument over the Nature of Spiritual Creation," in *The New Philosophy*, Vol XCVIII, Nos. 1 & 2, January–June, 1995, p. 43.

4. Swedenborg, Emanuel, *The Principia* (1734), W. Newbery, London, 1846. Reprinted by the Swedenborg Scientific Association, Bryn Athyn, Pennsylvania, 1976.

5. For a detailed analysis of the philosophical influences on Swedenborg's spiritual-natural paradigm, see "Swedenborg's Mind," in Appendix A.

To introduce the reader to this process, Swedenborg's major scientific works are presented chronologically here, with commentary to put them into the perspective of this study:

1719 *On Tremulation*

A tentative work dealing with human anatomy and physiology, but also speculating on the role of certain anatomical structures in the transfer of information within the body. The idea of a harmony of sympathetic vibrations between anatomical components is introduced—an early look at “action-at-a-distance.” After this very promising beginning, Swedenborg set aside this line of investigation for the pursuit of cosmology.

1721 *Principles of Chemistry*

A treatment of the geometrical internal arrangement of matter, the enduring concept in this book defines matter as serial aggregations of components differing in complexity of arrangement, but not substance. A theory of creation emerges from this series, originating from a single, mathematical point.

1729 *Lesser Principia*

A short work improving on the concept of the mathematical point said to be the simplest of matter in the *Chemistry*. Matter must begin with a binary of two simples, fluent and quiescent, reciprocally associated.

1734 *The Principia*

A major work attempting to explain creation (as in the *Chemistry*) by a series of compounding aggregates of matter derived from active and passive primary particles. Essential to extended matter is motion, provided by a *conatus*, or creative urge, from the Infinite. Creation proceeds by a series of compounded finites in increasing degrees of complexity, with each successive level containing the one before.

1734 *The Infinite and the Final Cause of Creation/Intercourse Between the Soul and the Body*

This philosophical/scientific work represents a turning point in Swedenborg's scholarly life, as it is here that he shifts his attention away from cosmology and physics, and begins an earnest search for the soul. Realizing the need for more anatomical expertise, he embarks on extensive self-study and finally formal studies in Paris, 1736–38, in the School of Surgery and Dissection.

1738 *The Cerebrum*

Written in Venice following his anatomical studies, this is a comprehensive treatment of the brain, with a clear interest in localizing its interaction with the soul. Here are seminal studies on the animation, or intrinsic motion of the brain and its membranes, and the secondary motion of the skull bones, as well as insightful and ingenious interpretations of endocrine neurophysiology and the central role of the cerebral cortex in motor function.

1740 *Dynamics of the Soul's Domain*
(formerly entitled *The Economy of the Animal Kingdom*)

A major work on human anatomy in four parts. The soul is at first identified in association with the blood, which, by means of its various divisions, provides for its distribution to all parts of the body. Following this there emerges an extensive model of a dynamic contiguum of adjacent membranous and fibrous parts, uniting all elements of the body in a universal system of functional integration.

1741 *The Fibre*

This is a continuation of the *Dynamics* series, and describes the medullary substance of the brain and spinal cord, and the peripheral nerves. The functional relationship between nerves and vessels is explored, and it is here that Swedenborg presents his Doctrine of Forms.

1742 *Rational Psychology*

This final work of the *Dynamics* series examines the operation of the soul with respect to its contribution to rational thought. The soul is above the senses, and yet is in touch with what goes on below it by means of an analogical link that Swedenborg declines to describe, putting this off to another time. This will eventually become his Doctrine of Correspondence.

1743 *The Organs of Generation*

This work, part of the *Soul's Domain* (formerly *Animal Kingdom*) series, again examines the operation of the soul in the body, but from the perspective of its descent. From its origin in the "cerebral gland" the soul descends into the body via the cerebrospinal fluid, where it is delivered by the circulation to the generative organs themselves.

1743 *The Brain*

A second major work on the brain, dealing again in considerable detail with the animation, or inherent motion of the cerebrum, and focusing on the cerebellum and spinal cord as well. In this work we find a description of the "circle of life": the descent of the "animal spirit" from the cerebrum via the cerebrospinal fluid, to be delivered to all parts by the circulation of the blood, which, when depleted, is returned to the cerebrum via the arteries for repletion.

1744 *The Five Senses*

This work, another part of the *Soul's Domain* series, examines the sensory nervous system. Swedenborg speculates here on the interaction of the sensory nerves as intermediates between the natural world of stimuli, and the soul that interprets and makes use of this information.

1744 *The Soul's Domain (formerly entitled The Animal Kingdom)*

A major series of works of the same nature as *Dynamics of the Soul's Domain*, but from the perspective of the soul itself. Its goals were to define a "rational psychology," or the working of the mind, and to gain knowledge of the soul, "the crown of my studies." From this approach, Swedenborg hoped to identify the seat of the soul in the body. Leaning toward the brain as the site of this nexus, the series nonetheless ends in an unfinished state, a reflection of the author's failure to define the nexus in anatomical terms. Major contributions of the series (which includes *The Brain*, *Rational Psychology*, *Organs of Generation*, and *The Five Senses*, as well as the two-volume *Soul's Domain* itself) are the further development of the contiguum concept, relation by degrees, and the necessity for a doctrine of correspondences (briefly described, but never fully developed). This unfinished study was terminated by Swedenborg's spiritual crisis, from which followed his theological period.

YOUNG SWEDENBORG

Young Swedenborg was a voracious student of philosophy and science. He traveled widely, visiting the scholars and libraries of Europe, leaving voluminous notes in his wake.⁶ From these notes we have a good idea of his interests, and although these were predictably broad, it is possible to identify some primary sources for the philosophical principles that would inform his life's work. Some of these ideas he later discarded and some he modified, but some of these principles he embraced to the end of his life. These seminal ideas are of interest for the purposes of this study, as they serve to place Swedenborg in the context of the history of ideas in general, and in the cultural and scientific revolution of the Enlightenment in particular. Even a man of Swedenborg's genius does not operate in a vacuum, and his debt to the philosophers, from Plato and Aristotle to those Age of Reason natural philosophers who ushered modern science into the world, cannot be overlooked.

6. Of these notes, the most widely known are those edited and collected by Alfred Acton in 1931, in *A Philosopher's Notebook*. Organized by topics, it documents Swedenborg's interests as a young scientist comparing notes with the best minds of history.

CONTRIBUTIONS FROM OTHER PHILOSOPHERS

It has been stated that Swedenborg is a Neoplatonist⁷, and there is truth to this claim; his sublime sense of spiritual-natural reality could lead us to think nothing else. But no university of the early modern period would neglect to lay a solid base of Aristotle's doctrines beneath the feet of its graduates, and Swedenborg's Upsala University was no exception. His philosophy, science, and even elements of his theology bear clear traces of Aristotelian logic, ethics, and natural philosophy. It is more likely that Swedenborg was trained as an Aristotelian and based his natural philosophy on this pragmatic corpus; but to this he added the metaphysical dimension only the Platonic tradition could provide. So in Swedenborg it is no surprise that we find a reciprocal dualism of complementaries proper to the complete human being that his science would build, and that his theology would fashion into an authentic image of God.⁸

From Plato we can trace Swedenborg's firm belief in the two worlds, with the human being as the *microcosm* of the greater one. His notion of spiritual perfection playing out in imperfect nature is certainly Platonic, as is the seminal idea of an immortal soul. And to Plato's *Timaeus* it is tempting to credit Swedenborg's choice of geometrical forms in the building up of matter, as found in the *Chemistry* (1721) and *Principia*.⁹

7. Scholars have long made the connection between Neoplatonic and Swedenborgian spiritual-natural dualism, to the degree that this has become a literary truism of sorts. Blake, Emerson, Henry James, Sr., and others have made a strong case of Swedenborg's debt to the Platonic tradition:

"A Review of 'The Secret of Swedenborg: Being an Elucidation of His Doctrine of Divine Natural Humanity'" by Henry James, Sr., *North American Review*, Vol 110, No. 227, April, 1870, pp. 463-468.

Riley, I. Woodbridge, Review Author, "Swedenborg and the 'Sapientia Angelica' by Frank Sewall", *Journal of Philosophy, Psychology, and Scientific Methods*, Vol. 8, No. 21, October 12, 1911, pp. 580-583.

"Emanuel Swedenborg", Tiscali Reference Encyclopedia, Helicon Publishing, December 2, 2006, retrieved March 10, 2009 from <http://www.tiscali.co.uk>> <http://www.tiscali.co.uk>.

8. One of the most pervasive doctrines in Swedenborg's system as a whole is the principle of a dual spiritual nature, manifested as the reciprocal dualism of love (good, or will) and wisdom (truth, or understanding) in the human being. This idea appears in his science as the dualism of an active and a passive in all things, from the smallest "elementary particle" of matter, to the "two brains" (cerebrum and cerebellum) that impart the understanding and the will, respectively. The origin of this dualism is the nature of God Himself as the Divine marriage of love (life) and wisdom (love in form). Thus are human beings truly created "in the image of God."

9. Geometric examples from Swedenborg's *Principles of Chemistry* (1721, Part III) include the particulate nature of water as the "sixth dimension," built up from the aggregation

Swedenborg's debt to Aristotle is conspicuous in his devotion to the logical method of his arguments, both scientific and theological. And just as Aristotle's before him, Swedenborg's cosmology depends on the mechanical behavior of contiguous particles in a universe that admits of no vacuum. Aristotle's *final cause*¹⁰ is paramount in Swedenborg's end, cause and effect philosophy of being, challenging as he does the rising insistence of the scientific naturalism of his day that this question about natural things was extraneous to the scientific method. The *scala naturae*,¹¹ or great chain of being, seems certainly to have been a part of Swedenborg's consciousness, as he developed his ideas on nature as an organizational hierarchy. An ancient concept, it must have been a given for any classically trained natural philosopher of the Late Middle Ages. Expanding on the linearity of this "chain," Swedenborg's degrees govern hierarchical interactions, but in a three-dimensional matrix. And his chain was for all things of creation—not just organisms, but for all their anatomical parts as well.

Less pervasive in Swedenborg's system perhaps, but of no less ultimate importance is Aristotle's concept of *minima naturae*—the smallest division of matter that can still hold a form—which we find modified but present nonetheless, as the *limbus*, the natural "border" or "edge," composed of the "finest things of nature," that maintains the spiritual body in its human form. That Swedenborg was a thoroughgoing Aristotelian is a given; but in Swedenborg we find a system that has moved beyond its Aristotelian

of spherical "crustals" from its origin in the mathematical point, or *ens primum*, and the "vertical," "triangular," "triangular pyramidal," and "quadrilateral pyramidal" positions of spherical particles in complex. In his *Principia* (1734, Part I, Chapter II) we find the "most perfect motion" to be circular, and points moving thus describe a "spiral figure, which in itself is the "most perfect" of figures; and "elementary particles" in such motion move in a "vortex." All of this is reminiscent of the role of the Platonic solids in the origin of the forms of natural matter.

10. Aristotle described a world in which all things are delimited by four kinds of causes, as the various means to their existence: the *material cause* (what the thing is made of), the *formal cause* (what form the thing assumes), the *efficient cause* (who or what formed the thing), and the *final cause* (the thing's "end," purpose, or use).

11. A concept that can be traced from the Greek philosophers, it was powerfully stated by Aristotle to describe the relationship among all participants of creation, arranging these in a hierarchy of authority from God to humans to animals of varying degree, to plants, and finally to non-living matter. This concept was enlarged in the Medieval period, to provide an explanation of the order of God's creation, and as such attained quasi-doctrinal authority for the church. It was an important intellectual development, as it saw fixity of species as a given in creation, thereby impeding the development of evolutionary thought. An excellent statement of the historical development of this concept is found in Lovejoy, Arthur O., *The Great Chain of Being: The History of an Idea*, Harvard University Press, Cambridge, 1936.

roots to embrace a Neoplatonic causality, thereby incorporating both into a unique working model of his own, for a spiritual-natural universe.

As a young man coming of age in the Enlightenment, it is hard to appreciate Swedenborg's enthusiasm for science, not as just an occupation, but as a completely new way of finding truth. Born only 68 years after the publication of Francis Bacon's incendiary *Novum Organum* breathed life into science as a method, it is no surprise that he rebelled against his father, the Bishop of Skara, and followed the call of natural philosophy instead of theology. Unknown to the headstrong lad of twelve entering Upsala University, the one would eventually lead him to the other; and it would become his quest to show the world that the two are one.

Swedenborg must have known Francis Bacon's *Novum Organum* and its metaphorical frontispiece very well.¹² Here sails the ship of science, out, between the pillars of Hercules, leaving the safety of the known world for the exciting discoveries of the future. By the time he was a young scholar, the contagion of Bacon's work had swept the learned world and changed it forever.¹³ Old ideas and prejudices were being overthrown, and new, scientific principles were taking their place, formed by *induction*, or the application of careful observation and reason. It was in the excitement of this era that Swedenborg the scientist came of age. It is tempting to imagine that this image of a ship, sailing out of the classical world into the new world to come, was on his mind as he finished the Prologue to *The Soul's Domain* (1744), an urgent invitation to sail with him in this ship to unknown worlds.

Let us then gird up our loins for work. Experience is at our side with a full horn of plenty. The nine virgins are present also, adorned with the riches of nearly two thousand years: I mean, all the sciences, by whose abundance, powers, and patronage, the work is constructed. The sciences are indeterminate and of no profit or advantage, unless they be applied and made subservient to uses. What is knowledge of numbers, ratios, figures, and forms, in arithmetic

12. See this highly metaphorical figure in Appendix B.

13. "While Bacon's claim to be the methodologist of the new science that emerged in Europe is often disputed, his position as the prophet of a new culture in which the new science took root is universally acknowledged . . . Bacon's reputation as the prophet of the new culture of the West has persisted to our day." Bajaj, Jatinder K., "Francis Bacon, the First Philosopher of Modern Science: A Non-Western View," in *Science, Hegemony and Violence, A Requiem for Modernity*, Edited by Ashis Nandy, the United Nations University, Oxford University Press 1988.

and geometry, apart from its benefits in civil life? What are the philosophical sciences, with their predicates, qualities, modes, and accidents, without reference to reality? All things, at the present day, stand provided and prepared, and await the light. The ship is in the harbor; the sails are swelling; the east wind blows; let us weigh anchor, and put forth to sea.¹⁴

In addition to Bacon's underlying influence, three principle Age of Reason philosophers from whom Swedenborg seems to have drawn most heavily are René Descartes, Gottfried Wilhelm von Leibniz, and Christian Wolff.¹⁵ Appearing frequently in his *Philosopher's Notebook* and elsewhere, it is possible to draw some conclusions as to which of their ideas were incorporated into Swedenborg's scientific thinking. Some of these ideas can be followed into his theological writings as well, so a discussion of these ideas is useful to demonstrate important contributions to Swedenborg's science and theology as well.

René Descartes

Of all the philosophers, Swedenborg seems to have drawn most heavily from Descartes. Predictably influenced by the philosopher who had enjoyed such success in Swedish intellectual circles,¹⁶ and just ahead of the overriding influence of Newton's physics, Swedenborg began his scientific career firmly grounded in the Cartesian notions of contiguity, pure and total motion, and an identifiable nexus of soul and body. Three Cartesian ideas of particular importance to Swedenborg's philosophical system are 1) the universe is not a void, punctuated by occasional dense bodies such as suns and planets, but is in fact a series of contiguous bodies of differing motion, 2) all things are mechanical in nature, and 3) the soul is joined in some

14. Swedenborg, Emanuel, *Animal Kingdom [The Soul's Domain]*, Walton and Mitchell, London, 1843, Reprinted by Swedenborg Scientific Association, Bryn Athyn, PA, 1960., § 23.

15. For a substantial discussion of the possible contributions of the German philosophers to Swedenborg's development, see Nemitz, Kurt P., "The German Philosophers Leibniz and Wolff In Swedenborg's Development," *The New Philosophy*, Vol. XCVII, July–December, 1994, pp. 411–425.

16. Descartes had earned an elevated status in Swedish intellectual circles by joining the court as philosophy teacher to Queen Christina. From his arrival in 1649 to his untimely death only five months later, Descartes enjoyed a life of both scholarship and celebrity.

real way to the (mechanical) body, and leaves it at death.¹⁷ His system of analytic geometry may have been an inspiration as well, for Swedenborg's geometrical approach to the building up of matter. These ideas are basic to Swedenborg's cosmological and philosophical statements, and to his refinements of the mechanism of interaction between soul and body as well. His reliance on these great concepts never falters.

Gottfried Wilhelm von Leibniz

From Leibniz, Swedenborg gained valuable insight into the nature of matter, a concept of mind, and the idea of action-at-a-distance by means of a kind of harmony among interacting components.¹⁸ Leibniz postulated an "alphabet" of human thought (a *universal mathesis*) which could explain complex phenomena by means of simpler ones or even symbols of these. This problem inspired Swedenborg to develop a practical language of analogy, and as we shall see, its perfection was to elude him to the bitter scientific end, finding full expression only in a mature metaphysical concept of spiritual-natural correspondence. Improving on Descartes' notion of a mind/body nexus, Leibniz places the human mind in an imperishable "kernel" of the body which survives death, an idea to surface much later, greatly modified, in Swedenborg's *limbus*, the envelope or containant of the human soul, composed of the "finest things of nature."¹⁹ Further ideas of great importance to Swedenborg were that matter is composed of elemental units called *monads*, related according to a divinely *preestablished harmony*, and that the body and the soul interact by means of this same principle. Perfecting this hypothetical interactive mode in his later description of *coestablished harmony*, Swedenborg nonetheless owed much to Leibniz for the rudiments of this concept. Of equal importance is Leibniz's restatement of the ancient notion of concurrent active and passive forces associated

17. Piat, Clodius, "René Descartes," in *The Catholic Encyclopedia*, Vol. IV, The Gilmary Society, New York, 1913, pp.744–748.

18. Turner, William, "The System of Leibniz," in *The Catholic Encyclopedia*, Vol. IX, The Gilmary Society, New York, 1913, pp. 134–138.

19. In *True Christian Religion* § 103 Swedenborg describes this containant: "After death every person lays aside the natural which he got from his mother, and keeps the spiritual which he had from his father, together with a sort of envelope (*limbus*) around it, composed of the finest things of nature." This *limbus* is a compelling yet elusive concept appearing in Swedenborg's works, that is difficult to interpret.

with his *monads*, a model persisting in Swedenborg's "first finite" of the creational series found in the *Principia*.

It is also possible that the relational dynamic among Leibniz's monads may have contributed in part to the development of Swedenborg's powerful Doctrine of Series and Degrees. In his *Monadology* (1714) Leibniz describes a quantitative difference between monads, resulting in a hierarchical ordering of these elements, from the smallest parts to the whole, lending a kind of dynamic, holographic unity to the universe. This was a hierarchical (Swedenborg's "discrete" degrees) system, but a complex ("continuous" degrees) structure as well, in which all entities are immediately cognizant of all other entities. It is tempting to see this order of complexity as an inspiration for what Swedenborg calls the "unanimous action"²⁰ of all the otherwise discrete parts in a series.

Christian Wolff

Borrowing less perhaps from Wolff than from Descartes or Leibniz, Swedenborg nonetheless gained much from Wolff's clear explication of the ideas of other philosophers, and he was particularly attracted to his explanation of extended matter and non-extended substance, an arrangement allowing a clear distinction between the natural and the spiritual worlds. Although Wolff proposed a rather mechanistic model for the human body, Swedenborg was attracted to his explanation that this body could work toward the final cause of God, and could thus be both efficient and final cause.²¹

Although one might argue for other foundational ideas appearing throughout both Swedenborg's scientific and theological works which might be included here as having been derived from other philosophical sources, those selected for discussion here are clearly major concepts, presenting little

20. In *Divine Love and Wisdom* § 194, Swedenborg explains how this kind of complexity plays out in the pragmatic example of muscle fibers: "It should be known that each degree is made distinct from the others by coverings of its own, and that all the degrees together are made distinct by means of a general covering; also, that this general covering communicates with interiors and inmosts in their order. From this there is *conjunction of all parts and unanimous action* (*omnium conjunctio et unanima actio*)." (Emphasis added.)

21. Hettche, Matt, "Christian Wolff", *The Stanford Encyclopedia of Philosophy* (Winter 2014 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/win2014/entries/wolff-christian/>>. Accessed on 02/15/15.

difficulty in identification or interpretation as they appear in his subsequent works.²² From this collection of philosophical foundations we shall proceed to a discussion of other, different ideas found in Swedenborg's philosophical and scientific works which, as above, persist in his theological writings as well. The difference is that these principles appear to be original with Swedenborg, derived from his *induction* of both his findings and those of others, by application of a scientific method for finding truth from experience alone.²³ Swedenborg believed himself to be "the first who has taken this course professedly."²⁴

SWEDENBORG THE SCIENTIST

As comprehensive as Swedenborg's scientific works appear, his theistic science can be distilled into the pursuit of a single question: How does spirit come into nature? To address this fundamental question, he had to start with simple explanations that predictably led to further questions, each with their own explanations, and so on in a lifelong series of discoveries. We can trace these discoveries in his published works, and in retrospect we can see how each solution to each major problem required the pursuit of yet more answers. At intervals, he developed major "doctrines" (which we might call models, or hypotheses) to answer questions and move his research program forward. Assembled end-to-end, we find a remarkable series of scientific principles, like steps, allowing him to ascend to within reach of that fundamental goal. These models, in the order of their discovery, were 1) a feasible model for the origin of natural matter from spiritual substance, 2) his concept of the *Contiguum*, 3) his doctrine of series and degrees, 4) his doctrine of forms, and finally, his capstone doctrine of correspondence. These we need to discuss in some detail in what follows.

22. For a more comprehensive treatment of the influence by other philosophers on the evolution of Swedenborg's thought, as well as his selective departure from them, see "Swedenborg's Mind," Appendix A of this study.

23. Swedenborg was intent on ascending to the anatomical domain of the soul by scientific reasoning based entirely on experience, but by means of "new ways," which make this possible. His discussion of this process, which he called the *analytical method*, may be found in the Prologue to *The Soul's Domain*. These "new ways" unfold as novel philosophical doctrines, some of which will mature into important theological principles as well.

24. Swedenborg, *The Soul's Domain* § 15.

The Nature of Matter

Viewed in its entirety, Swedenborg's scientific corpus attempts an analysis and explanation of the soul's operation in the body. From an early speculative treatment of physiological action-at-a-distance in the short work *On Tremulation* (1719), he moved to human anatomy, first in a general way, and then to a more specific, detailed anatomy of the brain. The physiology of the nervous system followed on, with more analysis of the role of the blood and associated humors in carrying a spiritual-natural essence from its source to its destination in all parts of the body. In this grand narrative, he defines the soul and locates its residence in the substance of the cerebral cortex. With all this in mind, it is easy to question his early turn from this theme to a substantial interlude in chemistry and physics.

The answer to this question lies in his purpose for writing *Principles of Chemistry* (1721) and *Principia* (1734) before returning to anatomy and physiology. Physical sciences they may be, but for his purposes studies in chemistry and physics were simply starting from the beginning. In order to explain an interactive mechanism for spirit into nature, he had first to establish a rationale for bringing nature into being—deriving natural matter from its parent spiritual substance. This required a comprehensive treatment of matter itself—how it was established and how it behaved at its most primitive level. This was uncharted territory, and had first to be explored and mapped in order to move on to his soul-body research program.

The first, and perhaps most basic of foundational ideas in Swedenborg's scientific works is his own description of the smallest component of extended matter, that particle giving rise to all other matter in a series of combinations. This was the philosophical *prima materia*, developed by Swedenborg over time into a model satisfactory to the requirements of his cosmology. Appearing first in *The Chemistry* as a dimensionless mathematical point (differing little from the classical Euclidean concept), matter was built up from this entity in motion, in a series of "crustals," which compounded into particles of greater and greater complexity. Each crustal is contained in the crustal subsequent to it in the series, providing a functional continuity to matter at all levels of complexity.

Finding a purely mathematical point inadequate for the production of matter with both active and passive attributes, Swedenborg, in the *Lesser*

Principia, revised this “simple” into an entity of two modes, *fluent* and *quiescent*, which combine to become matter. The first “bullular particle” has a surface of quiescent points, an active interior of fluent points, and a fluent sphere outside its surface. It is not difficult to see the rudiments of modern atomic theory in this energetic, bipolar representation of the bullular particle.

Building on this improved model of matter, the *first natural point* emerges in the *Principia* as the particle resulting from motion imparted to a dimensionless simple by the will of the Creator. This is an entity bridging the Infinite and the finite, its perfectly circular motion imparting only one dimension, awaiting the addition of linear motion to become extended in space. Within this particle is contained all active and passive principles—all of matter in potential.

By means of the spiritual *conatus*²⁵ to motion internal to this “first natural point,” the first extended particle is produced—one of dimension because it moves, not only internally, but now in a line through space as well. Defining one dimension, and thereby part of space,²⁶ and by the combination of internal and external motions, the figure this “first finite” describes in space is a spiral, eternally reciprocating from center to circumference and back again.

Aggregates of connected first finites produce a passive entity, capable of receiving motion. This, the second finite, is produced from the combination of firsts, by contiguity. If, however, a first finite is independent of this contiguity, it becomes an active of the first finite, a particle of matter with inherent motion, and a functional reciprocal to its passive counterpart. It is

25. Swedenborg uses an accepted technical term of his day here, that is rich with historical precedent and metaphysical virtue. Rendered “endeavor” by most English translators, the term implies a spiritual urge behind the motion that *conatus* imparts. This is a window into the theistic nature of Swedenborg’s program: a firm foundation in spiritual reality and the spiritual origin of natural things. In Swedenborg’s cosmology, *conatus* implies an internal effort to motion. In *The Principia*, Chapter II § 13, he says that this effort originates from “pure motion” in the Infinite, and projecting an image of this as a “prime mover” for all of nature, he says, “the cause of motion, inasmuch as it remains in each individual particle, and no single particle can be moved without all being moved together, hence becomes common, and pervades the whole; so by reason of it all endeavor, and conspire together to produce one common and unanimous motion: this is what we mean by *conatus*, or *effort*.” There is a comprehensive treatment of this term as it has been used by philosophers from the ancient Greeks, through the classical era, the Renaissance and Enlightenment, up to the modern era: Aware of the anti-Wikipedian bias of the scholarly world, I am nonetheless compelled to recommend this article as a very useful reference for this essential concept: <http://en.wikipedia.org/wiki/Conatus>.

26. In a sense, this one-dimensional particle is not just “part of space,” but as a participant in the creational series, could be said to create space as it irrupts into nature.

the combination of these two—the passive “second finite” and the “active of the first finite” which finally produces the first atom, or *elementary particle*. This particle is truly matter, from which, through a series of combinations, all things of the universe are built up. It is a reciprocal association of active and passive, just as in his *Principles of Chemistry*, but developed to near perfection.²⁷ We will find this binary construct again, in the theological Writings, manifested as the *Conjugal Principle*, the presence of the divine marriage of Love and Wisdom—the Creator Himself—in all things of heaven and earth.²⁸

As we will find in a section to follow, Swedenborg was aware of the opinions of his contemporaries on this problem of what we might now call “emergence,” as well as his own debt to Aristotle for the classical notion of an observable, “singularist” view of end-cause-effect causality.²⁹

The contiguum

The next foundational concept is the connected nature of all things in series, already implied in the creational sequence of the *Principia* as fundamental to the nature of matter itself. An idea appearing in the earliest scientific works, we find it first in *On Tremulations* (1719), in a discussion of the connection and harmony among all parts of the human body by means of the small nerves (called “fibers” here by Swedenborg). A stimulus to any single part, we are told, is essentially a stimulus to all parts as well, by means of a contiguous system of membranes, from the dura mater to the finest membranes investing the smallest parts.

27. Swedenborg’s detailed description of the simple and its progression to the “elementary particle” is presented in the *Principia*, chapters I–VI. Subsequent chapters in Part I deal with combinations of these elements in a series of “finites” in a creational sequence leading all the way to the formation of the solar system and earth.

28. Examples of this universal principle are found in *Arcana Coelestia* § 718 and *Divine Love and Wisdom*, §§ 14, 34, 36, 46. See also Bell, Reuben P., “The Conjugal Principle,” *New Philosophy*, Vol. C, Nos. 1 & 2, January–June, 1997, pp. 531–545.

29. In her discussion of Hume’s argument against the idea of necessary connection in the observation of causation, Helen Beebe defines “singularism” as “the view that causal relations are intrinsic relations, and so their obtaining does not depend on on the relative events instantiating a regularity.” This is in line with Swedenborg’s conception of the matter. (Beebe, Helen, Hitchcock, Christopher, and Menzies, Peter, Ed., *The Oxford Handbook of Causation*, Oxford University Press, Oxford, 2009, p. 472.)

Next, we find a restatement of this principle in the *Principia*, offered as an example in a discussion of connectedness prescient of the doctrine of series and degrees:

We see then that there is a contiguity in all things, and that nature produces them by means of connection, extending from one end to the other, both of substances and causes The case is the same in animals; parts cover over parts, and grow by contiguity. Both the nervous and membranous system is coherent and contiguous. There is not part in the whole animal to which fibers, muscles, veins, and arteries do not extend; no fiber, which is not derived and ramified by some larger nerve; no nerve, which does not proceed from the medulla spinalis or oblongata and its teguments; and no vein, but what originates from that great one which flows immediately from the heart. The medulla and its teguments, with which the nerves are connected, are in contiguity with the membranes of the whole brain; its grosser coats are contiguous to its more subtle ones; the dura mater to the pia mater; the pia mater to the more subtle parts; and thus the contiguity is continued till it arrives at those simple active substances, from which all motions or affections can afterwards reflect and expand themselves to the most principles of all. Hence it is manifest that there is a continual connection of the whole body with its minutest parts.³⁰

Nowhere, not even in his major anatomical works to come, does Swedenborg describe contiguity more completely and elegantly than in this statement. This quotation demonstrates a mature concept of functional integration in the human body, in place by 1734.

In *The Mechanism of the Operation of the Soul and Body* (also of 1734), Swedenborg expands the concept of the functional nature of this anatomical contiguity, calling it the *contiguum* in this book, and explaining its importance in both physical and spiritual terms. “With the microscope,” he says, “we observe in the lesser the causes which produce motion and extension in the larger.”³¹ All connection supposes contiguity, and the contiguum is the whole system of membranes and fibers, from grosser to finer, spanning and

30. Swedenborg, Emanuel, *The Principia*, Walton and Mitchell, London, 1848, reprinted by the Swedenborg Scientific Association, 1976, Vol. I, pp. 21–22.

31. Swedenborg, Emanuel, *The Infinite and the Final Cause of Creation*, also *The Mechanism of the Operation of the Soul and Body* (1734), Swedenborg Society, London, 1965, p. 27.

connecting the whole body to a level far below the limits of the microscope. At this finest level is the nexus of soul and body.

The contiguum next appears in *The Fiber* (1741), of the *Dynamics of the Soul's Domain* series, in a discussion of the tunics of nerves and fibers, where a contiguum of nerves is described, from the brain to the finest peripheral branches, along with their tunics, in the whole body. In another context, the pia mater and arachnoid meninges of the brain are identified as universal membranes of the encephalon, in communication with this contiguum of fibers and nerves.

Swedenborg's most rigorous description of the contiguum appears in *The Soul's Domain* (1744), where, in the chapter entitled "The Peritoneum," we find an exacting description of the three-dimensional membranous matrix spanning levels of complexity from grossest to finest parts.³² This description does not end with anatomical relationships, but for the first time includes a consideration of the functional nature of the system. Here we find a statement of the role of these membranes in "communication, powers, and actions"—a purpose for this anatomical arrangement beyond that of mechanical support alone.

In the posthumously published *Rational Psychology* (1742), another in the *Dynamics of the Soul's Domain* series, Swedenborg adds a consideration of this contiguum with respect to its function in the cerebral cortex. There is a contiguum of nerves and fibers in the whole brain, we are told, "so that there is no part of the cortex that does not share in the sensation that comes in."³³ Another, separate treatise of this year (1742) discusses a holism of fibers, each acting separately but also promoting "the general cause."³⁴

From this brief review, it is evident that Swedenborg's idea of the contiguum was well established early in his career, and was a concept that went far beyond purely descriptive anatomy. His vision of functional integration of myriad body parts, in the concurrently separate and collective

32. In *The Soul's Domain*, Vol. I, Ch XVI, §§ 318, 19, 20, we find not only a very modern description of the matrix of connective tissue membranes and fibers linking all levels of organization in the human body, but a prescient appreciation of this system as communicative as well as structural.

33. Swedenborg, Emanuel, *Rational Psychology*, A. Acton, Ed., Swedenborg Scientific Association, Philadelphia, 1950, § 18.

34. Swedenborg, Emanuel, *Psychological Transactions and Other Posthumous Tracts, 1734–1744*, Tr & Ed. by Alfred Acton, Swedenborg Scientific Association, Bryn Athyn, PA, 1984, Chapter III of Transaction No. 5, Action, pp. 118–19.

operation of each, is a concept which has yet to be fully appreciated by the reductionist science of our own era.³⁵ And in an astonishing extension of this structure/function model of organic integration in the human body, we will find this same system, if we look for it, in the complex interactions of angels and their societies in the heavens, all existing and interacting in human form.³⁶

The doctrine of series and degrees

After the nature of matter and the contiguum, Swedenborg's third major concept matures as his doctrine of series and degrees, but begins with his analysis of the nature of the connection between elements in a relational series. Growing out of the foundational philosophical premise that all things must participate in a causal series of end, cause, and effect, Swedenborg expands this idea by application of his own experience in anatomy and the natural sciences into a practical principle beyond the hypothetical case.

35. Research in molecular biology and osteopathic medicine of only the last fifty years has produced a model of functional integration of fascial elements by means of piezoelectrical and electromagnetic induction and electron semiconduction, as well as structural continuity. Swedenborg's *contiguum* is now the *matrix*, a universalizing concept that promises to explain the unanimous action of all parts, long observed but never before explained in physiological terms. For an introduction to this concept, see

Bell, Reuben P., *Experimental Consideration of Structural Proteins as Electron Conductors—A Conceptual Model of Functional Integration in Biological Systems*, Master's Thesis, University of Tulsa Graduate College, Tulsa, Oklahoma, 1977; Lee, R. Paul, *Interface: Mechanisms of Spirit in Osteopathy*, Stillness Press, Portland, Oregon, 2005; Bell, Reuben P., *The Osteopathic Hologram: A Multidimensional Model For Diagnosis and Treatment*, *Journal L'Ostéopathie Précisément*, Numero 22, Été 2006; Paoletti, Serge, *The Fasciae: Anatomy, Dysfunction, and Treatment*, Eastland Press, Seattle, Washington, 2006.

36. There is a mystical tradition recognizing the process of Creation by means of the Divine in human form. The "Primal Man" of the *Upanishads* gives rise to the world, and the *Macroanthropos* of Plutarch was a similar creational figure in the Greek tradition. The Gnostic *Anthropos* of the heavens was the template by means of which the *Demiurge* fashioned the earthly Adam. The Apostle Paul, in his letter to the Corinthians, taught that the "body of Christ" was the collection of believers in the world who, as its "members" functioned as an organic human whole. The centerpiece of the Jewish *Kabbalah* is the *sefirot* (emanations) of *Ein-Sof* into Creation in the form of *Adam Kadmon*, or "primordial man," by means of which spirit is translated into nature. As he so often did, Swedenborg saw this same spiritual principle, but through a larger lens, calling it *Maximus Homo*, or "universal human,"—the heavens, with the individuals there and their communities, functioning as organs in a single body. For Swedenborg the *emanations* become correspondences of these, giving form and life to all things of the natural world: "The whole visible universe is therefore nothing else than a theater that is representative of the Lord's kingdom. And this in turn is a theater representative of the Lord Himself." (*Arcana Coelestia* § 3,483)

A look at his personal notes reveals his debt to classical notions of this hierarchical nature of matter. In *A Philosopher's Notebook (1740-41)*³⁷ we find a short section, "Degrees, Priors, Posteriors," summarizing the thinking of Aristotle, Plato and Leibniz on the ordered relationship of substances and organisms in the universe. Things do not exist independently of other things, but exist prior and posterior to them, in a well defined causal series. The very fabric of the universe rests on this structural pattern. Following Descartes as well, Swedenborg would have had an appreciation for his causal principle, that ". . . states that the realities of the effect must be present in some sense in the total efficient cause . . . as they cannot come to effect out of nothing."³⁸ Unaware of the complications that would eventually encumber this straight-line notion of causality,³⁹ the simple causal series of end, cause and effect was gospel for Swedenborg, who saw no philosophical problem with it. To him, it was an axiom of reality.

As mentioned above, Leibniz's interactive matrix of monads must have been particularly compelling in this respect. In developing a doctrine of relationship to fit his anatomical and physiological observations, he no doubt started with these philosophical notions in mind. His doctrine of degrees departed from the classical model in the particular extent to which he developed it; and it superceded the Leibnizian model in its practical applications. As is common in Swedenborg's work, familiar concepts are often put to use in new and expanded ways to serve the purposes of the program at hand.

37. Swedenborg, Emanuel, *A Philosopher's Notebook: Excerpts from Philosophical Writers and from the Sacred Scriptures on a Variety of Philosophical Subjects; Together with Some Reflections, and Sundry Notes and Memoranda*, Alfred Acton, Tr. and Ed., Swedenborg Scientific Association, Philadelphia, PA 1931, pp. 236–240.

38. Beebe, *Oxford Handbook of Causation*, p. 57.

39. Swedenborg and his contemporaries were unaware of how complex their ostensibly straight-forward concept of causation would eventually become. Philosophers of our own era have demonstrated a spectrum of qualifiers for what can be classified as the cause of an effect. Christopher Hitchcock defines a number of different causal concepts from within what he calls the "causal modeling framework," describing these members as "a range of new concepts," and states that "there is no presumption that any one of these concepts is uniquely deserving of the title 'causation'." (op. cit., *Oxford Handbook of Causation*, pp. 305–306). In the same source, Peter Godfrey-Smith describes a causal pluralism of difference-making and production that taxes the intuitive sense in determining the connection between events (Ibid., pp. 329–330). That there exists an *Oxford Handbook of Causation* of 790 pages is testimony to the continued Enlightenment-inspired reductionism by the sciences and the philosophical systems that support them.

No mention of a doctrine of degrees is found in *On Tremulation* (1719), but the concept is there nonetheless. The structural relationship of the elements of the fibrous contiguum are so arranged, but Swedenborg makes no statement about this arrangement as representative of any special principle. Similarly, within this same context, the *Principia* says that the elements of the contiguum “owe their existence to their mutual dependence on each other, there being a connection, by mediums, from ultimate, whence all things have respect to their first source from which they derive their existence.”⁴⁰ He completes this thought in a later section, by stating that “the visible world is a series of finite things both simultaneous and successive; modified and connected one with the other in a multiplicity of ways, and in a long extended order.”⁴¹ The concept of degrees is here, virtually complete, but without a statement of its doctrinal status, and without a formal name.

A name does appear in *The Infinite*, in which we are told that for the world to exist, its elements must be related in a series of perfections, or degrees. “The essence of the finite consists in its subjection to degrees and the laws of succession and derived substantiality”⁴² By 1734 we have evidence of a relational scheme governed by certain laws. The general name of this scheme is “degrees.”

By 1740, this principle had become a well developed doctrine of influence and connection, fully demonstrated in *Dynamics of the Soul's Domain*. Chapter VIII of Part I (“An Introduction to Rational Psychology”) is devoted entirely to the explication of this doctrine of series and degrees, its practical applications, and its implications for other problems of causality. “This doctrine constitutes a principle part of the natural sciences; for everywhere in nature there is order, and everywhere the rules of order. It is a doctrine which expounds the nature of the veriest form itself, without which nothing which is predictable of anything can occur.”⁴³

In this lengthy treatment of the subject, the general characteristics, varieties, and special features of things related by degrees are fully described, and the fundamental nature of the doctrine is explained. Here we find that “the general series of the earth . . . are themselves also three, and are

40. Swedenborg, *Principia*, p. 20.

41. *Ibid.*, p. 190.

42. Swedenborg, *The Infinite and the Final Cause of Creation*, p. 116.

43. Emanuel Swedenborg, *Economy of the Animal Kingdom* [*Dynamics of the Soul's Domain*], Swedenborg Scientific Association, Bryn Athyn, PA, 1955., § 581.

commonly called kingdoms; namely the mineral, vegetable, and animal kingdoms."⁴⁴ The same property applies to "every individual animal," we are told. Each animal is "a series of several other series that are essential and proper to the general one. Its essential and proper series are the viscera . . . the higher series are the cerebrum, cerebellum, medulla oblongata and spinalis. The lower are the lungs, stomach, liver, pancreas, spleen, womb, kidneys and several others. These, taken together, are constituent of the form."⁴⁵ All things, we learn, from the universe itself, to the minutest parts of parts, are arranged in a structural and functional series of order inherent to them. And by this principle, all things are related, in a grand and orderly scheme.

This concept of discrete and continuous degrees of order is immediately the most pervasive of Swedenborg's doctrines, explaining as it does the operations of nature on virtually every level, and by necessity attempting ultimately to explain the operation of the divine in nature as well. And at long last, in rational terms, the mystical paradox of pantheism⁴⁶ appeared approachable by his doctrine of series and degrees. Here was a single principle, at work on both spiritual and natural levels, that promised to explain the reality of the two as one.

The doctrine of forms

We find a notion of connectivity and interaction by discrete and continuous degrees in Swedenborg's earliest anatomical works.⁴⁷ As described above,

44. Ibid, § 584.

45. Ibid, § 585.

46. Any creational scheme must deal with the problem of connection between Creator and creation. In the kabbalistic series of sefirotic emanations by means of which *Ein-Sof* steps down into creation, there is no identifiable point at which divine becomes natural; *Malkut* is no different than *Keter*, and *Ein-sof* and nature are one. It is the same with the creational *pleroma* of the gnostics, the series of worlds across which the divine descends to enter into nature: divine is continuous with nature. This presents a major problem for human spiritual freedom or free will; if God creates the natural world from himself, with no mechanism to effectively separate himself from it, then nature is an extension of God, and its creatures, including human beings, are gods as well. This is *pantheism*, a condition of continuity of God with nature. Solutions to this problem must consider its opposite condition, that of complete separation, as seen in the eighteenth century development of *Deism*. Swedenborg developed a model in which there is a structural separation of God and nature to allow for free will, but a functional relationship allowing for the operation of the divine providence in the natural world as well.

47. As early as 1719, in *On Tremulation* we find a speculative model of communication between remote parts of the body by means of minute vibrations (tremulations), traveling

this relational scheme provides the functional basis for his anatomical and physiological works. But as did all of his doctrines, this one calls for yet another, supporting doctrine to take it to its logical conclusion. As he learned in an early attempt at explaining soul-body interaction,⁴⁸ discrete degrees can take us from the level of the whole organism down to its inmost parts, but they cannot take us beyond that to the soul. Each degree is a step, just like the steps of a ladder, and there is no provision in the doctrine of series and degrees for a jumping-off place, if we are looking to move from body to soul, nature to spirit. If spirit comes into nature, forming nature as it comes, and if this creational process involves an orderly series of steps, each successively less divine and more natural, down to the inert minerals of the earth, then where is the definitive step across which spirit is no longer spirit and nature becomes wholly inert? This presents a major problem of action-at-a-distance; without a sufficient explanation, the infinite regress fallacy⁴⁹ collapses Swedenborg's whole program.

We find the solution in *The Fibre* (1742), another in the *Dynamics of the Soul's Domain* series, following the introduction of the doctrine of series and degrees. Its necessity is obvious; Swedenborg had been wrestling with this problem since his earliest works.⁵⁰ *The Fibre* gives a detailed description of

along the nerves. But this communication could not be possible without an orderly, hierarchical arrangement of these nerves, and in describing this arrangement, we find Swedenborg's notion of discrete and continuous degrees of order at work. And his description of these levels at work in the whole organism presages his later model of the matrix-like *contiguum*, here as well.

48. In *The Infinite and the Final Cause of Creation/The Mechanism of the Operation of the Soul and Body* (1734) Swedenborg makes a measured case for climbing up to the soul, but was unable to explain just where and how the nexus between these two levels of reality might be. The nature of this elusive nexus within the relational series of discrete degrees, would require much more work for him to find.

49. We will encounter this claim in Part III, in opposition to theistic explanations of evolution, by proponents of scientific materialism. "Infinite regress" is an old argument, but one that cannot be easily tossed off, in the defense of any model of spiritual causation. It was famously framed by Stephen Hawking, in *A Brief History of Time* (1988), becoming a cliché of sorts, in scientific circles: "A well-known scientist (some say it was Bertrand Russell) once gave a public lecture on astronomy. He described how the earth orbits around the sun and how the sun, in turn, orbits around the center of a vast collection of stars called our galaxy. At the end of the lecture, a little old lady at the back of the room got up and said: "What you have told us is rubbish. The world is really a flat plate supported on the back of a giant tortoise." The scientist gave a superior smile before replying, "What is the tortoise standing on?" "You're very clever, young man, very clever," said the old lady. "But it's tortoises all the way down!"

50. As early as 1734, we see the necessity for a solution to this problem, when, in *The Infinite and the Final Cause of Creation*, Swedenborg is unable to identify a nexus, across

the fine structure of the brain, with attention to the nature of the fibers that make up the cerebrum and cerebral cortex. It is here that he finally makes the case for a causal series allowing for spiritual-natural interaction. This he does by introduction of a powerful model of transmutation in seven consecutive forms, from the inert material of the mineral world, inwards to the divine form itself. In his doctrine of forms, each form is less fixed and more fluctuant than the one before, by means of subtle changes of geometry, and each is uniquely suited to a particular use. Angular gives way to circular, and circular to spiral. Spiral forms are suited to the movement and morphology of the medullary fibers and the brain itself. And then the series moves inward, to structures so abstracted that they are seen with the mind's eye alone. The vortical form, moving towards a level beyond space and time, provides the structure of the mind that interacts with the matter of the brain. From here, we move inward, beyond the world of quantity and extension, to levels defined by qualities of divine intention.

In this sequence of seven forms we find the nexus—not a single “jumping off place,” but a series of steps from heaven to earth. Swedenborg explains it this way:

In each degree, when forms are carried up by this ladder, something earthly, material, and finite is cut away and put off, and a certain celestial, perpetual, and infinite is superadded and put on . . . until at last nothing except what is perpetual, infinite, eternal, pure, holy, that is, Divine, remain.⁵¹

In Chapter XVI we find a challenging 32 page treatment of Swedenborg's doctrine of forms. The challenge is not just in archaic terminology or issues of translation, although these are always considerations in Swedenborg's scientific works. The real challenge comes in comprehending a system that moves from our familiar world of measurable time and spatial extension, to a pre-geometric world of intention and quality; and then comprehending that these are complementary attributes of a single reality. Swedenborg's method is at work here, in a model that allows us to visualize the dynamic interface of spirit and nature, not in metaphysical language alone, but in terms of science and geometry as well. This is the goal of valid theistic

which spirit and nature might interact. In this work, as in *Dynamics of the Soul's Domain*, it is “discrete degrees, all the way down.”

51. Swedenborg, Emanuel, *The Economy of the Animal Kingdom, Transaction III: The Medullary Fibre of the Brain and the Nerve Fibre of the Body*, Swedenborg Scientific Association, Bryn Athyn, Pennsylvania, 1918, § 271. (Commonly known as *The Fibre*.)

science. But our minds and our science must be acclimated to navigate such a system as this.

The doctrine of correspondence between the two worlds

As we have seen, it was late in the development of the doctrine of series and degrees that the question of the nature of relationships of things distant in the hierarchy was raised, which led of necessity to a consideration of the ultimate problem of relationship and distance—that of the relationship of spiritual to natural things. How to get from the one to the other was addressed by the doctrine of forms; the “jump” was no jump at all, but was instead across the span of an orderly series of geometrical forms, each uniquely suited to function at a particular level of existence. But there was no easy solution to the most important question of all. The new problem was that of action across this phase change of spiritual substance to natural matter: what force or impulse connects spirit with nature across the divide, and what maintains this relationship?

Despite every effort to complete this progression of influx to degrees to forms to what lies beyond, Swedenborg found himself increasingly frustrated by the elusive nature of this principle. There was still the problem of pantheistic connection to overcome: 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. Dismissing these extremes of pantheism and deism, Swedenborg sought the mechanism whereby the two worlds could be linked in action, but apart in space. The problem was crucial to solve, and simple enough in principle, but it seemed impossible. The doctrine of correspondence, the last of Swedenborg’s major concepts to be considered here, proved to be the most demanding of them all.

Correspondence as a doctrine is not considered as early as *On Tremulation*, but we do find its rudiments in the “Fourth Rule of Tremulation”: There are sympathetic vibrations in strings if both strings are tuned to the same key.⁵² Elsewhere in the book is a discussion of whole systems of sympathetic tremulations arising from a single small tremulatory force.⁵³

52. Swedenborg, *On Tremulation*, p. 2

53. *Ibid.*, pp. 13–14.

It is in *The Dynamics of the Soul's Domain* that Swedenborg demonstrates both the necessity and utility of a doctrine of correspondences. The discussion arises in Part I, Chapter VIII, I–IX, the same series dealing so completely with the doctrine of degrees examined above. He begins by stating that Aristotle's "physical influx," Descartes' "occasional causes," and the "preestablished harmony" of Leibniz are all inadequate to solve the problem of spiritual/natural association.⁵⁴ The problem with these systems is our "want of knowledge respecting the subordination of things, and the connection of things subordinate."⁵⁵ It is not enough to know how things are arranged; we must know how that structure facilitates the interaction of the spiritual cause and the material effect. Offering his doctrine of Series and Degrees as just such a system, he approaches the problem of causality by replacing these previous models with his own principle of *coestablished harmony*.⁵⁶

Later, we are given five rules governing the relationships of individual elements of different organizational levels which correspond (some general rules for correspondence).⁵⁷ This serves as an introduction to both the necessity and the general nature of correspondences, again called *coestablished harmony*, but it offers little in the way of a mechanism for how things might interact by means of these relationships. His description is more anatomical at this point than dynamic, and is confined to the relation of things on the natural plane alone.⁵⁸

In Part II of the same book, however, in a section dealing with the human soul, Swedenborg finally discusses correspondences with respect

54. It is of interest that this problem of causality, addressed here in a scientific context, reappears at the end of Swedenborg's life, in his theological Writings. In *Soul-Body Interaction* (1769), we find a much expanded comparison of these philosophical hypotheses, with a detailed argument for his concept of *coestablished harmony*.

55. Swedenborg, *Dynamics of the Soul's Domain*, § 579.

56. Swedenborg, *Dynamics of the Soul's Domain*, § 593

57. *Ibid.*, § 648.

58. In *Dynamics of the Soul's Domain*, Part I, Chapter VIII we find a discussion of the correspondence between successive members of a series of degrees. One example of this is taken from the series of red blood, purer blood, spirituous fluid. Each of these "bloods" corresponds to the one above and below it in the series, and the vessels proper to each also correspond, as the one below subsists by means of the one above it in the series. Of significance here is that all of the elements of the series are on the same (natural) plane. Then follows a discussion of the correspondence between elements in a series of mental to natural, and the possibility is finally raised of a ladder of correspondences reaching to the soul itself. But the "universal mathematics" necessary to make this jump goes beyond the doctrine of degrees, and has yet to be worked out. Here is the doctrine of correspondence in potential, incomplete, and yet to be perfected.

to a spiritual/natural nexus. In concession to the transcendent nature of this conjunction, he says here that there “is no analysis and no abstraction that can reach so high . . .” It is “infinitely above the sphere of the human mind.”⁵⁹ The scientific method could not reach above its limits to find the soul.

In a final restatement of this disappointing observation, Swedenborg closes his *Rational Psychology* by reluctantly admitting that this knowledge of correspondences,⁶⁰ which “has hitherto been unknown to the world,” is still beyond his grasp. “. . . There are many rules to be premised, data to be set forth, and truths to be connected together before I can undertake the task For this reason I forbear to make the attempt.” He promises instead another, future book, “which more surely and quickly leads us into hidden truths.”⁶¹ Unknown to Swedenborg at this time, a complete doctrine of correspondences was not to come at all, by any amount of mental effort or analysis. What was to come was spiritual crisis, and a period of failure and doubt, followed by the answer he could not obtain—revealed at last in unifying spiritual visions of ultimate reality.

Revelation

This unifying vision would not be an instantaneous flash of insight, but the wisdom of continuous, cumulative experience in the spiritual world. Here Swedenborg saw the connections, the relationships of things with other things, and haltingly at first, he began to see what his natural eyes had not seen before. In his visions of “man the microcosm” of the cosmological macrocosm, or *Maximus Homo*, he saw the nexus, and in doing so, he found his correspondences; but he found more than this. The contiguum, and the finest things of nature were there, but they are no longer the center of his attention. Instead of the bloods, the membranes, the fibers and the cortical substance, he now tells us that

The soul, which lives after death, is the spirit, and is in complete form a person; the soul of this form is the Will and the Understanding, and the soul of these is Love and Wisdom from the Lord.⁶²

59. Swedenborg, *Rational Psychology*, §§ 251–52.

60. The doctrine is referred to here as a “universal mathesis.”

61. Swedenborg, *Rational Psychology*, § 576.

62. Swedenborg, Emanuel, *Divine Love and Wisdom*, Swedenborg Foundation, New York, 1988, § 394.

In further application of this enlightenment, Swedenborg redefines the soul, its domain, and its operation in the natural body, and thus *from experience*,⁶³ finally defines his unifying doctrine of correspondence:

Before any statement can be made about influx and the operation of the soul into the body, it must be well understood that the internal man is formed according to the image of heaven, and the external man according to the image of the world; insomuch that the internal man is a heaven in the least form, and the external man is a world in the least form, thus is a microcosm. That the external man is an image of the world, may be seen from the external or bodily senses; for the ear is formed according to the whole nature of the modification of the air; the lungs according to the whole nature of its pressure, as also is the general surface of the body, which is held in its form by the circumpressure of the air, and so on.

From all this 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. All this shows the nature of the intercourse of the soul with the body, namely, that properly it is the communication of spiritual things which are of heaven, with natural things which are of the world, and that the communication is effected by means of influx, and is according to the conjunction.⁶⁴

Using the familiar subject of the human body for his model, and a mystical image of the heavens in human form for his evidence, he shows the correspondences at work. Not surprisingly, sense-data and spiritual experience combined to perfect the doctrine of the two worlds, and a new philosophy was born to serve them both.

63. Of particular interest here is the audacity of Swedenborg to give spiritual experience the same weight as natural, sense-based experience. This is the prevailing character of his theological Writings, as compared with the methodical empiricism of the scientific works, but he does not abandon empiricism altogether; observations from spiritual experience and conclusions drawn from them are expected to square with the sense-data of this world, as both represent two poles of the same reality. This might be considered a *radical empiricism* of sorts, applied out of the necessity to deal with the spiritual experiences that informed Swedenborg's theology.

64. Swedenborg, Emanuel, *Arcana Coelestia*, Swedenborg Foundation, New York, 1984, § 6057.

What has been said may be seen in a kind of image and thus corroborated by the correspondence of the heart with love and of the lungs with the understanding. For if the heart corresponds to love, its determinations, which are arteries and veins, correspond to affections, and in the lungs to affections for truth; and as there are also other vessels in the lungs called air vessels, whereby respiration is carried on, these vessels correspond to perceptions. It must be distinctly understood that the arteries and veins in the lungs are not affections, and that respirations are not perceptions and thoughts, but that they are correspondences, that is, they act correspondently or synchronously; likewise that the heart and the lungs are not the love and understanding, but correspondences: and inasmuch as they are correspondences the one can be seen in the other.⁶⁵

These correspondences will not be found with the microscope, or teased out with the dissection needle. They are beyond the senses, and yet they can be seen by the eye of reason as central to the operation of all things of the universe. This is no exercise in semantics. Swedenborg is introducing us here to a new way of doing science, by assigning sensory proofs to the realm of the senses, and the comparison of those premises that rise above the senses to the realm of reason. Taken together, this method allows the use of a single model to address all levels of reality. For a theistic scientist, this means a single method for investigating all things.⁶⁶

Norman Newton brings the necessity for such a method into focus, in an endnote to Chapter Six of *The Listening Threads*:

The renowned Soviet cosmologist, Otto Schmidt, wrote in the 1950s that “Scientific cosmogony begins with the well-known works of Kant (1755) and Laplace (1796). They were the first to propose hypotheses concerning the formation of the solar system out of scattered matter; they regarded it as a regular development of matter that follows the laws of nature and did not need the help of divinity” (Schmidt, p. 11). Note the concluding clause. Schmidt is in complete accord with his Western fellow-scientists in the assumption that a cosmogony which requires “the help of divinity” is not to be considered

65. Swedenborg, *Divine Love and Wisdom*, § 412.

66. This is no small consideration. The anti-metaphysical bias of scientists since the Enlightenment disqualifies on its face any appeal to spiritual cause, without consideration of its merits. The most charitable suggestion comes from Stephen J. Gould’s allowance of NOMA, the “non-overlapping magisteria” of science and spirituality: I can do science and I can do theology, but not at the same time, and never the twain shall meet.

true science *even if it is scientifically correct*. The laws of nature are, implicitly but irrevocably, to be separated from the creative intent of any divine being.⁶⁷

With correspondences, what had been Swedenborg's greatest challenge became his *conatus* into a frame of reference where the spiritual causes of natural truths were accessible.

A PERSPECTIVE ON SWEDENBORG'S CORPUS

Swedenborg's works, then, from his earliest scientific treatises to the final volume of his theological Writings, may be viewed as a cumulative blend of elements. They are constructed partly on applied philosophical truths derived from several identifiable sources, certainly including Plato and Aristotle, and most obviously those of Descartes, Leibniz, and Wolff. There are also many basic concepts which appear to be original with the author, developed and perfected from his earliest scientific works to serve as foundations for the great theological doctrines to come. Examples of these presented here were the binary nature of matter, the *contiguum* of anatomical components, degrees, forms and finally correspondence.

It was this doctrine of correspondences, and also the concept of the *maximus homo* or "universal human" which were shown to be of another, very different nature. These ideas were not direct extensions of Swedenborg's scientific analysis or philosophic argument. In fact they would not, despite his greatest intellectual efforts, come at all. These principles would come only from divine inspiration, in a spiritual vision of creation, which made obvious those things obscure in natural light. Not doctrines of peripheral interest, these principles govern all others, and in fact are essential to any understanding of them. This was indeed the *universal mathesis*, delivered—not derived—to complete the process started so long before.

From such a perspective, it becomes unimportant to cling dogmatically to any preconceived notion of divine inspiration as exclusive of any natural effort or design. Revelation, or revealed truth, is spiritual truth revealed by

67. Newton, Norman, *The Listening Threads*, Swedenborg Scientific Association, Bryn Athyn, Pennsylvania, 2000, end-note to Chapter Six, pp. 181–82, citing Schmidt, Otto, *A Theory of Earth's Origins*, tr. By George H. Hanna, Foreign Languages Publishing House, Moscow, 1958.

any means whatever, in any combination of methods necessary to bring it into natural light. That it comes through human instruments is proof enough of this.⁶⁸ According to Acton,

. . . we cannot go to [Swedenborg's] philosophical works for instruction in spiritual subjects, but we can in those works follow the development of his mind, and see the gradual growth of these natural ideas which prepared him for his mission. Though before his illumination, Swedenborg did not see the truth respecting spiritual causes, yet it is evident that he had clear basic philosophical ideas which brought him to an obscure perception of higher things, and prepared him to receive them later. And we may surely take it for granted that that which thus prepared Swedenborg, when studied by us in the light of revelation, will establish spiritual truth more clearly in our minds, by affording us invaluable illustrative and confirmatory ideas.⁶⁹

The form and origin of Swedenborg's theological Writings are testimony to the appropriate contributions of intellectual preparation, physical effort, and finally divine inspiration in crucial combination, which together produced a unified spiritual and natural new philosophy.

The unsettled question that follows from this historical treatment of Swedenborg's science is one of utility: How are we to receive this corpus of eighteenth century science? As provocative and prescient as it may be, no one would disagree that it is still light-years behind the elegant science of today. Much of it is clearly wrong. Is there any use for this material beyond its purely historical value? The answer is clearly no, if it is only the history of science that we are seeking in these works. If, however, we are seeking the method of an inspired scientist who was laboring under the constant denial of his basic premise—that of the spiritual causes of natural things—then these scientific works have much more to offer, because we need such a theistic method now. The large number of books on the broad topic of "science and religion" over the last two decades attests to this sense of need.

Swedenborg was doing the "modern" science of the early Enlightenment, in the emerging context of a new and powerful sentiment that argued against

68. Acton, Alfred II, "Paradigms of Revelation," *New Philosophy*, January–June, 1991, pp. 489–506.

69. Acton, Alfred II, in Preface to Swedenborg, Emanuel, *Ontology* (1742), Massachusetts New Church Union, Boston, 1901, p. xv.

the necessity of final cause. Spiritual reality was dispensable in this new world of empiricism and skepticism that was rapidly leading to the scientific materialism of our modern age. What makes Swedenborg unique is that despite the quaintness of much of his science from the retrospective of 250 years, his method remains valid, and serves as an inspiration for researchers to carry on this work today. This method was unapologetically theistic in its form; his research rested firmly on the axiom of the two worlds to explain the phenomena of nature. Since to him natural things clearly have spiritual causes, his discoveries proceeded from this premise as rational expressions of it. And by operating from this perspective he demonstrated for all to see, an original and intellectually defensible method of doing science for a world of purpose and design.

Wilkinson, a nineteenth century Swedenborgian scientist and physician, offers his own perspective on Swedenborg's scientific corpus as unique among practitioners of Western religion. Arguing that traditional Christianity could not produce such ideas, he characterizes Swedenborg's works as a rational revelation, that will eventually prevail in the arena of ideas. These ideas, he says,

... are throwing their bridges over now (1876) into the hostile cities of science. The New Jerusalem is constrained to occupy this position, because no other church can do so. All other churches are possessed by mythologies which do not belong to the rational mind, and which can throw over no bridge into accordant truths of nature. There is nothing organic, no apprehensible divine truth in their tenets . . . At best they are the formulas of public opinion about divine things, old and new . . . Obviously they are unrelated to science; when it becomes atheistic, they can parry none of the attacks; for their theism is as unlikely as its atheism . . . True science is indispensable in work, and divine in origin; and true theology must be able to throw over bridges into it, and to communicate with the heart of its truths; and if there is no such theology in [those other churches], it must be sought in the New Jerusalem Church.⁷⁰

What follows is a treatment of Swedenborg's method on three levels. First, a comprehensive look at his system as method is in order, to substantiate

70. Wilkinson, James John Garth, *On Human Science and Divine Revelation*, James Speirs, London, 1876, pp. 208–209.

the claims just made. We have seen the historical context for the doctrines that would drive his investigation into the nature of spiritual-natural reality—his unique place in the history of ideas, his insistence on retaining spiritual causality in his cosmology, and his untiring search for the nature and operation of the soul. Was he able to lay down a plausible spiritual-natural paradigm that effectively explains observed phenomena? And how did he come to the major discoveries that comprised his theistic paradigm? We will return to these doctrines, to watch them emerge, in linear fashion, each from the necessity of previous discoveries, and the new questions that they posed. At that point, we will assemble Swedenborg's complete system of nature, ready to be put to use.

At the final level we do just that, turning this system to the unsettled biological science of evolution—driverless and random, we are told, and yet so curiously orderly in operation. As a means to verify Swedenborg's theistic science as a method valid for the present, an open question in contemporary science will be subjected to this method: Can novel organic forms (new species and morphological diversity) be generated by natural processes alone, or is some spiritual-natural interaction at work within the mechanism of evolution? Is evolution by accident or design? Or is this a false dichotomy, blocking our progress towards a new, third way, that might satisfy both extremes? The perennial question of form provides an excellent venue to test our eighteenth century system in a twenty-first century way. Is there a new philosophy?

But before we proceed to this pragmatic work of a new science, we must first examine the spiritual environment that formed the man who could see three hundred years ahead. From all reports, Swedenborg was pleasant and calm, even stolid, as he worked quietly alone, against the limitations of a lifetime's agenda; his work required great patience and perseverance. But his internal world was quite a different story, as he worked among powerful but unseen currents of spiritual change that would soon irrupt in a tidal movement, the likes of which had not been seen since advent of the Lord. Tentative at first, but increasingly aware of the movements around him, he slowly responded to what he believed to be a call, to move his science to a close and adapt his program of discovery from natural to spiritual reality. And as he assented to this command, he was witness to a remodeling of the spiritual world by what he subsequently reported to be the Last Judgment,

foretold in John's *Revelation* as the New Jerusalem come down to Earth. The spiritual currents before, during and after this seminal event provided the backdrop to Swedenborg's life, from young philosopher to mature scientist to visionary theologian. His life's work was inexorably bound to and driven by it. Without a thorough treatment of this level of his existence, we cannot fully appreciate his inspiration.

INTELLIGENT DEFAULT: CHAPTER TWO
SPIRITUAL CURRENTS:
THEISTIC SCIENCE, SCIENTIFIC MATERIALISM,
AND THE NEW JERUSALEM COME DOWN TO EARTH

Emanuel Swedenborg entered the Western intellectual tradition at a time of unprecedented cultural upheaval. The Renaissance had provided the power of human reason to fuel yet another revolution, this time of science, engineering and empiricism, that would produce the blessings and afflictions of the Industrial Revolution, along with a new sense of skepticism that would shape the modern world. Born in 1688, he is a pivotal figure of this Enlightenment, first as a receiver of Francis Bacon's *Novum Organum* of 1620, second as a contemporary of the freedom movements inspired by the Natural Law philosophy of Rousseau, Montesquieu and Locke.⁷¹ Less obviously but most significant of all, he was a participant in the greatest upheaval of the previous 2,000 years: it was Swedenborg himself who proclaimed 1757 as the year of the long anticipated Last Judgment, foretold in the *Revelation* of John as the descent of the New Jerusalem. But this Last Judgment was a spiritual phenomenon, he explained, taking place in the spiritual world, and not the natural world of Christian expectations. These cataclysmic changes on three fronts came together in the consciousness of this remarkable man, whose research and writings would set about to interpret their meaning and purpose. We cannot fully appreciate his ambition or his achievement without a thorough understanding of this momentous event.

71. Natural Law, Britannica Online Encyclopedia, retrieved January 10, 2013, from <http://www.britannica.com>.

THE CASE FOR THE LAST JUDGMENT

The search for signs of the New Jerusalem in the natural world following the Last Judgment of 1757⁷² cannot begin with that event. We must start with a prologue to establish the natural world context into which this event descended. Without this perspective the Last Judgment makes no historical sense, and might appear to have no logical cause at all.

We start not with the Last Judgment of 1757, and not with Lord's⁷³ first advent into the world either, but at the beginning of the human narrative, with the first "last judgment," of *Genesis* Chapter 3—the fall of the human race into the knowledge of good and evil. After being reassured by the serpent that she "would not surely die" were she to eat of the tree of the knowledge of good and evil, Eve does just this; and the die is cast for the long redemptive struggle of the fallen human race.

... the Lord God said to the woman, "What is this you have done?" The woman said, "The serpent deceived me, and I ate." So the Lord God said to the serpent: "Because you have done this, You are cursed more than all cattle, and more than every beast of the field; on your belly you shall go, and you shall eat dust all the days of your life. And I will put enmity between you and the woman, and between your seed and her seed; He shall bruise your head, and you shall bruise His heel."⁷⁴

Swedenborg explains the spiritual meaning of this passage as the earliest prophecy of a Redeemer⁷⁵ who would come into the world, in answer to the devolution, over time, from the "knowledge of good and evil" to immersion

72. This refers to the Swedenborgian doctrine of a spiritual Last Judgment, foretold in the *Revelation of the New Testament*, as an accomplished event which occurred in the spiritual world in 1757, as reported by Emanuel Swedenborg in *The Last Judgment* (1758) and other works.

73. Based on Swedenborg's explanation of the Godhead as a trinity of three essentials of a single God, "Lord" becomes a technical term of sorts, which can mean either God the Creator or Christ the Redeemer. Since both represent the same divine entity, the term applies to both. This does not present confusion once the concept is fully understood. See Chapters 1-3 of Swedenborg's *True Christian Religion* (1771) for a complete explanation of this doctrine.

74. *Genesis* 3:14-15 *Holy Bible* (New King James Version)

75. See *Arcana Coelestia* §§ 250–260 for Swedenborg's exegesis of *Genesis* 3:15, with a detailed exposition of the internal, spiritual sense, by means of the spiritual-literal correspondences embedded in the passage.

into evil itself.⁷⁶ What happens here will eventually require the first advent of the Lord; and we find that something like this will happen again, at the end of the Christian Church, necessitating yet another coming of the Lord into the world. These first two events are described in Swedenborg's *Arcana Coelestia* § 2034:

After everything celestial with the human race perished, that is, all love to God, so that as a result the will for what is good existed no longer, the people were separated from the Divine. For nothing other than love effects conjunction, and when love has been reduced to nothing, disjunction has taken place. And when the latter has taken place destruction and annihilation follow. At that point therefore a promise was given concerning the Lord's Coming into the world, who was to unite the Human to the Divine, and by means of this union was to join [to the Divine] the human race that was abiding in Himself through faith grounded in love and charity. From the time of that first promise given in *Genesis* 3:15, this kind of faith in the Lord who was to come was conjunctive. But once faith springing from love did not remain any more in the world the Lord came and united the Human Essence to the Divine Essence so that these were completely one, as He Himself states explicitly. At the same time He taught the way of truth to the effect that everyone who believed in Him, that is, who loved Him and what was His, and who abided in His love, which is a love directed towards the entire human race and so towards the neighbor, would be conjoined and thus saved.

With the addition of the Last Judgment of 1757 to these two other spiritual branch points, the idea of redemption emerges not as a single historical event, but as a cyclical phenomenon over time, with smaller cycles within the larger ones, of falling away and covenant renewal. In order to square with human experience, our spiritual history is better viewed from the perspective of this complex process. According to this interpretation, the Last Judgment of 1757 was not an isolated event, but was rather the culmination of a chain of identifiable spiritual and natural events from the earliest days of human history.

76. For an explanation of this descent into evil along a "slippery slope" from doubt, to denial, to defiance of what is good and true, see Swedenborg's *Conjugal Love* § 444.

THE EFFECTS OF THE FIRST ADVENT

The most fundamental outcome of the first advent was the Glorification of the Lord's Human, occurring at his resurrection.⁷⁷ Returning to *Arcana Coelestia* § 2034, we learn the significance of this event.

Once the Human had been made Divine, and the Divine made Human in the Lord, an influx of the Infinite, or the Supreme Divine, took place with the human race which could not possibly have manifested itself in any other way. Also by means of that influx the dreadful false persuasions and the dreadful desires for evil were dispersed with which the world of spirits had been filled and was constantly being filled by souls streaming into it from the world; and those who were actuated by such persuasions and evil desires were cast into hell and so separated. Unless this had been done the human race would have perished, for it is by means of spirits that the Lord rules the human race. They could not have been dispersed in any other way because there was no activity of the Divine by way of a person's rational concepts into their inner sensory awareness, for these are far below the Supreme Divine when not so united.

This Last Judgment brought about a housecleaning in the spiritual world: the world of spirits was cleared of its overflowing stock of evil denizens, and a separation between heaven and hell ushered in a new spiritual order. This produced a beneficial effect on the natural world as well, as peoples' minds were no longer subject to the involuntary influence of evil spirits. Of equal importance was a development that is often overlooked: a higher degree of freedom was a part of this new order—an emergent human trait that would play an essential role in a spiritual judgment yet to come.

The Glorification served as a major preparatory step for this judgment to come. "Heaven and earth" were now truly conjoined, the "earth" no longer a level of spiritual-natural reality in potential, but brought fully into

77. The enormity of this fact of Glorification startled Anglican minister John Clowes (1743–1831) into an almost Pauline conversion to the New Jerusalem Church—a spiritual epiphany on the significance of *Divinum Humanum*, which led him to become a patriarch of the early church in England. This story was related in an address by the Rev. Samuel Noble in 1831 and preserved in Tafel, R. L., *Documents Concerning the Life and Character of Emanuel Swedenborg*, Swedenborg Society, London, 1877, Vol. II, Part II, pp. 1166–1168.

the contiguum of creation. The mechanism of this conjunction was spiritual influx, with natural afflux in reciprocation.⁷⁸

What changed? In the natural world, all the earth, from its subatomic particles to the human mind, as a result of this change in natural matter itself. This is a pivotal concept without which we cannot proceed, best explained by means of a series of premises: We learn first that there are three discrete degrees of operation in God the Creator. Swedenborg calls these “degrees of height,” although this allusion to geometry is just a teaching aid; they could just as well be degrees more and less interior.

There are three infinite and uncreated degrees of height in the Lord, and three finite and created degrees in people. These three elements constitute the three degrees of height in living entities. The three are analogous to the first end, the intermediate end, which we call the cause, and the last end, which we call the effect.⁷⁹ (DLW § 230)

Then we learn that these same degrees are inherent in human beings, as creatures made “in the image and likeness of God.”

That in humans there are these three degrees can be seen from the elevation of their minds even to the degrees of love and wisdom in which angels of the second and third heavens are; for all angels were born people; and people, as regards their interiors pertaining to their mind, are each a heaven in least form; therefore there are in the human being, by creation, three degrees of height as are heavens. Moreover, a person is an image and

78. “Spiritual Influx is the Divine Proceeding, and is the Lord Himself, Omnipotent, Omniscient and Omnipresent. This process is implied by the term “flux,” which means ‘to flow’; from this are formed such words as ‘afflux’ (flowing toward) ‘efflux’ (flowing from), ‘transflux’ (flowing through), and ‘influx’ (flowing into), all of which are applied to the Divine Proceeding.” (Rev. T. S. Harris, *New Church Life* in 1938, p. 345.) There is an essential spiritual mechanism at work here that will become important in the discussion of the emergence of organic forms to follow. Swedenborg in very many places speaks of the inflowing of spirit (*influx*), into non-living nature, into living organisms and into human beings on both natural (body) and spiritual (mind) levels. In other places he describes a reciprocal, natural-to-spiritual attraction, called *afflux*. The spiritual importance of this to humans is the equilibrium this dynamic affords for the maintenance of free will. On the subhuman level, this reciprocal dynamic is implicated in the emergence and maintenance of form, as a reciprocation of natural matter at its minutest level “rising” to meet “descending” spiritual substance, one essential of which is form.

79. Swedenborg, *Divine Love and Wisdom*, § 230.

likeness of God; consequently these three degrees have been inscribed on them, because they are in God-Man, that is, in the Lord.⁸⁰

At issue is how these degrees of spiritual-natural reality appeared before and after the Lord's advent into the world, and then after his Glorification, at the resurrection. This is central to our understanding of how not only human nature was changed, but how nature itself was transformed, from being an intermediate receiver of spiritual influx, through the angelic heavens, to a receiver of direct influx from the Lord himself.

Before the Lord from eternity (who is Jehovah) took on a human nature in the world, the first two degrees existed actually, and the third degree potentially, as they do also in the case of angels. But that after assuming a humanity in the world, He put on in addition the third degree as well, which we call the natural, so that He became in consequence a man like any other in the world. Indeed, the Divine which previously filled every space and interval of space in the universe independently of space did enter into and permeate even the outmost levels of nature. Before His assuming a human form, however, the Divine influx into the natural degree was conveyed indirectly through the angelic heavens, whereas after His assuming a human form it flowed directly from Him.⁸¹

The *Arcana Coelestia* extends this progression by explaining the nature of this pre-advent state.

Prior to the Lord's Coming the Divine Human was Jehovah in the heavens; for it was by His passing through the heavens that He presented Himself as a Divine Person before the eyes of many on earth. In those times the Divine Human was not so much one with the Divine Himself, called the Father, as when the Lord had made the Divine Human within Himself completely one with the Father.⁸²

What was lacking here was the fullness of ultimates; what remained to be accomplished was the complete structural and functional series of end, cause and effect, linking *Esse* above the heavens with *Existere* (*Esse* going forth in creation), and finally, this same Lord a natural man.

80. *Ibid.*, § 231.

81. *Ibid.*, § 233.

82. Swedenborg, *Arcana Coelestia*, § 6000:7.

Before the Lord's Coming, whenever Jehovah passed through heaven He appeared in human form, as an angel; for heaven as a whole resembles one entire human being, called the Grand Man. When therefore the Divine Himself passed through heaven He appeared in human form, as an angel, before the eyes of those to whom He spoke. This was Jehovah's Divine Human before the Lord's Coming. And the Lord's Human, having been made Divine, is also Jehovah's Divine Human, for the Lord is Jehovah Himself in the Divine Human.⁸³

Hindmarsh⁸⁴ touches on the significance of this principle when he explains, by way of a discussion of human spiritual regeneration, how new substances and forms—untainted by the imperfections in the natural person—are necessary to produce the “new man.” Considering the above principles, there is an analogy here for the coming-into-being of new natural substances and forms as well.

It follows, therefore, that the Divine Natural Substance, which had been such from eternity, yet rather *potentially* than *actually*, and came forth from the Father, to be made actual in the Person of the Lord during his pilgrimage on earth, was never contaminated by the evils of the human race.

For the same reason, if new powers, qualities, and properties, are to be insinuated into any subject of intelligence, such an effect can only be produced by the actual introduction of a new substance and a new form, in which they already inhere, and from which they can never be separated, so as to become the properties of any other form, or any other substance.

There is the suggestion here of forms—both spiritual and natural—following the same principles of origin. For the spiritual, the resulting form is the “new man,” of regeneration; for the natural, this might well be the introduction of new organic forms.

83. *Ibid.*, § 6831.

84. Robert Hindmarsh (1759–1835) a printer, was the founder of a Swedenborgian reading group in London in 1783, that would grow to produce “Swedenborgianism” in the world, and the New Jerusalem Church in England, and later the United States and Australia. At the end of his life he published a comprehensive study of the Lord's Glorification, in an attempt to settle, once for all, the question of the actual nature of the Lord's body with which he arose from the grave. See Hindmarsh, Robert, *An Essay on the Resurrection of the Lord; An Humble Attempt to Answer the Question, With What Body Did the Lord Arise From the Dead?*, J. S. Hodson, Printer, London, 1833, p. 195.

What changed? On the spiritual level, a new degree of intellectual influx could now descend fully into the mind, to bring a new level of understanding, both spiritual and natural. The *New Testament* was a new kind of revelation for this new era, accommodated to this new kind of mind. This brought about a new level of freedom—“ . . . if you continue in My Word, then you are My disciples indeed, and you shall know the truth, and the truth shall make you free. . . .”⁸⁵—and the stage was set for a new, Christian era to begin. But because of the very nature of freedom itself, what brings the great good of human potential, can also bring great calamity. Swedenborg plainly states that “the origin of evil is in the abuse of the faculties proper to man, called freedom and rationality.”⁸⁶ This radical change at the first advent opened the door to the “destruction and annihilation” described in AC § 2034 above, necessitating the second advent. Freedom is a volatile element; it presents challenges wherever it goes. As we shall see, it is freedom that becomes the driver of the Lord’s second advent, and the essence of the New Jerusalem itself.

So now there was a fully functional middle place for the human being to stand, with the spiritual mind and natural body fully united in unanimous action. The Lord’s Glorification set the stage for a new level of inspiration for the arts and sciences of the New Christian Era to come. Swedenborg was convinced that he was working within this new spiritual context, and his every effort was inspired and colored by it.

The stage is set: with freedom comes a burst of human spiritual development and the rise of naturalism to counter it. At work here is the perennial tension between good descending into the world and evil rising up to meet it.⁸⁷ Swedenborg made dire predictions about naturalism, the intellectual offspring of the Enlightenment, that promised even then to be the corrosive force it has now become.⁸⁸ The great good of the New Jerusalem descends into the midst of an impressive alliance of opposing forces, and the

85. *John* 8:32 *Holy Bible* (New King James Version).

86. Swedenborg, *Divine Providence*, § 15.

87. See Swedenborg’s Writings for the New Church on the concept of spiritual equilibrium. The mechanism involves evil at work in the world, but in the Lord’s divine providence this evil is put to use as one of two equalizing forces allowing a person complete freedom to move towards good or evil. Central teachings include AC 1857, 3628; HH 292, 293, 541, 593, 594; LJ 33, 34; TCR 475–78.

88. “Naturalism” is a belief about the universe that springs from an axiom that says “all nature is from nature.” See AC 3024:4, 3108; AE 575; CL 415; TCR 13:4, 75:7, 339, 771, and SBI 2 for core teachings on the threat of naturalism, and its potential for harm to human culture.

intellectual, political, and religious landscape of our world is transformed by the apocalyptic struggle that has finally come.

After the first advent and a good three-hundred year start came the slow, steady spiritual decline of the Christian Church. In place at its vastation⁸⁹ in 1757 was the new era of freedom foretold in John's *Revelation*, finally come to pass with the descent of the New Jerusalem. But it was not readily visible to the natural eye. The "kingdom of heaven" had come, but it did not meet the expectations of the Christian world—this "kingdom" was the Lord's new church on earth, and nothing more; and the existing churches had not ostensibly changed at all. Science had made marvelous progress, but was losing its moorings to spirit. In constructing a method for getting at natural truth by combining inductive reasoning with empirical investigation, Francis Bacon's *Novum Organum* (1620) removed Aristotle's *final cause*⁹⁰ from his new, "scientific" chain of cause and effect alone, and naturalism was strengthened by this new authority.

Of Aristotle's four causes (material, formal, efficient, and final), it was the final cause that reflected a thing's purpose, or reason for being. As this involved subjective speculation, Bacon abandoned it in favor of only those attributes than could be confirmed by objective observation. This made good sense for his new method at finding truth, but its unintended consequence was the separation of the metaphysical from all scientific considerations. A methodological formality at first, this denial of spiritual cause would become a *shibboleth* for the new scientists of the day, and usher in an era of emboldened Naturalism.

Creatio ex nihilo became the axiom of the day, and all things of nature were now from nature alone. His own religious beliefs notwithstanding, René Descartes' *radical skepticism* helped fuel this secular departure, and the stage was set for the Enlightenment to finally do away with spiritual connection altogether. It was precisely at this time that Swedenborg saw

89. Here is another familiar word that becomes a technical term in Swedenborg's system, variously used to denote desolation, despair, or a consummation. A state of vastation is a spiritual nadir, from which an individual, a nation, or the entire human race has the opportunity for redemption. Bogg, John Stuart, *A Glossary of Specific Terms and Phrases Used by Swedenborg* (1915), The Swedenborg Association, Bryn Athyn, Pennsylvania, 1994.

90. See Aristotle, *Physics* Book II, Ch. 3 and *Metaphysics* Book A, Ch. 3 for his complete treatment of these philosophical concepts. Barnes, Jonathan, *The Complete Works of Aristotle*, Bollingen Series 71:2, Princeton University Press, Princeton New Jersey, 1984, pp. 332–334 (*Physics*), pp. 1555–1557 (*Metaphysics*).

and reported the dawn of another era, that could finally apply a rational, spiritual/natural model to the sublime natural philosophy of a future day. There was a growing need to repair the rift between science and religion,⁹¹ and the New Jerusalem he proclaimed was coming down to do that work.

EFFECTS OF THE SECOND ADVENT

So the Last Judgment of 1757 seems to have appeared right on schedule, and just as Swedenborg observed, all those apocalyptic images of John's *Revelation* did come to pass. But how were these events in the *spiritual* world manifested in the *natural* world of human experience? Almost not at all. The descent of the New Jerusalem into this world is gradual, cumulative, and spiritual, and not overtly natural at all. But in practical human terms, *spiritual* translates to *mental*, as the highest degree of the human mind is spiritual in structure and in function. This fact will eventually emerge as the solution to the problem. The New Jerusalem steps down from heaven, through the successive degrees of the human mind, to find expression in the natural world of experience.⁹² Swedenborg explained this "trickle-down" process in terms of a gradual emergence of a New Church⁹³ on

91. At this point the new science of the Enlightenment and the dogmatic religion of the day had grown apart, primarily from science's rejection of final cause, and religion's devotion to biblical literalism. This divide was functional at first, resulting not so much from aggressive rejection, but from misunderstood intentions on both sides. Furthering this division was the secondary competition for influence, on government, on economic life, and on issues of morality. These two camps eventually came into conflict on all cultural fronts, and this would ultimately give way to the open hostility of each to the other in the modern era. As we shall see in this section, a lot of misplaced energy goes into maintaining this hostility in the twenty-first century.

92. The human mind exists as a series of degrees or levels, from celestial to rational to sensual, across which spiritual substance is able to interact in an orderly manner with the natural matter of the brain. The crucial mechanism is the operation, by spiritual/natural correspondence, between these two levels. See *AC* 1999:3; *ISB* 8:4; *DP* 220:3; *TCR* 8; *HH* 39; *LJ* 25; *SE* 5548; *WE* 919. The best summary of the multi-level structure and function of the human mind is found in Odhner, Hugo Lj., *The Human Mind*, Swedenborg Scientific Association, Bryn Athyn, Pennsylvania, 1969. See also Bell, Reuben P., *Swedenborg's Mind*, in Appendix A for a detailed discussion of this concept essential to Swedenborg's model of spiritual-natural interaction.

93. The term "church" here assumes a specifically Swedenborgian definition as a historical era of spiritual progress involving the whole human race. For Swedenborg, human spiritual perfection has progressed through a series of developmental stages he called churches, culminating in the Church of the New Jerusalem. See *AE* 20, *HH* 28, *SS* 79.

earth as a function of the gradual replacement of the Christian church by the descending New Jerusalem.

It is in accordance with Divine order that a new heaven should be formed before a new church is established on earth, for the church is both internal and external, and the internal church makes one with the church in heaven, thus with heaven itself; and what is internal must be formed before its external, what is external being formed afterwards by means of its internal . . . Just so far as this new heaven, which constitutes the internal of the church with man, increases, does the New Jerusalem, that is, the New Church, descend from it; consequently this cannot take place in a moment, but it takes place to the extent that the falsities of the former church are set aside.⁹⁴

In terms of everyday experience, the world went right on with its vastated business, while the Last Judgment silently came and went. But just as in the first advent, things changed, and the world would never be the same. What was now descending into the highest degree of every human mind would gradually find expression in a rapid succession of radical ideas that would change the world forever.

What changed? In the “judgment” of the Lord’s first advent it was the nature of matter itself, which effected a change in the substance of the brain as physical platform for the mind.⁹⁵ This judgment of the first advent set the stage for the last. The key to understanding the Last Judgment of 1757 is to see it as a mutation, not of matter (as in the first), but of human consciousness, operating above the level of matter. Human consciousness mutated into a contagious agent of spiritual change. Contagion progresses slowly at first, in a linear way, but will increase geometrically if the environment allows. According to the model for bacterial and viral growth, there is first a long lag phase with a gently upward-sloping curve. But with sufficient nourishment,

94. Swedenborg, Emanuel, *True Christian Religion*, (1771), Swedenborg Foundation, New York, 1850, § 784.

95. This is not the first time we have seen a change in the substance of the human brain: *Arcana Coelestia* § 4326:3 explains that after the fall into evil, the Lord effected a change in the human brain that brought about a reversal of the communicative pathways between cerebellum (the seat of the will) and cerebrum (the seat of the understanding). This represents a major developmental event in both the organic and spiritual evolution of the human being. It is of note that paleontologists mark the emergence of modern humans in part by their greatly enlarged cerebral hemispheres, a development that correlates with the increased intelligence of those of the genus *Homo*, compared with their ancestral forms.

and if other necessary environmental conditions are met, proliferation enters an exponential phase, with an almost vertical slope of astonishingly rapid reproduction. But despite the impressive outcome, the start is always very slow. And unlike the fate of natural organisms, the exponential phase of this spiritual agent need never end, since its nourishment is spiritual, and therefore infinite in supply.

SIGNS

What concrete historical events can be traced directly from causes put in motion by the Last Judgment two hundred fifty years ago? What has really changed from 1757 to today? It is much easier to see the things that have not.

Naturalism marches on, and it is developing a disturbingly militant edge. The world religions are no longer just the preoccupation of harmless, soft-headed delusion. Now they stand accused of being hazardous to the health of the human race, and are identified by some as the cause, not the cure, of human suffering. An impressive collection of atheist polemics has entered the marketplace of ideas, and religious writers have been put on notice that their irrational spiritual rambling will no longer be tolerated by the "brights" among us.⁹⁶

The traditional Christian worldview is ostensibly still in place; the church you drive by today will likely not be a Church of the New Jerusalem. Things still look the same. But this worldview has eroded, leaving an ambiguous, uncertain sense of where things are going, and little sense of purpose beyond the emotional, social and political. There is a great divide between the blind certitude of biblical literalism on one side, and the myopic solipsism of religion as consecrated social work on the other. The Christian compass appears broken, and as this becomes increasingly apparent in the Western culture, the brights are increasingly emboldened. In their defense,

96. Following the lead of philosophers J. L. Mackie and Daniel Dennett, mathematician Francis Crick and others, scientist-turned-polemicist Richard Dawkins has recently called for an end to all religions for the good of humanity. He calls himself and like-minded atheists "brights," (i.e., enlightened ones), and in his *God Delusion* (2006) we find not just hubris, but the rhetoric of an ideologue as well. This is new, and it heralds an unsettling change for future science-religion dialogue.

despite a number of good books by Christian authors,⁹⁷ they are hearing few credible answers to their reasoned scientific challenges to Christian faith.

Scientists continue to defend their rejection of Aristotle's *final cause* for natural things. Despite the significant epistemological challenges of causation being raised by emerging discoveries in quantum physics and biology, the questions of purpose for a natural thing remains a *non-sequitur* for a Dennett or a Dawkins. As anomalies of the New Science continue to accumulate, resistance to them becomes less reasoned and more emotional, less measured and more heated, less polite and more threatening. The temperature is rising in the rhetoric of some scientists, as they consider the increasingly tenuous nature of their old, comfortable, and neatly-limited Newtonian universe. Naturalism has traded detached condescension for a kind of reactive militance—a dangerous development for the new millennium. And yet, despite his distinction as ostensible spokesman for the cause, Dawkins' arguments against spiritual causes for natural things are surprisingly weak, consisting primarily of condescension, *ad hominem* attacks on his faith-professing peers, and the tired, old infinite regress fallacy⁹⁸

The dissolution of traditional institutions—academic, religious, governmental, and cultural—continues apace. Authoritative, hierarchical structures are breaking down. People who insist that they are “spiritual,” are

97. There is no shortage of excellent books making the case for spirituality in science. These authors offer valid arguments, from many different perspectives, for the operation of spirit in nature. What is generally missing, however, is attempts to answer specific questions of “how” when these arguments are made. “How are certain subatomic particles denizens of both worlds?” “How does the mind serve as the meeting place of body and soul?” “How did spirit irrupt into nature, causing something like a ‘big bang’ to begin?” “If there is an ‘Intelligent Designer,’ then *how* might this process actually work?” It is the premise of this study that there is a present need for this kind of conversation to begin. Once these ideas, however tentative, are presented, and reasoned responses begin to appear, then there can be a true dialogue between scientists and theologians.

98. Richard Dawkins, a brilliant evolutionary zoologist, has in recent years devoted his energies not so much to science as to the defense of it. As popular culture's ostensible spokesman for the causes of scientific materialism in particular and atheism in general, the arguments set forth in his recent *God Delusion* are surprisingly weak. Several powerful refutations of these arguments have been written. Suffice it to say that his best argument against an un-moved mover reverts to the simplistic fallacy of infinite regress. In this manner he argues that, given the incomprehensible complexity of the natural universe, God, if God existed, would by necessity be even more complex and improbable. In other words, if God created the universe, who then created God? And on and on . . . Respected philosophers were expecting more. (See Ward, Keith, *Doubting Dawkins: Why There Almost Certainly Is a God*, Hahn, Scott and Wiker, Benjamin, *Answering the New Atheism: Dismantling Dawkins' Case Against God*, and Gerhardt, Rick, *Dawkins' Ultimate Argument*, at <http://antiochapoletics.blogspot.com/2007/10/dawkins-ultimate-argument.html>.)

nonetheless staying away from the churches in droves; many meet in small groups, with no leaders at all. There is a healthy disrespect for government and the people who claim to run it, with a polarization in progress, between statisticians and those who see no validity to burdensome government. Civil disobedience is in the air. Education is increasingly an individual activity, with virtual classrooms and teachers on a screen. People are networking. And the Internet has brought a sense of horizontality to our culture and its institutions that have been hierarchical in form since the days of the Roman Empire.⁹⁹

Is this just destructive entropy at work in the world of human experience, or might this chaos represent something providential, and more optimistic, quietly at work? Concerning the descent of the New Jerusalem, the Lord clearly predicted, "Behold I am making all things new."¹⁰⁰ What would things look like if "all things" were being "made new"? Tranquil or chaotic? The Maggid of Mezerich¹⁰¹ made this observation about the mystical transformation of becoming new:

Before an egg can grow into a chicken, it must first totally cease to be an egg. Each thing must lose its original identity before it can be something else. Therefore, before a thing is transformed into something else, it must first come to the level of No-thingness . . .¹⁰²

For one brief moment, the old thing that is to become new is neither; it is lost in time . . . perhaps not really there at all. And to the casual observer, that no-thing state might look more like chaos than something becoming new.

These institutions and attitudes, though perhaps showing signs of stress, have remained in place since the Last Judgment of 1757; they did not abruptly disappear with the coming of the New Jerusalem. And yet, through

99. For a delightful yet discriminating look at this process as it is playing out on the world of business, see Brafman, Ori, and Beckstrom, Rod A., *The Starfish and the Spider: The Unstoppable Power of Leaderless Organizations*, Penguin, New York, 2006. These authors give clear examples from our culture of the demise of traditional, hierarchical forms, and the rise of horizontal, leaderless organizations in their place. To those who have eyes to see, there are spiritual implications to this phenomenon.

100. Revelation 21:5 *Holy Bible* (New King James Version).

101. Dov Baer (1710–1772), the Maggid of Mezerich, was chief disciple and public voice for Baal Shem Tov, the founder of Hassidic Jewish mysticism.

102. Epstein, Perle, *Kabbalah: The Way of the Jewish Mystic*, Shambala Publishing, Inc., Boston, 1978, p. 118.

the lens of Swedenborg's new revelation, and because they are showing stress, all of these can be held up as evidence for the New Jerusalem, slowly trickling into human consciousness.

Looking back 250 years with the clarity of Swedenborg's paradigm, we can begin to see the New Jerusalem at work in the world. The signs—radical cultural turning points that have coalesced to define our modern world—are there if we only wish to see them as providence at work. There are many, but a short list might include the Romantic Movement in the Arts; the freedom movements—from the American and French Revolutions to those that continue to the present day; the notion of individual freedom as an “inalienable right”; the autonomy of women, who were property only 250 years ago; and the death of slavery as a institution that abruptly went from “peculiar” to untenable; perhaps the most clearly visible manifestation of the New Jerusalem might be the Internet, the astonishingly rapid development of which denotes its relation to something very powerful in the spiritual world—an ethereal and almost spiritual thing, it is the essence of freedom in organic form; even the decline of the main-stream Christian denominations in the world—in numbers, in influence, and in doctrinal integrity—is evidence that the Last Judgment is finally breaking through their obsolescent ecclesiastical forms. These are all presumptive signs of the New Jerusalem, if an observer chooses to see them as such. To another observer, they might just be random events of history. Scientists may think that seeing is believing, but those with faith in operation understand that believing can allow them to see.

Some scientists, despite the reactive opposition of their orthodoxy, are quietly moving nonetheless towards the “omega point” of a new spiritual-natural axiom, with the final cause of creation restored. This began with particle physicists who could not explain what they were seeing in purely mechanistic terms. Reluctantly at first, they reported the necessity of certain particles—“force carriers” by name—to come and go from and to a different place than three dimensional space. They seem to “appear” and “disappear” as needed. New discoveries such as these require deeper explanations than Naturalism can supply, and the shift to this new axiom may finally be happening, from the logical necessity to explain what is observed. Deep science will finally meet the deep theology of the New Jerusalem, and the true purpose of the Last Judgment of 1757 will be revealed. No longer

separated from their spiritual roots and denied a final cause, scientists can now embrace the rationality of a new philosophy, and build a powerful new paradigm to accommodate both sensory experience and spiritual truth. The restoration of the left and right brain together in human intellectual activity—the *tikkun*¹⁰³ of the ages—is the coming of the New Jerusalem.

The signs are there to see. The pulse of human culture quickened in 1757, and the notion of human freedom, once radical, is commonplace today, in all its permutations. All things are becoming new—cultural forms and content, immediate communication, access to information, and a personal spiritual inclination of the human mind. But the science demands a deeper look.

Once separated from its spiritual roots and determined to maintain this separation, scientific discoveries themselves are causing scientists to rethink the separation. Causality is no longer a linear proposition, in a quantum universe with uncertain boundaries, and the simple state of being is not so simple any more. Science, calm and confident on its surface, is unsettled at its philosophical core; change (and the anxiety that comes with change) is in the air.

The separation of spirit from nature was the greatest calamity of human intellectual development, a product of the Enlightenment, curiously a period of great intellectual advancement. This has handed down to us a post-modern worldview of a purposeless, mechanistic universe, where humanity has no special status. Observing the fallout from this calamity, Einstein observed that “Science without religion is lame; religion without science is blind,”¹⁰⁴ but he offered no solution. Others have sensed the anxiety that this separation brings, but their suggestions tend to be sectarian and dichotomous; winners win and losers lose, and there is no *tikkun*. The key is

103. Restoration is a major theme of the Jewish mystics, from *Zohar* to Lurianic Kabbalah, and it is an ancient concept common to virtually all religions. From a starting point of unity, there is a separation from the Divine (*Shevirat ha-Kelim*, or the breaking of the vessels, in Kabbalistic lore). The central theme of spiritual transformation then becomes *tikkun*, the restoration of the pathways to the Divine. In Buddhism this is the delay in final liberation until all souls are free. In Christianity it is the coming of the Messiah. For the Gnostics it was the liberation of the Divine Spark, trapped in earthly bodies. In the New Jerusalem, an era of a rational spirituality, it becomes the restoration of the two receptacles of truth and good in balance, in the collective human mind, as science and spirituality are reunited in the new philosophy. Scholem, Gershom, *Major Trends in Jewish Mysticism*, Schocken Books, New York, 1974; *Tikkun Olam: the Spiritual Purpose of Life*, retrieved January 10, 2013 from <http://www.innerfrontier.com>.

104. Einstein, Albert, 1941, from *Science, Philosophy, and Religion, A Symposium*, in *The Oxford Dictionary of Quotations*, Oxford University Press, 4th Ed., p. 268.

restoring Aristotle's final cause with freedom built right in—spiritual truths accommodated to each person's place and state. This the New Jerusalem can do, when its universalizing principles of spiritual-natural correspondence are fully understood.

THE CULTURE WARS: A MESSAGE FROM THE FRONT

For a decade I taught in a typical American university, an institution that strongly favored the ideology of scientific materialism. Today's *scientific materialism* is a modern refinement of the Naturalism that Swedenborg predicted would worsen over time. In many places he warns of atheism coming into the world as the spiritual is separated from the natural, and people come to regard nature as the only reality.

The sensual person is in fallacies, because all the ideas of their thought are from the world and enter through the bodily senses; from these, therefore, they think and draw conclusions respecting spiritual things. Moreover, the sensual person does not know what the spiritual is, and believes that there can be nothing above nature, or if there is, that it is natural and material.¹⁰⁵

The more deeply we proceed into the knowledge of nature, the greater light do we come into, and as it were from the darkness of atheism and of naturalism into a knowledge of the deity, which we can thus in no way deny; thus natural philosophy will lead us truly to a confession of the infinite. All doubts and secrets lead us into devious paths; all opened things lead us into confession of God. That philosopher is unlearned and dull, and does not reach the threshold of true philosophy, who does not acknowledge God.¹⁰⁶

. . . to prevent people from plunging yet deeper into erroneous ideas about . . . the spiritual world, as the result of ignorance, which leads to worshipping nature and this automatically to atheism—something which at the present time has begun to take root in the inner rational minds of the learned—to prevent

105. Swedenborg, Emanuel, *The Apocalypse Explained*, Swedenborg Foundation, New York, 1850, § 575:4.

106. Swedenborg, Emanuel, *The Mechanism of the Operation of the Soul and Body* (1734), Swedenborg Society, London, 1965, § 23.

then atheism from spreading more widely . . . , I have been commanded by the Lord to make known various things which I have seen and heard. These include heaven and hell, the Last Judgment, and the explanation of Revelation, which deals with the Lord's coming, the former heaven and the new heaven, and the holy Jerusalem. If my books on these subjects are read and understood, anyone can see what is meant there by the Lord's coming, a new heaven and the New Jerusalem.¹⁰⁷

By either name, materialism is a way of life in the intellectual circles of academia, and it is gaining momentum, not just as an attitude, but as a movement. Traditional religion is withering before it, and there is a culture war brewing, against religion in general, and theistic science in particular.

Emanuel Swedenborg was born on January 29, 1688. Despite this considerable historical distance, by looking at Swedenborg the man and his scientific works before his theological writings, we find a powerful antidote to the Naturalism that still drives the learned world today. Naturalism is the belief that nature is from nature, and that science is the key to understanding all.¹⁰⁸ At my previous university this philosophy was the order of the day, and in this environment, in self-defense, I developed a method for talking to my fellow professors about how things work and how it is that from a scientist I could become a theologian. The "method" was there all along; it has been there for 250 years. But because of the unassuming appearance of Swedenborg's quaint Eighteenth Century science, it took me a while to see the forest for its trees.

107. Swedenborg, *True Christian Religion*, § 771:2.

108. Swedenborg used a simple working definition of naturalism as a belief that all nature was from nature, and warned of the consequential extension of this premise into atheism. Not surprisingly, since the Enlightenment this point of view has matured into a more nuanced suite of beliefs that range from the radical *metaphysical naturalism* of absolute materialism, to a less dogmatic *methodological naturalism* that values the objective scientific method first proposed by Bacon, but avoids its metaphysical implications. The form of naturalism that I refer to here is the attitude of my own experience in the universities. It is not sophisticated or philosophically based. It is simply a negative principle, reflexively applied in all cases of implied spirituality, and as such is more an ideology than a philosophy. Because it is not philosophically based, and is essentially reflexive in nature, it is very powerful, and very difficult to penetrate with reasoned argument.

A rationale

First some basic New Church theology: We are told in Chapter 21 of John's *Revelation* that there are twelve gates into the New Jerusalem. The number twelve in the internal, spiritual sense signifies "all things of faith,"¹⁰⁹ faith signifies the implantation of truth,¹¹⁰ and this, we are told, is the beginning of the work of God.¹¹¹

Swedenborg interprets "the twelve gates" to mean that there is a gate to suit the particular needs of every person who is seeking spiritual truth, each gate serving as some unique manifestation of "all the knowledges of truth and good."¹¹² Since "twelve" signifies "all things of faith" we can assume that the number of gates equals not a literal twelve, but the number of people needing to enter there. That's an infinite number, spiritually speaking, and that is no doubt a good thing.

One of these gates—the one we are looking at here—is the natural truths of science. Swedenborg used that gate. From a grounding in natural philosophy, Emanuel Swedenborg was drawn through that gate into the deeper truths of the spiritual causes of natural things. He explained this process to German theosophist Friedrich Oetinger, who was fascinated with Swedenborg's philosophy of heaven and earth. In the last passage of *Soul- Body Interaction* (1769), Swedenborg explains

This happened in the same way that fishermen were made disciples and apostles by the Lord . . . I too was a spiritual fisherman from my youth. When my companion heard this, he asked what a spiritual fisherman was. I answered that in the Word, a fisherman in the spiritual meaning indicated a person who hunts out and teaches natural truths.¹¹³

There is a lesson in this. Science today is confirmed in the limiting worldview of Naturalism, which cannot provide a purpose for existence. This is causing a crisis of identity and purpose for many people and even

109. Swedenborg, *Arcana Coelestia*, § 2089.

110. Swedenborg, *The Apocalypse Explained*, § 813.

111. *Ibid.*, § 226.

112. Swedenborg, *The Apocalypse Revealed*, § 916.

113. Swedenborg, Emanuel, *Soul-Body Interaction*, § 20, in *Miscellaneous Theological Works of Emanuel Swedenborg*, Swedenborg Foundation, New York, 1988. (Formerly entitled *Intercourse of the Soul and Body*) Read this entire passage in Appendix H.

nations of the earth. There is chaos at hand, and I suggest that the rise of scientific materialism is largely to blame.¹¹⁴ Life without purpose spawns existential nihilism just as Naturalism leads to what Swedenborg calls “the negative principle,” that eventually denies all things, submits to no authority, and ends up as a kind of insanity.¹¹⁵ From this come two great challenges: 1) The “traditional” Western religions—Christianity (from fundamentalist to liberal) and Judaism in its various expressions—do not possess the theology sufficient to answer and support the recent surge of interest in spirituality by scientists who are asking penetrating questions that the “religious establishment” cannot answer. 2) Scientists think and ask questions in the language of science, and even sublime New Church theology cannot answer them in kind. This is something that theologians fail to understand. The specialized language of religion is not the language of science.

These are problems of our time, but they are not new at all. Swedenborg responded to this same dilemma in his time by presenting a system based on scientific, not theological principles, but principles in which spirit is prime mover, nonetheless, and nature is not from nature but from spiritual substance (thus having a purpose and origin beyond itself).¹¹⁶ The objectivity and language of science were inherent in this system. He showed the scientists of his day a rational approach to the question of spiritual causes for natural

114. This claim is based on a simple rationale. Swedenborg believed that naturalism resulted from the dissociation of the spiritual-natural contiguum, and the subsequent erroneous assumption that all things of nature are from nature. This is not a harmless illusion. Once people are unharnessed from absolute truths originating in God, they are free to substitute relative truths of their own. (This is the archetypal image of the fall into evil found in *Genesis*, Chapter 1, where we find Adam and Eve attempting “to be as gods themselves...”.) A spiritual-natural worldview was commonplace from the ancient world through the middle ages. It was the skepticism of the Enlightenment that brought about this dissociation, first in the intellectual tradition of philosophers and scholars, but eventually making its way into to the culture at large. Nature was cut loose from purpose, and God was no longer necessary for happiness. It can be argued that the degree of unrest in the Western world is a consequence of an absence of spiritual authority, and that this absence can be traced back to the removal of final cause from the accepted method of finding truth, that is, science and subsequent scientism, in the modern era. “Forever O Lord, your word is settled in heaven” (*Psalms* 118:89) is no longer the case, and we are left as spiritual orphans, to fend for ourselves.

115. Swedenborg, Emanuel, *Apocalypse Explained*, § 575, *True Christian Religion*, § 13:4, *Arcana Coelestia*, § 2588:2.

116. Swedenborg’s scientific works deal with chemistry, physics, anatomy, physiology and psychology, but from a clearly theistic base. His research proceeds according to a scientific method, but one that includes and in fact requires *final cause* in his explanations of natural order.

things. I suggest that this same approach is effective for the scientists and philosophers of this day as well—more effective, perhaps, because the science of the new millennium has finally pushed itself to limits that only purpose can explain.

Naturalism cannot explain the purpose of natural things. Scientific materialists cannot raise the question of final cause, because as we have seen, purpose, by definition, lies outside of what modern science does. Worse still, traditional Judeo-Christian dogma simply does not address this question in a pragmatic way.¹¹⁷ And although Swedenborg's theological writings address this question in an intellectually defensible manner,¹¹¹⁸⁸ they explain it in a language apart from the language of science, making it essentially inaccessible to scientists.

Biblical models of accommodation

In *Exodus* and *The Acts of the Apostles* we find a spiritual model to help us understand this predicament. It is all about language, perception, and accommodation. In *Exodus* we find Moses doing a very un-Mosaic thing. He is trying to get out of his assignment, from Jehovah Himself, to go back to Egypt and help the children of Israel out of their misery. *Exodus* 4:10-16:

- 10 Moses said to the Lord, "O Lord, I have never been eloquent, neither in the past nor since you have spoken to your servant. I am slow of speech and tongue."
- 11 The Lord said to him, "Who gave man his mouth? Who makes him deaf or mute? Who gives him sight or makes him blind? Is it not I, the Lord?"

117. One might ask how this might be so, considering the constellation of science-religion books written in the last two decades, by an array of such authorities as Arthur Peacocke, Keith Ward, Francis Collins and others. Although these authors comment on the relationship of science with religion in its various manifestations, it is the "standard model" of Judeo-Christian theology that is in question here. Aside from the literal narrative of *Genesis* 1, this tradition bothers little with questions of causation, cosmogony, biological and human origins, the origin of matter, spiritual-natural interaction or other practical problems of the human intellectual experience. This theology is concerned with generals, and ill-defined salvation is assigned to causation as a common end. Although Swedenborg's theological writings do enter into such questions as these, they are in theological, and not scientific, language.

118. *Nunc liceat intellectualiter intrare in arcana fidei.* ("Now it is permitted to enter with the understanding into the mysteries of faith.") Swedenborg, *True Christian Religion*, § 508:3.

- 12 Now go; I will help you speak and will teach you what to say.”
- 13 But Moses said, “O Lord, please send someone else to do it.”
- 14 Then the Lord’s anger burned against Moses and he said, “What about your brother, Aaron the Levite? I know he can speak well. He is already on his way to meet you, and his heart will be glad when he sees you.
- 15 You shall speak to him and put words in his mouth; I will help both of you speak and will teach you what to do.
- 16 He will speak to the people for you, and it will be as if he were your mouth and as if you were God to him.¹¹⁹

Next, in the *Acts of the Apostles*, we find the Apostle Paul spreading the Good News in Athens, the intellectual capital of the ancient world—the Harvard, Oxford, or UCLA of the ancient world. Entering the Areopagus, he challenged the smartest Epicurean and Stoic philosophers there: “All the Athenians and the foreigners,” it says, “who lived there [and] spent their time doing nothing but talking about and listening to the latest ideas.” Just like a top tier university. How did Paul do in that arena? *Acts* 17:22-34:

- 22 Paul then stood up in the meeting of the Areopagus and said: “Men of Athens! I see that in every way you are very religious.
- 23 For as I walked around and looked carefully at your objects of worship, I even found an altar with this inscription: TO AN UNKNOWN GOD. Now what you worship as something unknown I am going to proclaim to you.
- 24 The God who made the world and everything in it is the Lord of heaven and earth and does not live in temples built by hands.
- 25 And he is not served by human hands, as if he needed anything, because he himself gives all men life and breath and everything else.
- 26 From one man he made every nation of men, that they should inhabit the whole earth; and he determined the times set for them and the exact places where they should live.

119. What we have here is a failure to communicate. Moses, being “slow of speech and tongue,” is afraid that the Hebrews will neither listen to nor comprehend what he will say to them. Noting that Moses’s brother Aaron “speaks well,” the Lord arranges a work-around to solve this dilemma. He will speak to Moses, Moses will speak to Aaron, and Aaron will speak to the Hebrews. God’s will shall be communicated in a language that the people will understand.

- 27 God did this so that men would seek him and perhaps reach out for him and find him, though he is not far from each one of us.
- 28 For in him we live and move and have our being. As some of your own poets have said, 'We are his offspring.'
- 29 Therefore since we are God's offspring, we should not think that the divine being is like gold or silver or stone—an image made by man's design and skill.
- 30 In the past God overlooked such ignorance, but now he commands all people everywhere to repent.
- 31 For he has set a day when he will judge the world with justice by the man he has appointed. He has given proof of this to all men by raising him from the dead."
- 32 When they heard about the resurrection of the dead, some of them sneered, but others said, "We want to hear you again on this subject."
- 33 At that, Paul left the Council.
- 34 A few men became followers of Paul and believed. Among them was Dionysius, a member of the Areopagus, also a woman named Damaris, and a number of others.

Paul didn't accomplish a mass conversion of the Athenians to Christianity, but neither did he fail. He had the courage to engage his intellectual opponents that day. They were the best; and he held his own against them. How? He got them to listen because he talked to these philosophers in their own language. And he got a few to see the light. How many? "Dionysius, Damaris, and a number of others." We will return to these stories.

There are two foundations of truth. Why not use both?

How can science be a gate into the New Jerusalem? Swedenborg himself had learned the hard way, that one cannot climb *up* the ladder of Being from the natural world to the world of spiritual causes; one must instead descend, from the top down. But as he told Professor Oetinger, with science and religion, the lower state precedes the higher.¹²⁰ Swedenborg the

120. A recurrent theme in Swedenborg's treatment of the Scriptural narrative is what is "first in time" against what is "first in end"; and that the first in end is that to which all

scientist did not fail in some way, only to be rescued by the Lord for some higher purpose. His call to be a revelator came as he found himself in his prime, but with no place to go from there. It was his science that took him to that jumping-off-place. So jump off he did, leaving his science books behind. I suggest that he didn't do all that work for nothing, and after studying his science books, I am convinced that he left them for us in our time, for tools to end the culture wars. Note well that the word here is *tools*, not weapons. It is time to get to work; we have had enough of war. Why do I believe this to be the case? Swedenborg tells us that there are "two foundations of truth,"

. . . one from the Word, the other from nature or from the truths of nature. The foundation from the Word is for the universal heaven, thus for those who are in the light of heaven; but the foundation from nature, is for those who are natural and in natural light But, still, [these two foundations of truth] agree the one with the other. Since the sciences have shut up the understanding, therefore, the sciences may also open it; and it is opened so far as people are in good. . . . all things of heaven constantly have their foundation in the laws of the order of nature, in the world and in man, so that the foundation remains permanently fixed.¹²¹

And he also reminds us, from experience, that

The Tree of Knowledge [leads] to the Tree of Life. Science is the key to natural things whereby things heavenly are opened up.¹²²

What at first seems paradoxical, is really just how things work out in practice. *Spiritual Experiences* 5709 states that there are two sources for truth, spiritual and natural. The one is from revelation, intuition, induction,

things look. A lower spiritual state, as represented by the appearance of truth and good in the church, or faith and charity in life, or even the birth order of Esau and Jacob, serves as the foundation for the higher state. As such, the lower state must by necessity appear first on the scene, or "first in time." See *Arcana Coelestia* § 3325, *Apocalypse Revealed* § 17, *True Christian Religion* §§ 336, 406 for discussions of this principle.

121. Swedenborg, Emanuel, *Spiritual Experiences*, (1745–1765), General Church of the New Jerusalem, Bryn Athyn, Pennsylvania, 1998, § 5709.

122. Swedenborg, Emanuel, *The Messiah About to Come*, (1745), Academy of the New Church, Bryn Athyn, Pennsylvania, 1949, X (1749).

rational process, etc., and the other is from sensory experience. Spiritual truth is superior to natural truth, but because we are natural beings, we begin where we are, with what we have, and work our way to spiritual inspiration. As *The Messiah About to Come*, X tells us, natural truth (science) leads us to spiritual truth.

Swedenborg reminds us of the causal relationship of spirit to nature, and of nature's purpose as anchor, for the spiritual world in ultimates. What better way to bring natural people—scientists included—into the New Jerusalem than by the gate of their own natural philosophy?

Swedenborg's scientific corpus has been largely disregarded by the learned world over the past 250 years. But in providence, it lies ready to use on a new crop of skeptical scientists who might believe in spiritual reality, if they were only shown a reasonable and plausible way to go about it. There are two foundations of truth; but Swedenborg is clear that although the natural precedes the spiritual, it can in fact serve as the only foundation, for those who are not "in good." This does not mean scientists who practice evil, but rather those who deny the possibility of spiritual cause, even if it were to help explain things. The ideal is to welcome both foundations as complementary means to the truths of nature. Swedenborg's theistic science is a marvelous gate into the New Jerusalem, neglected over time, but ready now to manifest its purpose.

An emergent solution to a very modern problem

To define the crisis of modern science and religious faith, we must first understand its origins in Western Medieval scholarship. Then we will lay out a description of science as it exists at this moment in history. For a very long time, the business of knowing was a proposition of facts subservient to faith. Science, even Aristotle's science, was constructive so long as it squared with its interpretation by the church. Without the systematic scholarly methodology that we take for granted today, there was little academic power to challenge the faith system of a thousand years of doctrinal accumulation. So science, or knowledge based on the systematic, objective development of facts based on facts, was delimited by the parameters of faith.

But then, one small contribution at a time, religious authority began to feel the pressure of a new objectivity in scholarship, demonstrated by early

Renaissance Humanists. Erasmus, for example, in all seeming innocence, pointed out some painfully obvious errors in his textual analysis of the Holy Scriptures; and with Lorenzo Valla's debunking of the *Donation of Constantine*¹²³ as a forgery, people began to look at objective methodology as a powerful scholarly tool for finding the truth in the things they read. With Francis Bacon's *Novum Organum*, the same thing would now apply to things of the senses as well. As this new scholarship, manifested in both literature and science, came to challenge the authority of tradition, a tension grew up between the two that would last into the present day. But as Enlightenment science has come of age, and slowly expanded to finally supplant religious faith as the new authority, a curious juxtaposition is taking place. Now it is scientists, not churchmen who are beginning to find themselves on the defensive.

When President Bush plunged into the debate over the teaching of evolution this month [August, 2005], saying, "both sides ought to be properly taught," he seemed to be reading from the playbook of the Discovery Institute, the conservative think tank that is at the helm of this newly volatile frontier in the nation's culture wars.

Mainstream scientists reject the notion that any controversy over evolution even exists. But Mr. Bush embraced the institute's talking points by suggesting that alternative theories and criticism should be included in biology curriculums "so people can understand what the debate is about." Financed by some of the same Christian conservatives who helped Mr. Bush win the White House, the organization's intellectual core is a scattered group of scholars who for nearly a decade have explored the unorthodox explanation of life's origins known as Intelligent Design. Together, they have mounted a politically savvy challenge to evolution as the bedrock of modern biology, propelling a fringe academic movement onto the front pages and putting Darwin's defenders firmly on the defensive.¹²⁴

123. In 1439 Italian humanist Lorenzo Valla published *Discourse on the Forgery of the Alleged Donation of Constantine*, a philological analysis of a purported decree by Constantine I in A.D. 315, giving political authority over the Western Roman Empire to the Holy See. His analysis clearly showed the document to be a papal forgery, and produced a flurry of attention to the power of Humanist scholarship. Harrison, J. L., *On the Discourse on the Forgery of the Alleged Donation of Constantine*, retrieved from www.UMBC.edu on 06/19/14.

124. Wilgoren, Jodi, "Politicized Scholars Put Evolution on the Defensive," *New York Times*, August 21, 2005, <http://www.nytimes.com/2005/08/21/national/21evolve>.

After four centuries of “progress,” scientists are falling victim to their own limitations. Science as a means to truth, like so many other institutions in these early days of the New Jerusalem, is in a state of radical change, with new findings requiring new ways of knowing. Here is how things stand: Naturalism, described by Swedenborg in the eighteenth century, is still gaining momentum. But because of its built-in denial of purpose for the things of nature—Aristotle’s *final cause*—scientists cannot pursue the epistemological and teleological questions now being raised within certain scientific disciplines themselves. Problems of knowing and being, of complexity and design and diversity, are beginning to plague the disciplines of quantum physics and cosmology, evolution, and molecular biology in the twenty-first century. There are questions emerging that demand attention to the metaphysical considerations of “why” as well as “what” and “how.” The leading edge of science begs for explanations that the traditional rules of science do not allow.

Scientists, who must be objective above all other things, are dealing with some unsettling phenomena. The Heisenberg Uncertainty Principle¹²⁵ and Bell’s Theorem¹²⁶ of “spooky-action-at-a-distance,” challenge what objectivity really is. Force carriers¹²⁷ come and go, in and out of “reality,” as matter at its lowest (or is it highest?) level redefines objectivity. And Richard Dawkins’ dogmatism notwithstanding, certain levels of complexity in biological forms

html?oref=logins&_r.

125. Werner Heisenberg found that the act of observation has an effect on the activity of quantum particles, thereby making objective knowledge of their behavior difficult if not impossible to document with certainty. “One cannot assign exact simultaneous values to the position and momentum of a physical system.” The Uncertainty Principle, *Stanford Encyclopedia of Philosophy*. Retrieved January 10, 2013 from <http://plato.stanford.edu/entries/qt-uncertainty/>.

126. John Stewart Bell discovered that subatomic particles connected through quantum entanglement appear to communicate information faster than the speed of light. In fact they may do so simultaneously, regardless of distance. The Uncertainty Principle, October 8, 2001, revised July 3, 2006, *Stanford Encyclopedia of Philosophy*. Retrieved January 10, 2013 from <http://plato.stanford.edu/entries/bell-theorem/>.

127. “In quantum field theory, vibrations in the field that correspond to a force give rise to particles called force carriers. Particles that interact via a particular force do so by exchanging these force carrier particles.” These particles are without mass and appear to come in and out of existence with the vibration of energetic fields, to aid in their propagation. Where they come from and where they go is at present unknown. Their behavior has led some quantum physicists to speculate on the existence of another “world” beyond the observable one of our experience. Force Carrier, Annenberg Learner. Retrieved on January 10, 2013, from http://www.learner.org/courses/physics/glossary/definition.html?invariant=force_carrier.

strain the limits of the Neo-Darwinian Synthesis to explain.¹²⁸ Worse yet, since the emergence of “Creation Science” as an ideological movement in the mid-twentieth century, the issue of divine agency in nature has become increasingly polarized and politically charged. The “Culture Wars” are going strong, and scientists who only a few years ago might have been neutral on issues of spirituality are now understandably reactive to anything religious in tone.

And yet, despite the reactive environment that prevails, there is new and genuine interest in the interface of spirituality and science. Inspired in part by the John Templeton Foundation over a period of several years, the inclusion of spiritual possibilities alongside physical laws is no longer a startling development in our culture. “Science and religion” is no longer an oxymoron, and finding the two together in conversation has become an ordinary thing. But the boundaries between this new culture and the sometimes hostile agenda of the religious right are lost on scientists who see only danger when religion enters in. Reactivity becomes backlash, and a new spirit of active atheism is on the rise, energized by anger and indignation. The Culture Wars are heating up. The “dialogue” is in danger of collapse.

A new intelligentsia is arising, no longer just opponents of religion, but are calling for the end of religion altogether, not as a failed intellectual program, but as a menace to the human race, and an impediment to human understanding. Theirs is an impressive voice. A chronological list of major players includes J. L. Mackie (*The Miracle of Theism*, 1981), Francis Crick (*The Astonishing Hypothesis*, 1994), Daniel Dennett (*Breaking the Spell*, 2005), Sam Harris (*The End of Faith*, 2005), Richard Dawkins (*The God Delusion*, 2006) and Christopher Hitchens (*God is Not Great*, 2009). These books grow more acrimonious over time. Reasoned scientific and philosophical arguments

128. There are many natural phenomena that seem to point to the necessity of supernatural agency in their design, and until the modern era, this belief was essentially universal. With the appearance of Enlightenment radical skepticism, however, this belief was challenged, and then refuted altogether, ultimately finding its best expression in the evolutionary doctrine of Darwinism, and later the Neo-Darwinian synthesis. But there has been a recent resurgence of the design concept appearing in the work of various scientists who offer an argument for what they formally call Intelligent Design. Their work is based on two axioms, 1) that certain identifiable natural systems are too complex, and their component parts too interdependent, to have resulted from natural selection (“irreducible complexity”), and 2) that the evolution of these systems exceeds chance in both their combined complexity and specificity (“specified complexity”). Examples given for such systems include the vertebrate eye, the flagellar motor present in organisms and cells across the phyla, and the many interdependent factors present in the blood clotting cascade.

are giving way to emotional outbursts by scholars who have been maligned by Christianity's militant wing, and who now are looking for revenge. They are organizing on a university campus near you: There are web sites and foundations springing up to encourage people to throw off the ancient yoke of religion and join the "brights" in the building of a new and harmonious (but rather one-dimensional) world.¹²⁹

Why this level of anti-religious energy from scientists and philosophers? First, we really do have the fundamentalist influence to thank for some of it; it is hard to see Christian charity at work in some of the tactics they employ. But that is not really it at all. It is the New Jerusalem, coming down out of heaven, from God, one mind at a time, that has the scientific world in such a state. And it is the vastation¹³⁰ of the Christian Church, finally unraveling after two thousand years. The old way isn't working any more. Fear of loss is manifested not as fear, but as anger. And anger, a powerful emotion, shuts off the higher levels of the mind.

One thing more. The mainstream religions cannot offer skeptical scientists or philosophers satisfactory answers to questions of ultimate reality in their own terms, were they inclined to seek them out. To them, the religion they see at work in the world is an ideological straw man, easily demolished by their well-framed questions—questions that Judeo-Christian theologians cannot answer, except by articles of faith. Fundamental problems of emergence of matter and form, pantheistic connection, entropy (randomness), even the nature of life, are not addressed by the Abrahamic faiths, except in the most general way. It is not the fault of their theologians; traditional religious doctrine just does not extend into such practical matters as these.

129. See the Appendix, pp. 375–379, to Richard Dawkins' *God Delusion* entitled "A partial list of friendly addresses, for individuals needing support in escaping from religion." Dawkins has moved from polemicist to evangelist here, with this impressive listing of anti-religion organizations. There is also a recruitment-oriented brights web site at <http://www.the-brights.net>.

130. *Vastation* is a Latinate term unique to Swedenborg's writings, generally meaning a final state of collapse. In this case it applies to the end of a church (which itself means a spiritual era and not simply an organization), as described by Swedenborg in this manner: "The condition of a church is in general this, that in process of time it recedes from true faith and finally ends in no faith. When there is no faith it is said to be vastated." (*Arcana Coelestia*, § 407) He observed the vastation of the Christian Church as the causative event for the Last Judgment in 1757.

In the last part of Chapter 4, “Why there almost certainly is no God,” in Richard Dawkins’ *God Delusion*,¹³¹ we find an excellent example of this troubled state of affairs. There is a fundamental problem here, as Dawkins describes his experience at a Templeton Foundation conference at Cambridge on Science and Religion, a gathering at which he says he was the “token atheist amongst the eighteen invited speakers.” There he challenged the participants to respond to his point that “a God capable of designing a universe, or anything else, would have to be complex and statistically improbable.”¹³² Describing the response, he says,

The theologians were *defining* themselves into an epistemological Safe Zone where rational argument could not reach them because they had *declared by fiat* that it could not . . . There are other ways of knowing besides the scientific, and one of these must be deployed to know God. The most important of these turned out to be the personal, subjective experience of God. (p. 154)

It is easy to feel his annoyance at the exclusivity of these ground rules. And it is easy to identify with his frustration at this apparent manipulation of the process.

Dawkins says that he was eventually attacked by name-calling (“nineteenth century”), which he assumed was in retaliation for his asking, “Do you believe in miracles,” “Do you believe Jesus was born of a virgin?” and “Do you believe in the resurrection?” But these questions were perfectly appropriate. He broke through the customary barrier of politeness and asked Christian theologians if they believed the core doctrines of their own religion. According to Dawkins, “it embarrassed them because their rational minds knew it was absurd, so they would rather not be asked.” He says he left the conference “stimulated and invigorated,” but from a close reading of this narrative, I believe that he left with his feelings hurt. And his animosity towards religion was not likely diminished by the experience.

Despite his editorializing, Dawkins is right on all counts. Traditional theology (which is all that these traditional theologians had at their disposal)

131. Dawkins, Richard, *The God Delusion*, Houghton Mifflin Company, Boston, 2006, p. 151.

132. This argument against the existence of God, showcased in *The God Delusion*, is Dawkins’ best effort, which turns out to be a restatement of the canonical “infinite regress” argument in different terminology.

could not respond *in kind* to his perfectly appropriate challenge (the infinite regress argument), and these traditional theologians could not answer his direct challenges to the tenets of their faith. They stone-walled him; they retreated into the 'safe-zone' of 'subjective experience.' In doing so, they made him the winner of the encounter. And they lost his respect.

So what is the answer to this predicament, with the theologians circling the wagons, and the advantage to Dawkins and company, with confidence in their own human ingenuity growing by the day? The obvious answer might be deep, wide, New Church theology to provide people with a rational basis for spiritual belief. But as counter-intuitive as it may seem, that might be wrong. Scientists do not normally engage in theology, so they do it rather poorly when they try. Dawkins's efforts are evidence enough of this. They are scientists, not theologians; they lack the training, the experience, and the specialized vocabulary for doing deep theology. Scientists are no more conversant with these specialized things than theologians with the language of genetics, or molecular biology. So why expect it of them?

The misunderstanding comes at the level of expectations . . . ours and theirs. They ask scientific questions. They expect scientific answers. This is to say they are looking for answers in their own language, because that is what they expect and understand. And what is wrong with that? Dawkins likes to taunt his religious enemies by saying (incorrectly for that matter) that the existence of God is a *scientific* question. If someone—anyone!—were to answer him in his own terms, I believe that he would at least stop and listen.

An enlightenment era solution for a very modern problem

Swedenborg confronted this same challenge from the beginning of his career, so he set out to give scientists and philosophers scientific and philosophical answers to their objective challenges to faith. He did this very well in the scientific works that he wrote before his call to become a theologian. These works are rich with meticulous description and reasoned speculation. They are rigorous in method and the terminology is precise. They are everything that scientific works should be. Here we find good science applied from the axiom that the human body is a dynamic spiritual-natural unit, animated by a soul, and created for a purpose. But there is no magic in these works, only rational arguments from experience, that model

an effective method that we can learn to use: a two-step process of taking experimental or descriptive data and subjecting them to his *induction*, or moving them collectively from unconnected specifics to general systems, and then subjecting this new generalization to further analytic scrutiny. By this method he accomplished his major goal, which was to construct an intellectually defensible model for spiritual-natural interaction in creation and in the human body, in the language of science, to leave behind for generations to come. And then the Lord moved him to a different place, where he could continue to work out the same great problems, but from the top down, and this time in the language of spirit.

*When Israel was a child, I loved him, and out of Egypt I called my son.*¹³³

In the Scriptures, Egypt signifies natural truths. At some point a person is able to move up from their foundation of natural truths into the universalizing knowledge of spiritual reality. But we must start out in Egypt. Isn't Egypt the right place for natural people to begin?

Scientists and philosophers want science and philosophy that makes sense, and Swedenborg's scientific and philosophical works offer concepts they will understand. There in those "scientific works" lie the core theological doctrines of the New Jerusalem: spiritual influx, series and degrees, forms, and correspondence. Here is *formative substance*, flowing in from the spiritual world bringing human form to matter; and here is the soul's descent into the body, bringing life to even its smallest parts. Here is a spiritual-natural paradigm—not in the language of theology, but in the language that scientists would recognize and understand, and possibly engage. It's all there, in familiar terms, to fit their states, and to meet their expectations. It is a wide and visible gate into the New Jerusalem.

Not everyone will want to jump through that door. But some will, and many will see how it is at least possible to enter with the understanding into the mysteries of faith. And that is worth a lot. Is this work easy? No. Sometimes a theistic scientist will be apprehensive that they won't know the right things to say, or that people will reject their ideas. But then we recall those powerful stories about Moses and the Apostle Paul.

133. *Hosea 11:1 Holy Bible (New King James Version).*

Tikkun

The Lord told Moses not to worry about what to tell the people of Egypt. He said, “I will help you speak and will teach you what to say.” But for whatever reason in the literal sense, the Lord saw that His truth would require a “stepping down,” *through* Moses, *to* Aaron, who could accommodate it to the perceptive requirements of those people at that time—the same message, but on a different level, and in the language of its receivers.

This is a powerful spiritual model for bringing peace to the culture wars of our day. Scientists speak their own language and see things according to their own cognitive structures. The language of theology is foreign to them, and kindles resentment in some; many scientists have experienced irrational religious systems, and are not receptive to ideas couched in religious terms at all. But if divine truth were to come to them in the language of science and philosophy, and if it were able to bring rational answers to their penetrating questions, then Aaron will have spoken, from the inspiration of Moses, whose wisdom was from the Lord Himself.

But won't people reject religion out of hand? Some surely will; that is what freedom is all about. But look at what happened to Paul in Athens. “A few men became followers of Paul and believed,” it says, “among them Dionysius, a member of the Areopagus, also a woman named Damaris, and a number of others.” That is a start, and it will win more “converts” than continuation of the negative principle by both sides. It is communication instead of disputation, in the affirmative spirit of humility. If nothing else, it could bring a new level of civility to the conflict.

Look at what happened to Swedenborg himself, who never set out to be a revelator or a theologian, but who chose to devote his time and energy to natural philosophy. Natural truths eventually became his doorway—his personal gate—into the next level: from philosopher to theologian, from scientist to spiritual fisherman. In the section that follows, we will see Swedenborg at the work of uncovering these natural truths, and observe how from each new discovery emerged the necessity to master yet another great principle to make his system work. Doctrine¹³⁴ followed doctrine in

134. In the terminology of Swedenborg's day a “doctrine” represented what would today be called a “hypothesis,” or working model. For a greater system comprised of a related grouping of such doctrines, the term “theory” would apply. No such terminology existed in the scientific culture of the eighteenth century.

a great succession of necessity. His goal of finding and explaining spirit's interaction with nature was achieved by ascending a series of doctrinal steps, each of which seemed at first a stumbling block, but which would later serve to bring him closer to his destination.

We have seen how young Swedenborg the scientist was driven to explain the operation of spirit in nature. We have had a look at the historical context which produced such ambition. Working in the early decades of the Enlightenment, his optimism was unbounded. Bacon's new scientific method must have seemed a highway to his success, for the power of this method must have seemed unlimited. This is what we sense as we read his early works.

But we find frustration there as well. The scientific paradigm that he brings to bear against this problem of problems—*by what comprehensive and comprehensible mechanism do spirit and nature interact*—did not mature as easily as hindsight makes it seem. Through a series of conceptual advances he was able to find his way. What follows is a detailed narrative of how these advances came into being, but with attention to how each was *drawn* into being from the necessity of previous discoveries. Each new doctrine was a solution to the problems posed by the one before. It is important to trace this development, because each of Swedenborg's powerful doctrines is a hybrid of natural and spiritual principles, but explained in the precise, objective language of science. And it is these same doctrines that we will use in the final section, to address a problem central to twenty-first century science that has become equally elusive to theistic and naturalistic scientists alike. The more we know about these doctrines the better we will put them to use.

Swedenborg's science—his natural philosophy—has been neglected long enough. It is a method that will prove to be effective in addressing the questions that scientists ask, and in answering their reasonable demands that claims to spiritual causes for natural things be made in the language of logic and experience. It has only to be picked up and put to use, for the thoroughly modern scientific tools it offers.

INTELLIGENT DEFAULT: CHAPTER THREE EZEKIEL'S WHEELS: NECESSITY AS METHOD

AN AFFIRMATIVE PRINCIPLE

From what has come before, we can now begin to develop a pragmatic rationale for how the Infinite makes its way into the finite, and how these two levels of order are functionally related. Using both scientific and theological principles from the works of Emanuel Swedenborg as well as other sources, the goal is to construct a model for spiritual/natural interaction that attempts to approximate its actual nature in terms of the spiritual “laws” by which it operates.¹ Once this model has been constructed, it can be put to use in solving a very modern problem in theistic science, that of the emergence of natural forms.

Emanuel Swedenborg, philosopher, scientist, and theologian, was an ambitious man, born in 1688, on the cusp of the modern era, but operating from a context of classical “natural philosophy.” For him, there was nothing that he could not explore with the powerful lens of science. His earliest works foretell the direction of all his studies to come, and despite the diversity of titles and even claims of spiritual vision, his mission is always clear: explaining how spirit flows into nature, the “action-at-a-distance” when nature responds, and the nexus, that place where the two worlds meet. He discusses much more than this along the way, but despite the range of topics we may encounter in his works, we can see these ideas basic to the spiritual-natural paradigm, driving him forward at all times. He spent his efforts to

1. A spiritual, or two-world tradition has existed throughout history, likely having arisen with human consciousness. Swedenborg describes the first humans as physically primitive but spiritually sophisticated, and the earliest known human cultures had some form of spirituality at their core. Always there was a dualism of worlds, of their inhabitants, and their attributes. Although this tradition does nothing to prove the premise in scientific terms, it shows the spiritual-natural dualism as integral to the human experience from our beginnings. The Greeks, most notably Plato (who was following in the tradition of Pythagoras and the pre-Socratics) and the Persians with their innovative Zoroastrian dualism of good and evil gods formalized this enduring idea, which has been variously manifested in human culture as opposing sets of God and Satan, darkness and light, upper and lower worlds, or an evil *Sitra Achra* (“Other Side”).

lay the groundwork and produce the base for a conceptual model of how these things work, as manifested in the natural phenomena around us. His perennial question was not so much “why?” or even “what?” but “how.”

Such a model is vitally important: If we aspire to seriously consider the possibility of spiritual causes for natural things, we must first have some understanding of how such a system might work. If natural things do have spiritual causes, then without a framework of spiritual principles on which to arrange the factual data of science (observable, reproducible natural phenomena), we cannot expect to be able to “see” the relationship of the one to the other. Once such a framework of spiritual principles is in place, seemingly unrelated scientific “facts” begin to reflect the order of their spiritual causes, originating in the Creator, descending into nature as Order itself. We soon begin to see this order in the apparent chaos of the natural world. *As above, so below*. This concept is as old as the human mind, but it still yearns for a mechanism.²

But seeing and believing are sometimes two different things. The world of science is the world of the senses—observations from stimuli flowing in from below the rational mind. Spiritual reality is the opposite of this, flowing in as it does from above. At the confluence of these two inputs the messages are ordered, decoded, and stored for future use. Which source is more reliable? From which reality do all things spring? It all depends on the frame of reference.

Natural reality relies on the limited modalities of its own world: temperature, touch, pressure, sound, and vibration. It cannot aspire to more. Spiritual reality by definition relies on modalities that do not respond to natural limits and cannot be measured by them. So what are we to do? Must we embrace the one at the expense of denying the other? Is there some way to embrace both realities while remaining true to the requirements of both? Are we doomed to live our lives in one or the other extremes of thought? The young scientist Emanuel Swedenborg asked himself this question and

2. *As above, so below*. This is another primordial concept, related by extension to the spiritual/natural dualism mentioned above. This theological refinement identifies the lower, natural world as a *microcosm*, or model, of the *macrocosm*, or higher spiritual world. These worlds are not separate but linked by some interactive mechanism. Rooted in Christian theology by the “on earth as it is in heaven,” clause of the Lord’s Prayer, this idea continues to be pervasive. What has been lacking is a rational explanation of the interactive mechanism; it is this that Swedenborg addresses with his doctrines of *discrete degrees, forms and correspondence*.

set out to answer it, first by boldly approaching spiritual reality with the methodology of the natural. His progress through this uncharted territory is fascinating to track, as his focus sharpens with each failure and each problem solved. What principle guided his progress? The same principle can guide us still, as we bring our ever more powerful science to bear on the enduring conviction that nature is not all, and that Spirit is the “realist” reality of all. Long after his early disappointments and the crisis of his middle years, Swedenborg explained this guiding principle that allows us to apply the rational mind to understanding spiritual reality. It is not compartmentalization that allows this, or picking and choosing among the data at hand. It is a simple attitude of mind that he called the *affirmative principle*:

There are therefore two basic attitudes of mind, the first leading to folly and insanity, the second to intelligence and wisdom. The first occurs when someone denies everything, that is, says in his heart that he is unable to believe those things until he is convinced by things which he can grasp in his mind and perceive with his senses. This is an attitude that must be termed the negative principle. The second occurs when someone regards affirmatively the things which comprise doctrine drawn from the Word, that is, when he thinks within himself and believes that those things are true because the Lord has spoken them. This is an attitude that leads to perfect intelligence and wisdom, and must be termed the affirmative principle.³

This powerful attitude is nothing more than a willingness to believe that there are things that we cannot perceive with our senses, and an open mind to allow the rational faculty to operate without prejudice in the worlds of its experience. What might this look like on the ground? The affirmative principle means entertaining the possibility that the mind is not just the sum of the chemical activities of the brain, but is something greater than this sum, and transcendent of the material platform on which it rests. The affirmative principle means considering the possibility that life is not inherent to living things, but in fact flows into them, as finely-tuned receiving vessels of living spiritual substance. The affirmative principle means objectively considering the premise that natural things of this world are linked—draw their actual

3. Swedenborg, Emanuel, *Arcana Coelestia*, Swedenborg Society, London, 1985, § 2568:4.

existence from—things in a parallel spiritual world. What the affirmative principle does not mean, however, is blind acceptance of unsupported claims. It is the willingness to look at things in an entirely different way, where things are possible until they are proven otherwise.

This is harder to do than Swedenborg, the brash young scientist, first assumed it to be. But it is not impossible. The freedom inherent in this principle agrees with the necessity of scientific objectivity while allowing the mind's eye to see beyond the limits of the senses.

RATIONALE: ACTION-AT-A-DISTANCE

The problem is not whether spirit comes into nature or nature is on her own. Both paradigms are based on belief, not experience, and are matters of choice. The problem, if one adheres to the spiritual model, is how spirit comes into nature.

4 Then I looked, and behold, a whirlwind was coming out of the north, a great cloud with raging fire engulfing itself; and brightness was all around it and radiating out of its midst like the color of amber, out of the midst of the fire. 5 Also from within it came the likeness of four living creatures. And this was their appearance: they had the likeness of a man. 6 Each one had four faces, and each one had four wings. 7 Their legs were straight, and the soles of their feet were like the soles of calves' feet. They sparkled like the color of burnished bronze. 8 The hands of a man were under their wings on their four sides; and each of the four had faces and wings. 9 Their wings touched one another. The creatures did not turn when they went, but each one went straight forward.

10 As for the likeness of their faces, each had the face of a man; each of the four had the face of a lion on the right side, each of the four had the face of an ox on the left side, and each of the four had the face of an eagle. 11 Thus were their faces. Their wings stretched upward; two wings of each one touched one another, and two covered their bodies. 12 And each one went straight forward; they went wherever the spirit wanted to go, and they did not turn when they went.

13 As for the likeness of the living creatures, their appearance was like burning coals of fire, like the appearance of torches going back and forth among

the living creatures. The fire was bright, and out of the fire went lightning. 14 And the living creatures ran back and forth, in appearance like a flash of lightning.

15 Now as I looked at the living creatures, behold, a wheel was on the earth beside each living creature with its four faces. 16 The appearance of the wheels and their workings was like the color of beryl, and all four had the same likeness. The appearance of their workings was, as it were, a wheel in the middle of a wheel. 17 When they moved, they went toward any one of four directions; they did not turn aside when they went. 18 As for their rims, they were so high they were awesome; and their rims were full of eyes, all around the four of them. 19 When the living creatures went, the wheels went beside them; and when the living creatures were lifted up from the earth, the wheels were lifted up. 20 Wherever the spirit wanted to go, they went, because there the spirit went; and the wheels were lifted together with them, for the spirit of the living creatures was in the wheels. 21 When those went, these went; when those stood, these stood; and when those were lifted up from the earth, the wheels were lifted up together with them, for the spirit of the living creatures was in the wheels.⁴

From this vivid image springs the oldest of Jewish mystical disciplines, *Merkabah* (“chariot”) mysticism, an oral tradition of Geonic, or post-Talmudic Palestine. Developed over a period of a thousand years, from the first to tenth centuries C. E., contemplation on Ezekiel’s vision and its inner meaning produced an enduring tradition of Jewish gnosis—first-hand knowledge of the worlds within worlds that must be traversed for the soul to return to its origin in the Divine.⁵

Here was knowledge of sorts, of the structure of the heavens, and their connection with the earth, the “ladder” one might climb from this world to the next. Coupled with the mechanism of God’s creative emanations into nature—the *sefirot* of *Sefer Yetzirah* (Book of Creation) and *Zohar* (Book of Splendor) that followed—an enduring esoteric tradition was established that would explain spiritual-natural connection in the cryptic terms of mystical experience.⁶ In the commentary on these images we find a primal science

4. *Ezekiel* 1:4–21 *Holy Bible* (New King James Version).

5. For a comprehensive treatment of this foundational doctrine of Jewish mysticism, see Sholem, Gershom, *Kabbalah*, Dorset Press, New York, 1987, pp. 11–22.

6. The inability of language to describe ineffable visions is a perennial limitation of mystical literature. But another reason for obscurity is the common practice of writing for

of the nature of God's immanence. Even in its other-worldly images and language, the mystical message of the throne and the *sefirot* describes the Creator's descent into nature, in an elaborate system of accommodation. The archetypal image of Ezekiel's "wheels" and their relationship to the "creatures" suggests an ineffable link of spiritual cause to natural effect.

But as understandable as it might be for the mystic to proclaim spiritual-natural reality in such vivid imagery, what is the pragmatist to do with such visions? How do the *Merkabah*, or divine *sefirot* explain the coming-into-being of matter, the nexus of the soul with its body, or the operation of the mind with its brain? How does it explain the life in living things? If the "spirit of the creatures" is indeed "in the wheels," (and there are scientists and pragmatic thinkers of this modern era who sincerely believe that it is), then it is time that someone told us *how* it is in them—not in esoteric terms and images, but in the rational language of science.

Is this a realistic expectation? Yes, if mysticism, science, and even language can each be persuaded to yield a bit to the unity of the whole. This is the synthesis at which Emanuel Swedenborg labored throughout his life—the translation of the ineffable into pragmatic and usable terms. In his pursuit of this goal he left us the components of a model, incomplete at the end of his remarkable career, and incomplete still—but all the stronger now for the centuries of science that have intervened to get us to the present.

The problem is not whether spirit enters into nature to interact with it in some way. This paradigm, just as its naturalistic antithesis, is based on axiom and is thus by definition a matter of belief, not proof.⁷ The problem, for a person in the ranks of the spiritual-natural axiom, is not *if*, but *how*. This question moves us from comfortable (even blind) belief to healthy skepticism, and then to objective model-building for explanation.

Two classical obstacles have plagued this model, and predictably enough, they have to do with connection. As splendid as the inspiration of the

the adept in a code of sorts, while thereby obscuring true meaning from the uninitiated, who might misuse this knowledge for base purposes.

7. Traced back to their bare origins, even the most powerful of paradigms may rest precariously on an unprovable assertion (opinion, in essence), and not "hard truth" at all. "An axiom, also known as a presupposition, is an assumption in a logical branch or argument from which premises can be fed and implications derived. Some axioms, called presuppositions, are actually just premises in disguise, which are typically implicitly stated as an axiom." *Axiom*, RationalWiki. Retrieved on February 2, 2012 from <http://rationalwiki.org/wiki/Axiom>. An unsettling thought for ideologues.

Kabbalists may have been, theirs was a connected universe, where God flows into nature and by necessity is one with it.⁸ Theirs is a pantheistic world where God is nature. And by logical extension, this allows that we, even as natural beings, must somehow be extensions of God ourselves—not a healthy situation, according to *Genesis* 3: Concerning the fruit of “tree in the midst of the garden,” Eve told the serpent,

“You shall not eat it, nor shall you touch it, or you will surely die.” And the serpent said to the woman, “You will not surely die. For God knows that in the day you eat of it your eyes will be opened, and you will be like God, knowing good and evil.”⁹

Once they have eaten, God sees His children in a very different light:

“Behold,” says Elohim, “the man has become like one of Us, to know good and evil.”¹⁰

To be as gods themselves This oldest of fantasies was never a productive attitude in the Biblical narrative. Time and again it led to destruction. And yet it has such seductive intellectual appeal. From the *sefirot* to scientism¹¹ it thrives in the humanistic religion of our day, that reassures us we “will not surely die.” Swedenborg understood that we are not gods ourselves; we are not direct extensions of the Creator. The “Divine spark” may indeed reside in us, but it is not us. But if we are not gods, he wondered, how then are we connected?

8. A perennial sticking point in spiritual-natural cosmology is the problem of connection. There seems at first to be only two distinct possibilities to define the relationship between Creator and Creation: a) Since God is creator of the universe, then the universe must subsist as an extension of God (*Pantheism*), or b) once established as an independent, self-sustaining system, God no longer interacts directly with Creation (*Deism*). For Swedenborg there was the necessity for a created world that was distinct enough from God to allow for spiritual freedom, but interactive enough to allow for a mechanism of divine providence at work in the world.

9. *Genesis* 3:3–5, *Holy Bible* (New King James Version).

10. *Genesis* 3:22, *Holy Bible* (New King James Version).

11. Since the 17th century, scientists have avoided the problem of spirituality by embracing only the sensory world as the source of data valid for its uses. By agreeing in advance to this methodological hemianopsia, a materialistic paradigm has emerged, where the only reality is natural, and the only causes are material, formal and instrumental—the basis for a quasi-religion in its own right. This was the emerging “naturalism” of the Age of Reason, against which Swedenborg labored.

The other option, for those who desire a God but who cannot tolerate pantheistic imminence, is to sever the tie of Creation altogether. Once created and established, the universe is set free from its meddlesome continuity. This is a workable strategy, but again, the question of connection is not solved, or even addressed. It is eliminated, in a Deistic universe where, by default, the human is the measure of all things.¹² In a world deserted by its maker, there is nothing left except “to be as gods ourselves.” Here are two very different paths, but with a single destination: Throughout the history of ideas, philosophy has labored under this false dichotomy of choices.

19 When the living creatures went, the wheels went beside them; and when the living creature were lifted up from the earth, the wheels were lifted up. 20 Wherever the spirit wanted to go, they went, because there the spirit went; and the wheels were lifted together with them, for the spirit of the living creatures was in the wheels.¹³

This vivid image represents “action at a distance,” the central unsolved problem in cosmology: effort in one location producing an invisible yet unmistakable response in another. Despite their inability to bring this mystical image into practical focus (and in some cases they came very close),¹⁴ the Kabbalists could live with a system in which free will and connection somehow went hand in hand.¹⁵ The Deists of the Age of Reason imagined a world where being severed from the Creator still somehow

12. It is not difficult to see how, in a culture that has become inured to the limited vision of scientism, Deism could easily lead to a radical humanism that could in turn embrace a paradigm of frank atheism.

13. *Ezekiel 1:19–20, Holy Bible (New King James Version).*

14. Isaac Newton, the “last sorcerer,” was an alchemist and thoroughgoing Kabbalist, who owed his discovery of the laws of gravity to his devotion to this mystical concept. He was careful to explain that his was a discovery of how gravity behaved, not how it worked, according to a mechanism he believed to be the unknown and mystical “hand of God” at work. See White, Michael, *Isaac Newton: The Last Sorcerer*, Fourth Estate, Great Britain, 1997.

15. Try as they might, the Kabbalists were beset by a conundrum beyond the philosophical limits of their experiential method. Their *sefirot* did not emanate from God, but in fact were God, coming down to earth in steps, affording no separation between the last step (*Malkhut*) and the world of human experience. If people were free, their freedom was of a limited sort that presented its own philosophical difficulties. We must remember that the Jewish mystics were mystics first—reporters and interpreters of spiritual experience—and philosophers only after that.

left an avenue of connection.¹⁶ But neither could support these ambitions with satisfactory philosophy; they could wish it, but they couldn't think it. And there we have rested for 300 years. As any philosopher of his day, Swedenborg was aware of this unacceptable paradox. In his striving to define the connection he uncovered a third and very plausible explanation for action-at-a-distance. If we are neither gods nor orphans, he wondered, from *On Tremulations* (1719) to the *True Christian Religion* (1771), how then are we connected? This was the big question, and from his earliest efforts he set out to answer it.

The "spirit of the creatures" for Swedenborg was as real as the creatures themselves, but it resided in another world, on another level of reality. It was made of other substance, and interacted with the matter of this world in a functional relationship he called *correspondence*.¹⁷ The one is a vessel for the other, containing it but not continuous with it.¹⁸ And the form of the vessel answers the requirements of its spiritual counterpart—its cause—to the best of its ability. What results is not a relationship of continuity, and certainly not detachment, but a cosmic dance of partners, one responding to the intention of the other, moving in a "reciprocal union,"¹⁹ the two united by mutual affinity.

16. This avenue was by means of a general providence: God's "plan" as embedded in the world at Creation, and manifested according to the natural laws governing the behavior of matter and energy. There was no divine intervention in this system once it was up and running, and yet Age of Reason intellectuals were fond of appealing to it as if it were: "We, therefore, the Representatives of the United States of America, in General Congress, Assembled, appealing to the Supreme Judge of the world for the rectitude of our intentions . . . And for the support of this Declaration, with a firm reliance on the protection of Divine Providence, we mutually pledge to each other our Lives, our Fortunes and our sacred Honor." Thomas Jefferson, *The Declaration of Independence*, July 4, 1776. We find here and elsewhere in Deistic statements a specious assumption of a rather muddy concept of action-at-a-distance.

17. Correspondence for Swedenborg denoted the causal relationship between related things on different levels of reality, and yet interactive by means of the *structure* of one answering the necessity of the *function* of the other. See Appendix C for a proper treatment of this central element to Swedenborg's entire scientific and theological program.

18. Swedenborg used the Neo-Latin term *impletio*, in English translation "impletion," in a rather technical way, to carefully define this essential concept that would steer him past the false dichotomy of continuity vs. detachment. In a previously published essay, I explained this concept, writing, "The soul is of spiritual substance, and resides in the body in the 'inmost,' a portal that allows the Divine to flow into the natural receiving vessel as a complete entity, residing in, but not combining with this vessel." (See TCR 697:7, CL 220:2, 315:8.) (Bell, Reuben P., "Brides of Christ," *New Church Life*, 2002.)

19. This is a term used by Swedenborg to denote the causal relationship of spirit to nature, soul to body, which describes the functional link between two separate but related entities. See TCR 99, *Inv.* 48, *DLW* 35.

This is what Swedenborg devoted his life to discovering and explaining. It was not easy work. Each discovery produced new necessities requiring further discovery to complete the system. Soon it became clear that to fully elucidate the mechanism of spiritual-natural interaction would require the derivation of several new methods, each specialized for its own share of the work. The nature of these new doctrines was clear enough, but achieving them would prove to be the challenge, as the enormity of the distance between the two worlds became more and more obvious to this ambitious man. Recognizing the magnitude of this challenge in the Prologue to *The Soul's Domain* (1742), Swedenborg explains that

. . . since it is impossible to climb or leap from the organic, physical, and material world—I mean, the body—immediately to the soul, of which neither matter, nor any of the adjuncts of matter are predicable (for spirit is above the comprehensible modes of nature, and in that region where the significations of physical things perish); hence it was necessary to lay down new ways by which I might be led to her, and thus gain access to her palace—in other words, to discover, disengage, and bring forth, by the most intense application and study, certain new doctrines for my guidance, which are (as my plan shows) the doctrines of forms, of order and degrees, of series and society, of communication and influx, of correspondence and representation, and of modification; these it is my intention to present in a single volume, under the title of *An Introduction to Rational Psychology*.²⁰

This audacious goal of achieving all these methods in a single volume soon collided with the reality of the task, and the *Introduction* never came. The doctrines would yield much more slowly than he predicted, to the measured accumulation of scientific method and spiritual experience.

Although there is no comprehensive system neatly bound in a single volume, Swedenborg has left us nonetheless with a plausible model of this system—not complete and neatly done, but in its component parts, scattered from one end of his writings to the other. The intervening urgency of his “call to revelation” would change his course and change his mission to some degree, but in the end it was all the same: explaining the connection.

20. Swedenborg, Emanuel, *The Animal Kingdom* (now *The Soul's Domain*), Swedenborg Scientific Association, Bryn Athyn, Pennsylvania, 1960, § 17.

The parts are there. What is left to us is assembly, in the light of the sublime science we possess today. The great spiritual principles (the “doctrines”) required to construct a powerful model—of how spirit comes into nature and interacts with it without *being* nature—are at our disposal. Some are simple. Some are not. But if each can be persuaded to yield a bit to the unity of the whole, what emerges is a world as mystical as any spiritual vision could ever offer, but as comprehensible as any rational mind might require.

WHY BOTHER?

Does it matter that we should know the mechanism for the interaction of spiritual and natural? How could this philosophical problem possibly affect the lives of ordinary people, or interest anyone beyond a small circle of theologians? The answer lies in the very human arena of hope—hope for meaning to what ordinary people do every day.

I enjoy teaching biology. It is a discipline with a rich history and an exciting state-of-the-art that promises an almost limitless future. Things are happening in biology. There are plenty of good textbooks to choose from, and although they may differ in this way or that, they all agree on one thing: there is no spiritual perspective in any of them. This is not surprising. Biology is a science after all, and in that guise, has nothing at all to say concerning purpose, or final cause. Besides, biology seems to be doing quite well on its own, without any need for a spiritual foundation. It makes sense, it answers questions, and it is successful in its own way. So why wouldn't a biology professor be content just to teach what is in those textbooks, written by experts in the field?

The problem, as I see it, is one of mistaken identity. Francis Crick, Richard Dawkins, William Provine, Stephen Jay Gould²¹ and a lot of other

21. In *Leonardo's Mountain of Clams and the Diet of Worms* (1998), Gould qualifies this dichotomy with the introduction of NOMA, or the “non-overlapping magisteria” of science and religion into the debate. Gould explains that although these magisteria, or paradigms, may both be valid domains, the one cannot be critiqued from within the other. This idea has been strongly challenged by Dawkins and other atheistic biologists, but nonetheless does nothing to mitigate the problem of the exclusive dichotomy described above. NOMA or not, Gould would no doubt join the others in forcing this choice. As we shall see, this is a false dichotomy.

prominent biologists regularly tell people, in the tacit but powerful language of authority, that we must make a choice if we are going to study biology. Option One: the natural world, with all its living things, is a self-regulating series of random events which arose of itself by some poorly understood process long ago, and has been organizing itself ever since. Period. It is all just an “accident.” As rational and sophisticated as human beings may be, we are a fluke of the universe. That’s the modern view. Option Two, called Creation Science, or Special Creationism, is an apologetic philosophy that labors to prove the account of the earth’s creation as set forth in the literal narrative of *Genesis*, Chapter 1.

Take your pick: One is called Scientific Materialism (the *naturalism* of Swedenborg’s day), and the other is not good science. This is the choice that is offered to anyone who wishes to learn about life and the processes inherent to it. But beware an offer of only two choices: It is likely a false dichotomy, a forced choice between only two possibilities, one obviously correct, and another that seems weak, or even soft-headed. A false dichotomy is a deceit, cleverly designed to coerce opinion and exclude other points of view. People from across the political and religious landscape mistakenly believe that biology must be identified with one or the other of these philosophical extremes. And extremes they are. One excludes all possibility of a spiritual component to natural things. The other, from an inverted philosophical agenda, sets out to prove experience by hypothesis. Neither side is willing to budge 2.54 cm., and the science-religion interface is frozen, like some ancient and stable fault-line that no longer generates movement or interest. There is activity—polemical broadsides and name-calling and preaching to the choir from both sides—but not much interest in discussion of the constructive kind; not much empathy; not much charity. *Illa quae audivi relinquo; retineo apud me quae protuli* seems to be the order of the day.²²

22. We have a long way to go, to get to a state of mutual receptivity. Krister Stendahl observed that “No interfaith conversation is genuinely ecumenical unless the quality of mutual sharing and receptivity is such that each party makes him or herself vulnerable to conversion to the other’s truth,” and we certainly don’t see that happening among these people. Swedenborg reports a conversation between two spirits in the world of spirits, who were disputing the possibility of free will. One, a good spirit, was open to the ideas of the other, while his companion was completely closed minded on the matter. “*Illa quae audivi relinquo; retineo apud me quae protul*,” said the evil spirit—“I reject what I have just heard, and keep in my mind what I suggested myself.” (TCR 504:4) In the language of the opponents of our day, “I do not have an open mind, and I don’t intend to change it.” Not much progress since 1772.

To be fair, the scientists cannot be faulted for their contrary stance. For them this issue is simple: “Creation Science” isn’t good science. It tends to be circular and weak, and labors to prove a theological point by the application of carefully selected facts. Contradictory data are ignored, or explained away in complicated hypothetical ways. It does not seem to be objective. And, very importantly, these same scientists have not seen a metaphysical system that could serve the requirements of their “good science,” the things that they know from experience to be true: things like the great distances between the stars, not just in space, but time—far more than the Creationists allow, for light to make its way across the universe (16,000,000,000 years, against the 7,500 year limit of their theology);²³ things like the apparent relatedness of organisms in a phylogenetic scheme that begs for a mechanism of evolution for explanation;²⁴ things like the apparent great age of the earth—6 billion years—again, too long for the literal Biblical narrative to allow. What else can science and its practitioners offer but dichotomy? This, to them, is exactly what it seems to be.

So what is science, anyhow? And why is it so wonderful? As simple as it may be, science is another victim of mistaken identity. People believe science to be a thing, when it is really something that we do. Science is a method—the “scientific method” applied to problem solving. It is simple. It begins with an observation that, from human curiosity, generates the question, “Why?” or “How?” or “What?” Next comes an explanation, from reason, that is plausible enough to satisfy a rational mind, for one who would go no further.²⁵ But for a scientist, the next step is a test to check the accuracy of the hypothesis—to hold it up against experience. This is of course experiment, the trademark of science, the very name itself suggesting the necessity of experience. From this we may form conclusions about our educated guess. But even if correct, we are not done, because out

23. To address this reality, some creation scientists have allowed for the creation of these great distances with light already streaking between two points, so that the mathematics will work out. For a collection of similar approaches to this problem, see <https://answersingenesis.org>. In an earlier era, this same kind of reasoning would lead astronomers to attach epicycles to the circular orbits of planets, again to preserve an ideology of perfection at the expense of objectivity.

24. Again, an explanation insisting that all these forms—even transitional ones—were created as-is, in a static arrangement of *apparent* phylogeny.

25. Backed by the powerful new tool of deductive philosophy, this hypothesis as it is called, was enough for the Greeks, who loved philosophy. But it is not enough for those who demand that the explanation square with experience.

of experiments come new questions as well as answers—new observations that lead to new hypotheses, on and on forever. The party-line of science says this method drives a continuous upward-trending spiral of the ever-increasing perfection of knowledge. The same party-line insists that this method is as blindly objective as Lady Justice herself.²⁶

In the early 1980s every physician in the world knew that peptic ulcer disease was caused by either stress or erosive elements of the diet, or both. This was doctrine. But Barry J. Marshall, an Australian gastroenterologist with a lot of experience with this disease, reported an observed correlation between duodenal ulcers and the presence of certain “harmless” normal flora bacteria in the upper gastrointestinal tract of his patients. In 1983 he reported this to his local medical society to no effect. Then he began to report these findings at international symposia, but again to no effect. Soon he found himself a pariah at medical meetings, preaching his heretical notion of an infectious etiology. At one point he was barred from presenting his annoying ideas altogether. But after 10 years a few doctors began to “see” the same correlation with the same bacteria, and eventually *Helicobacter pylori* were being taught as “possible” agents of ulceration. Today this well-known fact is medical doctrine, taught to students as if it had always been the case.²⁷

Old ideas die hard. In the *Helicobacter* story experience prevailed over dogma, even if ten years intervened. But how often does this not happen? How would we know? The ideal of the upward spiral of perfection that for many defines science, is a dubious ideal at best. Science may be powerful, but it is not perfect, and it surely does not progress as majestically toward truth as we blithely suppose. Quantum physicist Max Planck once observed that “a new scientific truth does not triumph by convincing its opponents

26. Since Thomas Kuhn’s *Paradigms of Scientific Revolution* (1962), we have known what we always suspected to be the case with scientific progress. Old ideas are replaced by new ones only when the pressure on the status quo becomes so great that, like the mounting pressure along a sub-surface fault line, there is a cataclysmic rupture of the old, along with the irruption of the new equilibrium. This is far from the idealistic notion of gradual perfection, and it points up the problematic nature of the “objectivity” assumed to drive the process.

27. “Press Release, 3 October 2005, “The Nobel Assembly at Karolinska Institutet has today decided to award The Nobel Prize in Physiology or Medicine for 2005 jointly to Barry J. Marshall and J. Robin Warren for their discovery of the bacterium *Helicobacter pylori* and its role in gastritis and peptic ulcer disease. Summary: This year’s Nobel Laureates in Physiology or Medicine made the remarkable and unexpected discovery that inflammation in the stomach (gastritis) as well as ulceration of the stomach or duodenum (peptic ulcer disease) is the result of an infection of the stomach caused by the bacterium *Helicobacter pylori*.” There is so much *story* missing from this terse, almost clinical announcement.

and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it.”²⁸ This has been shortened over time, to “physics progresses one funeral at a time,” an apocryphal affirmation of Kuhn’s observation. He was right, in a way. Objective as the scientific method may be, it is practiced by humans, who can be quite irrational at times. Pure reason has human limitations. And yet, the scientific method is a powerful engine for getting at natural truths. But is it the only way?

Contrary to the false dichotomy offered to us almost 400 years ago,²⁹ I suggest that there is a metaphysical system whose principles in general do no violence to what in general we call science. Specifics here and there may not agree, but this in itself is no cause for alarm. Discrepancies arise from the imperfections inherent in both. Imperfections in science, perhaps, but in religion? Yes: Limitations of our human ability to fully use and understand either one. The systems may be perfect in form, but never in operation.

This is important. If there is such a system, why don’t the major players in the science of biology know about it? Simply stated, it is new, and old ideas die hard. This system, based on Emanuel Swedenborg’s life-long search for the nexus and mechanism of spiritual-natural interaction, has a lot to teach about the natural world. Most basically it teaches that every natural thing has a spiritual cause; everything in our universe exists because something in the spiritual universe behind it (prior to it, Swedenborg would say) is related to it by the linear relationship of End → Cause → Effect.³⁰ A

28. Max Planck, German physicist (1858–1947) and Nobel Prize laureate in physics in 1918, in *Scientific Autobiography and Other Papers*, trans. F. Gaynor (New York, 1949), pp. 33–34.

29. “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.” —Francis Bacon, *Novum Organum* (1620). Some say this statement constitutes the birth of naturalism.

30. As might be expected, Swedenborg has much to say about the nature of a triune Godhead. But he begins his discussion with the proper philosophical foundation, linking this spiritual relationship with the relationship among all things of creation: “It is known that in order for anything to be complete, there must be a trine in just order, one under another, with communication between each part, and that this trine constitutes a unity.” (Appendix to *True Christianity* § 17). “In every Divine work there is a first, a middle, and a last (or ultimate); and the first passes through the middle to the last (or ultimate), and so comes into manifest being and subsists. And as the ultimate is the container and the basis, it is also the support. In every complete thing there is a trine, which is called first, middle, and ultimate; also end, cause, and effect. When these things are comprehended, it is understood that every Divine work is complete and perfect in its ultimate; and likewise that the whole is in the ultimate, which is a trine, because the prior things are together, or simultaneously, in it.” (*Doctrine of the Sacred Scripture* § 27–28)

spiritual cause provides both existence and subsistence for a natural effect.³¹ And behind both of these is the end, or purpose. The natural world is an extension (in a carefully defined way) of the spiritual, and until a person can “see” this, biology (or any of the natural sciences) will make no sense in its essentials. If these don’t make sense, then all those other things of science are just unconnected details, to be memorized and stored, but not fully understood. What freshman biology major has not felt just this way?

Plato described the limitation of not being able to see the causes of things in his *Theaetetus*:

There are uninitiated persons who believe that nothing exists except what they have grasped with their hands; but efficiencies of action and the generations and origins of things, in fine, whatever does not come under the eyes, this least of all, do they believe to be in the class of things that exist.³²

Swedenborg studied Plato, and was well aware of the same problem. He said the same thing this way:

They who reason and draw conclusions from the fallacies of the senses attribute all things to nature, and scarcely anything to the Divine; if they attribute creation to the Divine, they imagine, nevertheless, that all things were transferred into nature, and that all the effects that appear flow from nature alone, and nothing from the spiritual world; as when they see the wonderful things that pertain to silk-worms, butterflies, bees, the wonderful things in the generation of all animals from eggs, and innumerable other like things, they imagine nature to be the sole artificer of these things, and are unable to think at all about the

31. And this effect, far from being the static thing that it may appear to be, is constantly coming into being. This idea is just now beginning to dawn on particle physicists, who are at home in a world of things coming in and out of existence. “The learned know that remaining in being consists in perpetual coming into being. Nevertheless it is contrary to their affection for falsity, and consequently to their reputation for being learned, to say that natural forces are constantly kept in being, even as they came into being, from the Lord’s Divine. Now because every single thing remains in being from the Divine, that is, is constantly coming into being from Him, and every single thing from that source is inevitably a representative of the real thing by means of which it has come into being, the whole visible universe is therefore nothing else than a theatre that is representative of the Lord’s kingdom. And this in turn is a theatre representative of the Lord Himself.” (*Arcana Coelestia*, § 3483:2)

32. Plato, *Theaetetus*, 154e, from Burnyeat, Myles, Levett, M. J., Ed., *The Theaetetus of Plato*, Hackett, Indianapolis, 1990, paragraph 193.

spiritual world and its influx into the natural, and about the existence and subsistence of such wonderful things as being from that source; and yet the truth is that the Divine flows in continually through the spiritual world into the natural, and produces such things, and that nature was created to serve for the clothing of these things that proceed and flow in from the spiritual world.³³

Naturalism, the belief that all things of nature arise from nature, was a major ideological persuasion gaining momentum in the Age of Reason. It still is, now under the banner of scientific materialism. But times have changed; nothing stays the same. It is accelerating today at a breath-taking pace. Consider one example, the Human Genome Project.

Under budget and ahead of schedule, the HGP, a national network of molecular biologists and their laboratories, quickly completed its work: defining the human organism by mapping every one of its 25,000 or so structural genes, the biochemical units that, in proper sequence, make us human, and not some other living thing. There was no malice in this project; this was no satanic work. Already we are reaping collateral benefits in gene therapy and genetic screening capabilities. But the young, energetic scientists who do this work are just that: young and energetic. They don't think too much about the direction their work is taking the human race. Similar research continues apace: cloning is no longer a hypothetical ethical proposition; a viable human poliovirus has been built from scratch. These wunderkind of the universities are too close to the ground, traveling too fast, too distant from the experience of long life, and too excited about what they are doing to consider the consequences.

The consequences are dire: You are a fluke of the universe. Everything you are—physical, emotional, social, even the experience of transcendence—is an effect, not of some ill-defined spiritual “cause,” but of chemical reactions at work. You are the effect of your own personalized collection of tiny biochemical units that make up the genome your parents gave you. Spiritual causes for the natural effects? “Show me the spirit behind the DNA. Tell me how it works, and show me how I need it to live.” So far no religious system has been able to respond effectively to these very valid demands. Why bother to look for spiritual causes for the things we see clearly in

33. Swedenborg, Emanuel, *The Apocalypse Explained*, Swedenborg Foundation, New York, 1976, § 575:5.

the natural world? Because there is a good chance that they are there, and because they allow us to see connections among the phenomena of the natural sciences that we might never see otherwise—causes of causes of causes. And doing so might improve the way we do science. Any system that allows for spiritual causes would also allow science to continue on, unmolested, but in tandem with a spiritual system that makes sense. Such a system would not exclude science. It would welcome it as a partner in the search for truth. Both would be the stronger for it.

Theistic science was of course central to Swedenborg's methodology, but we find an appreciation of it in other mystically inclined philosophers of science as well. To those for whom spiritual reality is fundamental, the scientific method can be a welcome partner. In the writings of Rabbi Abraham Isaac Kook for example, we find a similar affirmative attitude towards scientific knowledge working with mystical experience to search out the truths of nature:

There is no contradiction whatsoever between the *Torah* and any of the world's scientific knowledge. We do not have to accept theories as certainties, no matter how widely accepted, for they are like blossoms that wither. Very soon, scientific knowledge will be further developed and all of today's new theories will be derided and scorned But the word of God will endure forever.³⁴

Finally, and from a practical point of view, learning lists of unrelated facts is tedious and difficult, and these kinds of details do not stay in our heads for long. The ones that do cannot be easily retrieved, because too often they are not related in a meaningful way. Ask a medical student about the transition from the classroom, where memorization and regurgitation serve quite well, to clinics, where experience, critical thinking, and application of data are essential. There is a world of difference. How knowledge is ordered dictates how meaningful it will be in practice.

34. Abraham Isaac Kook (1865–1935), Jewish thinker, Halachist, Kabbalist and renowned Torah scholar, took a particular interest in the relationship of science to mystical and rabbinical Judaism. In his *Orot HaKodesh* we find very modern views on the compatibility of the mystical and empirical paths to knowledge—views that run parallel to Swedenborg's theistic philosophy of science. It is tempting to speculate that mystics might be more receptive to the natural truths of science than naturalists to transcendent knowledge. To a mystic, science might more easily be seen as one important means to knowledge as a whole, and not excluded as a competing paradigm.

Is it hard to see spiritual causes? No, but it too is a method, an attitude and a habit. It too requires practice. To be done correctly, several things must be overcome: 1) the temptation to see only the natural in the natural; 2) the thin skins of those who cannot stand criticism, because there will be criticism with this method. Old ideas die hard, and nobody is being polite these days; creationists and naturalists alike often drop all pretense of manners and go at one another with little charity; 3) the underdog mentality that implies that outside the world of the senses we cannot really be sure about what we say; 4) an apologetic attitude about ideas from any age that deal with the reality of both spiritual and natural worlds. Remember, the “hardest” science is likely based at its core on axioms, assumptions of belief. If there are absolutes (and a few people still believe that there are) they are not provable by measurements or equations alone.

Now is the time for science and religion to join forces in a complementary way, to investigate the operations of nature as never before. It will take a lot of work. It will take open minds. It may take a funeral or two. But the result will be worth the effort. This partnership is long overdue.

Why bother? Because there are some powerful ideas that scientists of the new century need very badly, if they are to overcome the myopia of the senses alone and forestall the dehumanization that reason alone brings. The fat is in the fire. Naturalism looms large on the horizon. At stake may be our connection, not just to the spirit that moves within us, but to the promise of purpose inherent in it.

THE NECESSITY FOR A PRAGMATIC MODEL

It is advisable to begin any conceptual journey with model-building, however simplistic may be our beginnings, and proceed from there to perfect the model as we go along. If we wait for the details to fall into line, we will never begin.

There is a world of experience between model and theory. Both are derived the same. Both are in the middle of the thing that science does. Observation leads to question and question to answer, an explanation to put the curiosity to rest. As long as the answer remains untested it is called hypothesis, an “educated guess,” of sorts, that asks “What if”? What if

this or that were done, to force the hypothesis to reveal itself true or false? When this or that is finally done, and the question resolved, then a datum has entered the realm of natural revelation. A fact is born.

As these facts accumulate they sometimes reveal more than the sum of their parts could ever do. Data sets take shape to reveal knowledge of compound things that are sometimes beyond clear vision of their complex natures. Data sets reveal the whole long before we see it, by providing us with outlines, as connect-the-dots pictures do.

If this new reality is based on many and reliable data, and experiments continue to perfect the outline, then at some point this collection in itself becomes theory. Subject to revision and perfection as new data continue to emerge, theory is powerful in its ability to both explain what we cannot see, and predict what we cannot imagine.

Gravity is such a data set. Countless tests and measurements, repeated and confirmed since Galileo's day, have reliably determined the attractive force between bodies separated in space. The theory that addresses this force can even predict its magnitude if the masses of the bodies are known.³⁵ But theory it remains, because the energetic wave that physicists agree makes gravity has not yet been detected. But it is there . . . or so they believe.³⁶ Do the missing pieces keep us from calculating gravitational attraction, or keep us from using gravity to sling space probes beyond our planetary system? No. Such is the power of theory. The data that combine to produce it cannot do these things alone, but in concert they can give us an image of reality that "fills in" the missing parts. The image, despite its speculative nature, has the power of reality within it.

35. We find a case in point, even with something as sacrosanct as gravity: The gravitational constant (G) is not constant at all, and has now been found to vary over time. This only reinforces the tentative nature of our best theories. Mikhail L. Gershteyn, Lev I. Gershteyn, Arkady Gershteyn and Oleg V. Karagioz, "Experimental Evidence That the Gravitational Constant Varies with Orientation," *Gravitation & Cosmology*, Vol. 8 (2002), No. 3 (31), pp. 243–246, ©2002 Russian Gravitational Society.

36. "One of the remaining tests of general relativity is to measure gravitational waves directly. To this end, experimental physicists have built the Laser Interferometer Gravitational-Wave Observatory (LIGO) at Hanford, Washington, and Livingston, Louisiana. Each experiment consists of laser beams that are reflected between mirrors placed up to 4 kilometres apart. If a gravitational wave passes through, it will slightly distort space-time, leading to a shift in the laser beams. By monitoring time variations in the laser beams, it is possible to search for the effects of gravitational waves. No one has yet detected a gravitational wave directly . . ." Ferreiro, Pedro, *General Relativity: "Gravity Waves," New Scientist*, Vol. 2767, 30 June, 2010.

But what if there were other systems, as big and important as gravity, but for which there were fewer data and much less experience? How long do the data lie uncollected until someone comes along to gather them into a coherent set and begin to put them to use? Do we wait until there is the predictive power of theory in them to go ahead, until all doubt is distilled away by further experimentation? What if we wanted to use the system, before it was a full-fledged theory? We can. But to avoid confusion we might call this less than perfect set a model.

This is the signature of another powerful scientific construct, a hypothetical system whose strength lies in its imperfection. This is theory in the making—“what if” at its finest. Models allow us to bring data together to see if something greater than their sum will possibly emerge from the way that we arrange them. In the process, our knowledge of the system continues to build and grow until we can begin to see some lines between the dots, and a little flesh on the bones of our objective. And all the while, we are free to sculpt our model as we please, with a “maybe” here and a “possibility” there, to uncover new dots of understanding.

According to physicist and philosopher of science Ian Barbour, there are essentially four kinds of models in science, experimental, logical, mathematical, and theoretical. In Chapter Three of *Myths, Models and Paradigms*,³⁷ he not only explains these, but carefully defines the place and use of models in the scientific method.

Let me summarize the main themes of this chapter. First, models have a variety of uses in science. They serve diverse functions, some practical and some theoretical. Second, theoretical models are novel mental constructions. They originate in a combination of analogy to the familiar and creative imagination in inventing the new. They are open-ended, extensible, and suggestive of new hypotheses. Third, such models are taken seriously but not literally. They are neither pictures of reality nor useful fictions; they are partial and inadequate ways of imagining what is not observable.

A model is no straw man, constructed just to be struck down. Models bring problems into focus and they move us from general to particular knowledge; they give us the confidence to see connections. They are not

37. Barbour, Ian G., *Myths, Models and Paradigms*, HarperCollins, New York, 1974.

gospel, but they are at least a pale image of it, that will serve until experience turns model into theory.

What follows is a conceptual journey. What is to keep it from quickly becoming a labyrinth of idle speculation? A model. Because of the creative power of models, this conceptual journey will be a model-building expedition, that will take what we do know about spiritual substance, and natural matter, and the relationship between them, and connect these dots to the best of our ability. It will require an open mind, because there are not that many dots where we are going. It will require that we suspend the prejudice of theory along the way (because our science is never as objective as we imagine it to be), recalling that even theories must be open to review. It will require that we wait to judge ideas until they have found their place within the model. And if they do not find a place, then out they go. This journey will require the reader to become a participant in the process, to follow the track where the data lead, and to judge them by their harmony with the model in which they rest. This is a journey not of dogma but of discovery. We must start before we are really ready, but if we wait for the details to fall into line, we will never begin. We will take with us what we have, and start from where we are. And however simplistic may be our beginnings, we will proceed from there to perfect the model as we go along, with all the eyes that can be brought to bear on the subjects at hand.

IDEOLOGICAL PERSPECTIVE: YOUR THREE EYES

We see only what we are conditioned to see, by preconceived notions of philosophy, theology, and even physiology. Each of these disciplines is an eye, with a unique but limited perception of its own. But when used together, they form a holographic image of the whole.

People have three eyes: three ways of looking at anything they choose to examine. The “eyes” are different systems of thought, and each one sees from a slightly different angle. Physiology teaches us that only when both of our eyes are used together can one see a thing in complete perspective. Imagine the holographic enhancement of the visual image that three eyes might produce. We need to look at the evolutionary history of each of these

eyes, their individual natures, and what each one is and is not, in order to find out what each one is for, and how to use them correctly. Each of these eyes can see the truth. But to see it most clearly requires equal measures of theology, philosophy and science.³⁸

The evolution of these three is easy enough to imagine. Theology will require more speculation to describe than will science, for which the history is known. But for our purposes it is enough to state that each one of these systems of thought did evolve, and was not summarily invented, as an addendum to the human experience. Indeed it was experience that necessitated the evolution of all, for just as in biology, necessity is the mother of form, and even calls things into being.

Theology (or religion, as theology at work may be termed) must certainly have come first, emerging as it does fully formed from prehistory as a system for acknowledging and comprehending what has always seemed to be the other reality.³⁹ Systems varied in the ancient world, of course, according to the context and the times, and yet there are early paradigms of acknowledgment that support a developmental scheme. Nature worship was likely first, from a time when all there may have been for humans was nature—survival among the elements on the most basic level. Worship of

38. This is not a new idea in Christian thought. In the 12th Century, two Schoolmen, Hugh of St. Victor (1078–1141) and Richard of St. Victor (1123–1173), of the monastery of St. Victor in Paris made the claim for three ways of seeing. The names they gave to these ways have persisted among scholars of the Christian mystical tradition. These were “the eye of the flesh (thought or sight), the second was the eye of reason (meditation or reflection), and the third eye was the eye of true understanding (contemplation). See *Richard of St. Victor, Classics of Western Spirituality* (New York: Paulist Press, 1979), *De Sacramentis*, I, X, ii, and *The Mystical Ark* (Benjamin Major), III–IV. See also Rohr, Richard, OFM, *The Naked Now: Learning to See as the Mystics See*, The Crossroad Publishing Company, 2009, for an insightful approach to this principle.

39. Swedenborg speaks of the earliest humans, physically primitive but with a highly sophisticated spirituality born of direct experience of the spiritual world, heaven, and of the Lord himself. These people of the “Most Ancient Church” were characterized by “profound ideas of thought, and . . . such [spiritual] perception as cannot be described” (AC 607) But they perished, we are told, from an attitude that said, “If I am not instructed by the senses concerning faith, and the things relating to it, so that I may see them, or by means of knowledge that I may understand them, I will not believe.” (AC 126–128) From this attitude their spiritual eyes were closed, their internal perception was shut, and they suffered the spiritual demise depicted in the Genesis story of the Fall. (Compare this with the attitude from which the Naturalism in Swedenborg’s day and the scientific materialism of ours is derived; it is essentially the same.) The people to follow, those signified by Noah and his progeny, were more sophisticated in form and culture, but much more primitive in their level of spiritual perception, devolving into religions of nature worship, human sacrifice and polytheism. It is here that the historical narrative begins, leaving knowledge of the Most Ancients lost in myths of a “Golden Age.”

the cataclysmic power of nature was born of simple fear, to be sure, but this eventually evolved into a relationship of sorts, of supplication and propitiation, in a cause and effect system of belief abstracted from nature to come to rest above it.

At some point humans manifested their rationality by humanizing these forces with which they were now in relationship, and the gods were born, to entreat and to appease in a much more personal way than before. The forces of nature had personalities now, and could be visualized more clearly as human in character, and familiar. A person's fate was no longer as randomly assigned as before, perhaps, but it depended yet on the whim of these anthropomorphic gods. The dispensations of Divine justice were not yet systematic, not yet predictable, and there was little formula for appeasement with any real sense of security. The gods ruled and acted according to whim, and their behavior, as human as it was imagined to be, was not wholly comprehensible.

What is the "modern" end of this evolutionary pathway? As in the beginnings of this first eye on the world, the systems vary. Some still look to appeasement and intercession; some still dwell on the unknowable. The mysteries of the earliest religions persist, even in the most sophisticated of modern forms, as "mysteries of faith." Just as in the biological model, evolution develops new features to meet the necessities of the context and the times, but it installs these on top of old systems which are never completely abandoned. The past and the present always travel together.

Philosophy was likely born of perceived patterns in natural events. What had at first seemed random, and later capricious, was now perceived as part of an orderly series of natural events. The innovation that would produce philosophy was predictability, a most powerful system of thought that allowed for the formulation of rules based on observation and experience. The relationship between humans and the other reality was forever changed by this discovery. There was a shift, away from the theistic interpretation of events, because with predictable natural models, this was no longer a necessity. Crops grew if they were planted at the right time of year, no matter what the gods might say, and summer followed winter whether they were appeased or not. These were natural things that, once understood, seemed to operate on their own, in a system that required no spiritual relationship at all. Power now came in knowing how these natural systems worked.

And the other reality? Still there, perhaps, but now an order of magnitude removed—no longer above but adjacent to (if not frankly behind) the new paradigm of logic.⁴⁰

The power of the logical deduction of cause and effect from nature alone grew by explosive evolution into the philosophical systems of the Greeks. Each school was designed to explain not the other reality, but the experience of the one in front of us, that now seemed to be the only one. The very nature of reality was the question, and the answers came according to the philosophy that described it. And when that other reality would not completely yield, philosophy was brought to bear upon it, to complete it, perfect it, to help it square with the reality all around us. When religion would not capitulate to philosophy, philosophy embraced it, in the Schoolmen, Albertus Magnus and Augustine, and a flood of others to follow, all laboring to unite the two realities. From Aquinas to Descartes to Spinoza to Leibniz to Kant and finally to the atheistic existentialists of this day,⁴¹ philosophy has developed ever greater orders of magnitude away from the necessity for any other reality. Rationality and reason are the pillars that support it, and its predictive powers are awesome. But as we shall see, philosophy is a single eye, and used alone will report a far different reality than what is actually there in full perspective.

What can result from philosophy alone? *Naturalism* Swedenborg called it in his day. *Humanism* we called it in the century just behind us. In this new century I suggest that we call it what it truly is. Its name is *nihilism*, the final common pathway of all systems of denial, and it is the reason behind this study. A philosophy that denies all things except for those that give evidence to the senses is a philosophy of denial, Swedenborg's *negative*

40. It was the Greeks who made this momentous paradigm shift, moving away from the gods as arbiters of all things, to nature as arbiter of her own things. This did not occur at once, but as a series of ideas culminating in a new perception of the world. Plato gives us the essence of this shift, in the tension between those who hold to the immutable truths of nature given by the Sky-Gods, and the Sophists, who are just as sure that truth is not immutable at all, but subject to interpretation. Immutable, unchanging Truth v. relative experience: Once born, the problem has never gone away. (Plato, *The Sophists*, 360 B.C.E., in Plato, Cooper, John M., and Hutchinson, D. S., Ed., *Plato: Complete Works*, Hackett Publishing Co., Indianapolis, 1997.

41. As with any generalization there are exceptions, and in this case we must not include the theistic existentialists Soren Kierkegaard and Gabriel Marcel among those existential philosophers who operate from the assumption of a natural world alone.

principle, that leads not to “all intelligence and wisdom,” but to “all folly and insanity.” To reiterate what we have seen before,

There are two basic attitudes of mind, the first leading to utter stupidity and insanity, the second to perfect intelligence and wisdom. The first occurs when someone denies everything, that is, says in his heart that he is unable to believe those things until he is convinced by things which he can grasp in his mind and perceive with his senses. This is an attitude which leads to utter stupidity and insanity and must be termed the negative principle. The second occurs when someone regards affirmatively the things which comprise doctrine drawn from the Word, that is, when he thinks within himself and believes that those things are true because the Lord has spoken them. This is an attitude that leads to perfect intelligence and wisdom, and must be termed the affirmative principle. The more those who think from the negative principle consult rational ideas and the more they consult factual knowledge and the more they consult philosophical concepts, the more they pitch themselves headlong into darkness, till at length they deny everything. The reasons for this are that nobody is able from things that are lower to grasp with his mind those that are higher, that is, from those that are lower to grasp those that are spiritual and celestial, still less those that are Divine, since these go above and beyond his entire understanding. And what is more, when this is the case everything is regarded from a basically negative attitude of mind. On the other hand, however, people who think from the affirmative principle are able to confirm themselves by whatever rational ideas, and by whatever factual knowledge, indeed by any philosophical concepts, which they are able in any way to make use of, for to them all these matters are confirmatory and enable them to have a fuller idea of the matter. In addition there are those who are in doubt before they deny, and there are those who are in doubt before they accept affirmatively. Those in doubt before denying are people who are disposed towards a life of evil; and when carried away by that life, then insofar as they think about those matters they deny them. Those however in doubt before accepting affirmatively are people who are disposed towards a life of good; and when they allow themselves to be turned to that life by the Lord, then insofar as they think about those matters they accept them affirmatively.⁴²

42. *Arcana Coelestia* § 2568

Although this passage deals with human perception of divine truths of the Word and not observations of nature, it can be argued that since nature is of divine creation, then the principles of nature constitute divine truths, but on the natural plane. Working from this analogy, the affirmative principle becomes nothing other than the willingness to be led by the truth, from the context of an open mind. This is the ostensible goal of the scientific method. Yet in practice many scientists deny certain possibilities, such as spiritual causes for natural things, from purely ideological opposition.

Science is the newest of our three eyes—less than five hundred years old and born along the way, the offspring of empirical philosophy and pure reason. Along with Albertus Magnus and Thomas Aquinas was another of the Schoolmen⁴³ who deserves special attention for the evolutionary innovation he introduced: “Why not test your presumptions and conclusions, after you have refined them with the power of philosophy? See if you are right and only then move on.” What prompted the Franciscan monk Roger Bacon to suggest this step beyond deduction? A firm belief that philosophy, revelation and experience converge at truth.⁴⁴ But this idea, born in the thirteenth century, lay fallow, until another Bacon (Francis), claiming it for his own, made a method of it, and the scientists of the fifteenth and sixteenth would put this “scientific method” to powerful use. Science, a philosophy based only on what can be observed (experience) grew from the broader base of a philosophy that had allowed hypothesis to stand alone. The difference? Experiment, objectivity, and method. This powerful eye, (the most powerful, it has seemed ever since) is science.

What is the nature of these three eyes, in practice, where things like this really matter? How are they alike, and most importantly, how do

43. The “Schoolmen” were European university scholars of the 12th and 13th Centuries. They were monks of various orders who devoted their lives to teaching and philosophy. Their common effort was to bring Aristotelian philosophy and Christian doctrine into a harmony, by combining the philosophical power of the former with orthodoxy of the latter. So much did they all adhere to this program of scholarship, that “scholasticism” became slang for their common effort—the scholarship of the universities. This is cause for reflection on the monotypic materialistic and political philosophy characterizing our university faculties of the present day.

44. Roger Bacon, O.F.M. (c. 1214–1294), Franciscan monk, theologian, empiricist, alchemist, and natural philosopher, had the gift of prescience for human intellectual development to come, in the scientific revolution, but much further still, in the inevitable union of reason and faith which may at long last be dawning. This unsung polymath of the Thirteenth Century employed the “three eyes” approach to great advantage. See Booth, Mark, *The Secret History of the World*, Overlook Press, New York, 2008, pp. 266–269.

they differ? Why are they important? If truth—the knowledge of the way things really are—is honestly what we are after, then each of these eyes is important, because these are the three ways that we can arrive at truth. As we shall see, each is a different way, and no single way is best. This “new idea,” as old as Roger Bacon and Hugh of St. Victor, is really not new at all.

Theology is an eye that some will disqualify out of hand. It differs too much from philosophy and science because it is alleged that it is not empirical, is not testable, and is based solely on belief. So how can it be a valid window on truth? Recall its development. Theology is religion in other clothes, and is the refined response to the innate belief that there is another reality besides the one of our immediate experience. It has evolved, but not appreciably so in many of its forms, and its truth comes in a slippery form called revelation. Theology as a way of knowing is not for the timid. But is it testable? Is it a valid method? There are three logical approaches to these questions.

1. We are free to reject theology out of hand, as many people do. This simplifies things nicely, and the “problem” of a spiritual component to our reasoning is no problem at all. The progression of naturalism to humanism to nihilistic atheism employs this solution, in a system that denies any other reality. And for an atheist, things do seem to progress nicely without it.

2. We can accept a theological system blindly, and as adherents to our religion, labor to make all empirical evidence fit our system. Working from a limited agenda, the truth can be distorted in a multitude of ways, to agree or disagree with preconceived notions of reality. This way is no better than number 1, above. It also is too simple. It denies, at least to some degree, the empirical side of the equation. As a system of denial, it too flirts dangerously with the negative principle. “Creation scientists,” despite their good intentions, fall here, “reverse-engineering” the empirical data as they do, to fit the data of revelation.

3. What is left? An alternative to a false dichotomy: the application of the rational mind to both the “facts” of science and philosophy and the claims of revelation. This method is not simple, and as stated above, is not for the timid. But neither is it based on denial, out of hand, but on the affirmative principle that says “If there is another, spiritual reality, and if I can know something about it from revelation, and if this revelation is valid in its description, then I will find evidence to support it in the phenomena of the

natural world.” Is this proof? No, because experimental proof is an instrument of science, based by definition solely on confirmation by the senses. Our alternative is a rational proof, as commonly employed in mathematics and logic, that does not rely on sensory evidence, but produces conclusions that are no less “true”. It supplies “evidence to support a proposition,” to enlarge it, to flesh it out, even perhaps to perfect it, and hopefully to put it to use. What is the use? (See Part 2: Why bother?)

But revelation? Can the truths of nature and revelation occupy the same empirical system? This depends on the kind of revelation. All things evolve. In his theology Swedenborg describes a grand historical scheme for the spiritual evolution of the human race. In this history, we find that the very nature of revelation itself has evolved, along with the people, to fit their human condition of any given time. From direct influx into the minds of the most primitive humans, to the presence of human-appearing spiritual creatures (the angels, for instance who visited Abram, in the desert), to a face-to-face encounter for Moses, who took the revelation to the people, the nature of the message changed. The Prophets had spiritual dreams and waking visions—messages coming through them as passive vessels of revelation. Through such vessels the Scriptures became a written revelation. Swedenborg claimed to have discovered yet another level of revelation, in the internal, or spiritual sense of the Scriptures, related to the literal sense by spiritual-natural correspondence.⁴⁵ This level is no longer fixed, to be accepted by rote, but involves the reader in a running meta-analysis of simultaneous truth and deeper truth. Revelation has become an interactive relationship between the truth and the people who receive it.

If revelation evolves, then it too may be taking on a form that would allow it to join the empirical search for truth. If revelation were to lend itself to the scrutiny of experience, what a powerful tool it could be. What

45. Swedenborg’s doctrine of correspondence works on two levels that at first seem to be two different systems altogether. One is the causal, spiritual-natural relationship of spiritual substance to natural matter, mentioned already in several places and to be explained in detail below. The other is the relationship of literal words in Scripture and their spiritual meanings, which, when read simultaneously with the literal, form a spiritual meta-narrative based on the literal. This is a foundational doctrine in Swedenborg’s theological system, as correspondence serves as the medium through which the internal, spiritual sense of the Word comes through the written text into a person’s mind. See Appendix C: Correspondence, for a thorough treatment of this foundational doctrine. For Swedenborg’s own explanation of this meta-narrative concept, see Swedenborg, Emanuel, *Doctrine of the Holy Scripture*, in *The Four Doctrines*, Swedenborg Foundation, New York, 1884.

a perspective it might bring to the truth, as another angle on it, another eye to enhance our perspective.

Natural Philosophy is the application of the rational mind to the explanation of observed phenomena of the natural world. It can first describe and then explain, in general terms, how the world works. It paints a very big picture, but works from the confident premise that if this picture were perfect, then there would be no detail within it that could not be explained. Philosophy often labors under necessary detail, and for this it has earned a reputation of tedium, because everything in philosophy depends on the series of rational arguments supporting the system at every level. In a house of cards, each card must be very carefully placed. But far from tedious, philosophy embraces universals, and if these are correctly assembled, there is the excitement and confidence that it could explain all the particulars within its universe! But what is missing from philosophy is the necessity to put things to the test. The power of logic, on which early Greek philosophy was based, surpassed all other things. If an argument is in perfect form, then it is by definition valid. Experiment would have seemed an ornament, extraneous to such a beautiful system. The big picture does not lend itself to experiment, but to speculation, and philosophy.

It is science that delights in the details. Science is what happens when a premise is put to the test and the results are allowed to lead to universals. No cheating (wishful thinking, preconceived notions, or bias) is allowed, because this system, at least ideally, is objective. Science is the offspring of philosophy, but how different it has come to be. It is a rigorous method to suit all occasions, with its own rules of etiquette. It embraces and proves particulars ("facts"), and as enough of these are assembled, universals come into focus. Science is a reductionist philosophy of skepticism, powerful and elegant in its method. It has come to be the single source of vision for the people of this day.⁴⁶ Science works.

We have looked at how these three systems of knowing are related. But there is yet another way. Each of these is incomplete as a method to find the truth. Each is one eye alone, which sees the truth, in its own special (but limited) way. Are they different? Yes. Are they similar? Yes. Can they

46. For scientists, the power of their method precludes the necessity for philosophical or metaphysical perspectives; for the laity, science is technology, the power of which is essentially limitless. Our philosophy and theology eyes are not necessarily rejected out of hand; they have simply been eclipsed by science in the modern world.

be compatible? They must be. Traditional philosophy has explained things from the top down, deals with generalities, like knowing, existence, and the nature of matter, and deals with the Big Picture. It is systematic, and desires to provide universals. It will explain details from these universals, if it is good enough. Science is not philosophy, but the reciprocal of it, in a way. It deals with details, explains things from the bottom up, and will explain the Big Picture if it is good enough.

But where does theology fit into this scheme? Philosophy and science are obviously related and even complementary, but theology? Does it really fit at all? Some would be quick to say no. Many are slow to respond to this question. But here is a possibility: Theology is the third side of a great trinity of knowing—three intellectual disciplines, all striving to achieve the same objective. Philosophy explains universals, and does this from prior experience. Science explains details and does this by means of experience. Theology explains the same things, some details, some universals, but it does so from revelation. This is the attribute that sets it apart, and sets it outside the game, for rationalists, who will say, “But theology is untestable.” Not necessarily. Revelation deals in the ineffable, to be sure, but it also reveals the nature of the things we experience. If it is good theology, these things will also prove true when held up against the scrutiny of experience. Testing? But that would be science, in a way, now wouldn’t it? And if a philosophical system is good philosophy, then it too will prove true against experience. It all boils down to experience. The source of our knowledge matters little, if our conclusions are consistent, coherent, comprehensive and provide for sensible moral consequences.⁴⁷

Truth is what this is all about. Science, philosophy, and theology all seek the truth. All attempt to explain the same reality. The all is one. We must use all three of our eyes. We must do good science, and this means honest science, a difficult thing to do, given the inherent weakness of human nature. We must do good philosophy—rational, critical thinking that can order the knowledge that we acquire. And we must do good theology, based firmly on the best revelation, applied in an objective way. What is

47. These four qualities are criteria for evaluating general systems in any context; what matters here is that theology can provide conclusions of the same value as either philosophy or science. The key to the epistemological equivalence of our three eyes is that each must provide for “good” philosophy, theology and science—that they produce conclusions according to valid processes inherent to each.

the best revelation? Revealed truths that square with our own experience. And what is the objective way? Acknowledging these truths and living according to them.

It is impossible, of course, to do perfect science, philosophy, and theology. This is because we are subject to imperfect reasoning, imperfect measurement, imperfect interpretation of data, and even imperfect revelation (revelation comes accommodated to our receptive states—hardly perfect vessels, that can distort the message). Our three eyes will never be aimed exactly at the truth in the center of the great triangle of science, philosophy, and theology. But we must keep at it, keep moving around that triangle, keep adjusting the focus and returning to the problem, until the image clears.⁴⁴⁸⁸

As we practice this exercise, the apparent differences between these complementary disciplines will melt away, and we will begin to see the truth with astonishing clarity.

WHY A SPIRITUAL FRAMEWORK?

A framework of spiritual principles makes “seeing” the spiritual causes of natural things easier, because as they are arranged on it, the relationship of these things to one another is revealed. This is the “affirmative principle” at work, providing the model to both work from and build upon.

In the Introduction to this section the case was made for approaching the problem of spiritual reality from Swedenborg’s affirmative principle, an attitude of mind that strives to see the spiritual in the natural by using the eye of the rational mind. Then I suggested that there were three such eyes, which, when used in concert, allow us to see much more clearly than with only one, or two. In Chapter Two I made the claim that there was practical

48. Found in the work of German philosopher Martin Heidegger, this process has been termed “the hermeneutical circle” or “spiral,” and is described by Vaezi as “the existential character of human understanding, described in terms of an existential grounding. The hermeneutical circle is the existential condition of human understanding and is an essential attribute of knowledge. Thus the circle of understanding is not a methodological circle, making it unnecessary for us at the end of the process of interpretation, but it describes an element of the ontological structure of understanding.” From “The Hermeneutical Reflections of Heidegger,” by Vaezi, in www.beyng.com, (<http://www.beyng.com/hlinks/hherm.html>), accessed on 02/14/15.

utility in seeing the spiritual causes of natural things. It provides an order for the data, as they are gathered and confirmed; it gives them a place to exist within the context of a model of reality. This in turn makes them more useful because they are connected to one another in a rational series, and each is more easily retrieved from the context for application. But without further explanation these are just words, and this is just a claim. Of what practical use is a framework of spiritual principles?

As always, we must begin with a statement of faith. All systems of knowing are by definition axiomatic, and as such all philosophies, all religions and even all the sciences are built not upon facts, but upon axioms, kernels of belief at their core. As defined above, an axiom is a self-evident principle that is hypothetically, but not demonstrably true. That is the best we can do at the level of first principles. But as distressing as this may seem, especially to scientists who find comfort in “hard data” and objective findings, it is comforting for the base of freedom—intellectual and spiritual—from which it compels us to operate. We are free to choose our paradigm, and we are free at any time to abandon it as well, if it fails to deliver.

So all roads lead from a “statement of faith.” For the naturalist, the creed is simple and powerful:

I believe only in the things that are reported and can be verified by the senses, that are not subject to opinion or sentiment. I believe only in the things of natural experience that operate by means of natural laws.

There is no necessity for spiritual reality in this attitude of mind, and a person can operate happily and effectively from this point of view. Many people do.

The spiritual paradigm used here reflects a belief in something higher or interior to the external reality of the senses. It certainly doesn’t deny this reality; it sees it as part of a larger reality, a subset of experience at one level that is in some way associated with experience at another. This other experience operates according to a different set of rules and is reported in a different language. A spiritual statement of faith might say:

I believe that there is more to existence than sensate experience alone. From this it follows that there is a spiritual existence as well as a natural one.

But here the statement must end, before it has any teeth, unless we can provide it with some idea of how this spiritual existence works. This is the enduring problem with the yearning for spirit: striving to understand it, and yet having no objective mechanism to explain it. This statement alone is tentative, wishful thinking. As Part Three warns us, we are in need of a pragmatic model of spiritual reality if we are going to assert its existence. Ockham's razor will favor the system that makes the most sense.⁴⁹ We need a spiritual model that makes sense, and we need the means to deliver it. Emanuel Swedenborg has given us the materials for both, if we are willing to take his hard-won spiritual principles and use them to build an expanded statement of faith for the new millennium. Here is how such an expanded statement might read:

I believe that the experience of science is compatible with a universe of intelligent spiritual cause. This requires that there be something outside of nature, i.e., a metaphysical reality. I believe that spirit and nature are causally related, and that the created universe is the result of order itself (intelligence) manifested in forms that operate within natural processes. I do not believe in magic; I do not believe in interventional miracles that contravene these natural processes. I believe that spiritual reality is objective—rational and operating within the comprehension of human experience. I believe that this paradigm can be appreciated only from the “affirmative principle” that works from spiritual to natural reality, and strives to see spirit at work in nature.

This is not an attitude of blind faith; this is much better than that. Blind faith is Swedenborg's *negative principle* at work, denying all things that cannot be confirmed by the senses. This is a statement of faith with some form to it; it is beginning to take shape. But it still begs for a mechanism, so let's continue:

49. *Pluralitas non est ponenda sine necessitate*, wrote Franciscan friar and scholastic philosopher William of Ockham, around 1320, to underscore a principle of his nominalist philosophy. Generally mistranslated as “Entities are not to be multiplied beyond necessity,” this admonition has come to be known as the parsimony principle: “Given two theories that explain the known facts, use the simpler until you find a reason not to.” It has proved valuable in the evaluation of scientific theories. Murray, Charles, *Human Accomplishment*, HarperCollins, 2003, p. 238. One is tempted to find these roots of medieval scholasticism in the vernacular KISS principle.

I believe that spirit flows into nature in a directional system of causation; natural things have spiritual causes. The mechanism of this relationship is by means of the influx of spiritual substance into natural matter, not directly, but in a series of well-defined intermediate levels of creation. Each level of descent is a little less spiritual and a little more finite, until the result is inert natural matter. God is not in this matter (nature is not God; we are not gods), but interacts with it, by means of the continual, stepwise influx of spiritual substance into natural vessels.

The functional relationship between spiritual substance flowing in and the natural matter that answers it in form is the corresponding function between the two ends of this causal series. Spiritual cause and natural effect both do the same thing (share a common purpose), but each in its own world and way. Unity of cause and effect is from unity of purpose.

God provides the order for this continuous creation because God is order itself.⁵⁰ This order is manifested in the human form.⁵¹ In the presence of energy, all things of creation strive to attain this form and order; the structure of the universe is testimony to this principle. Life is able to build up to incredible complexity because it can harness energy for this purpose—creation according to the “image and likeness” of God.

Here, finally, is a workable statement of faith for the spiritual paradigm. It is methodical and pragmatic, and suggests both a structural scheme and a mechanism for a very difficult problem. At its core lies order, and order

50. In True Christian Religion §§ 50–70, Swedenborg explains that “the omnipotence, omniscience, and omnipresence of God cannot be recognized except through a knowledge of order” because God is order itself. As such, “he introduced order into the universe with its creation.” Taken out of context, this statement might seem to raise the question of attachment, as it can be read to imply a pantheistic connection of God to nature. But having previously solved this problem prior to this, his last book, Swedenborg means no such thing.

51. Swedenborg embraces the archetypal image of creation in human form in many places. Here are two clear statements of this teaching from his works: “Whatever proceeds from God partakes of the human form, because God is Himself Divine Man; this is especially the case with the soul, which is a person in its beginning.” (*Invitation to the New Church*, § 48) “Animal form derives its conatus to such things from the First from whom all things are, who is God, because He is Man. That all things of nature strive after that form, and that the ethers have impressed upon them and so implanted in them from the spiritual an effort to produce that form, is evident from many things; as from all vegetation on the surface of the whole earth, also from the vegetation of minerals into such forms in mines, where openings exist, also from the vegetation of cretaceous substances into corals in the depths of the sea, and even from the forms of snowflakes that emulate plant forms.” (*The Apocalypse Explained* § 1208)

is intelligence. Order is a creative force because it goes forth (“cannot keep from going forth,” the Kabbalists would say) in Creation.⁵² As it creates, the natural matter generated by correspondence with spiritual substance cannot but reflect this order in itself (“the image and likeness of God”), and forms are generated to fill the earth. As long as energy flows into the system it will operate forever. Energy must represent this creative spiritual force in the natural world—must correspond to it, Swedenborg would say.

But as always, there are problems. By means of the affirmative principle we may be able to “see” the components of this model, but this is not the same as objective (scientific) confirmation. For many, seeing only with this single eye, this model will be so much enthusiastic speculation. On the other hand however, science cannot confirm many of its own central beliefs. Foundational theories such as evolution, quantum reality, the curious state of singularity prior to the big bang, even gravity—these and more are predicated from axiom, not experience. These too are conceptual models in the absence of sensory proof. They serve well as frameworks upon which to arrange the facts of science, but they are one-dimensional frameworks, limited by the perspective of a single eye.

In the absence of this kind of proof, we must look to strengthening the spiritual model. We must pay particular attention to the idea of correspondence, because this principle is the key. Swedenborg learned this the hard way. We do not understand this principle well enough, and until we do our model will not be complete; this is the principle that makes the

52. In the Lurianic tradition of Jewish mysticism, once “the elevation of the heavenly light without limitation” began, then from it came into being “the Great Light called Primordial Man [*Adam Kadmon*], preceding all emanated beings.” “It would not have been possible to delay the creation of this world, for each world was created after the creation of the one above it. All the worlds were created, expanded, emanated and continued one below the other, at different succeeding times until the time of the creation of this world was reached.” *Ein Sof According to Isaac Luria* (‘Etz Chaim’, shaar 1, anaf 1, in Unterman, Alan, Ed., *The Kabbalistic Tradition*, Penguin Books, London, 2008). Swedenborg echoes this necessity to create in his depiction of unknowable God (*Esse*) going forth as *Existere*, the Divine Proceeding. It is in the nature of God to move out into creation, in a succession of steps, each related to the one above and the one below. This becomes a central theme of spirit’s ability to come into nature in an orderly way. (See Bell, Reuben P., *The Necessity of Receptive States for the Ultimatum of the Divine, Proceeding as the Holy Spirit, from The Infinite to the Soul of Man*, a thesis submitted in partial fulfillment of the requirements for the degree of Master of Divinity, Academy of the New Church Theological School, Bryn Athyn, Pennsylvania, 1997, for a detailed discussion of this process.)

model make sense. The 1990s were proclaimed “the Decade of the Brain.”⁵³ Perhaps it is time to proclaim such a “Decade of Correspondence.”

Because of the nature of the problem at hand, “proof” in the limited scientific sense will of course never come. We seem to be stuck in the most classical of quandaries: two opposing belief systems, with neither able to overcome the other. But this is neither good nor bad. This is spiritual freedom at its best. Both paradigms address spirituality at their most basic levels. One affirms spiritual reality, and the other denies it. One aspires to see spiritual principles at work in nature, and the other looks only for the natural causes of natural things. We are all free to believe what we like, and to choose the philosophical starting point that suits us best.

But because of the particular objectivity of science, because of the necessity for “proofs” of sorts, according to its uniquely limited method, and because of the cumulative, visible progress this method provides, there is a certain understandable arrogance by some that scientific materialism is the superior paradigm. As compelling as this attitude may be, it is not necessarily the best assumption. From the perspective of all three eyes, the spiritual paradigm proposed here has some very compelling attributes: It is universal; its mechanism provides for operation in and between both worlds. It is reasonable: like it or not, it makes a certain amount of sense. It does not require magical thinking. It does not require that some evidence be embraced and other evidence ignored. It is a framework that can be built upon. And in its own way this model too is objective: it invites skepticism, criticism, and comparison with experience.

Early in his career, Emanuel Swedenborg resolved to pursue the elusive goal of identifying and locating the “seat of the soul” in the body. This was not a particularly audacious goal. Descartes and other natural philosophers had seen fit to try it, and the application of science to confirm a theological principle would not seem an incongruity for some time yet, as the history of

53. On July 17, 1990, President George Bush proclaimed the last ten years of the Twentieth Century the “Decade of the Brain.” The proclamation begins with this inspirational message: “The human brain, a 3-pound mass of interwoven nerve cells that controls our activity, is one of the most magnificent—and mysterious—wonders of creation. The seat of human intelligence, interpreter of senses, and controller of movement, this incredible organ continues to intrigue scientists and layman alike.” His casual use of the word “creation” is curious, dropped as it was into a statement that otherwise avoids any reference to metaphysical properties of the brain. Thus must the spiritual-natural paradigm fly under the radar of scientific materialism. (Presidential proclamation #6185 accessed at <http://www.loc.gov/loc/brain/proclaim.html> on February 20, 2013.)

science was then unfolding. He was aware of failures in this effort, by others at least as capable as himself. So after what seemed to him an inauspicious beginning at speculating on the nature of the nexus of soul and body, and describing the soul's operation by means of the medium of the blood, he stopped his research, and decided to begin again.⁵⁴ This time, after more study and meticulous preparation, his focus would be on the human body, but culminating in the brain itself, the soul's domain, and the nexus of spirit and nature. In a series of works to come, he would finally climb up to the soul from the grosser parts of its domain. This series, called *The Soul's Domain*, was ambitiously planned to finish the job.⁵⁵

Two things about this project are worthy of special attention. First, Swedenborg, precocious, impatient, and prone to haste, was this time starting from a broader base of preparation. Extensive anatomical studies⁵⁶ and the recent experience of great conceptual difficulties were fresh in his mind. A plan resulted from these defining realities. Second, at this point in his career, Swedenborg was considering just how the power of the scientific method might be brought to bear on problems of a spiritual nature. Philosophers before him had speculated on the soul's domain, but from the *a priori* armchair of philosophy and textbook anatomical knowledge. Starting at universals, in what Swedenborg called the *synthetic* method, they reduced

54. In *The Infinite and the Final Cause of Creation and The Mechanism of the Operation of the Soul and Body* (1734) Swedenborg had attempted a brief treatment of the "contiguum" of fibers and membranes extending from the body's grossest level inwardly, to the level of the soul. He was dissatisfied with this effort, as it could not clearly situate the soul, and could not avoid a pantheistic connection of the grosser natural levels with the inmost spiritual ones. In *Dynamics of the Soul's Domain* (1740), a much more substantive study based on extensive anatomical studies, we find the soul, descending from its source in the brain above, distributed about the body by means of "the bloods." But he was unable here to clearly identify this source—the *nexus* where soul and body interact. He felt that these early studies were premature and incomplete.

55. Swedenborg planned a complete *Soul's Domain* series of seventeen parts, to include earlier work as well as work to come, edited into an exhaustive exploration of the human body, its soul, and the interaction of the two in operation. See the "Preface to 1960 Photo Offset Edition" in Vol. I of Swedenborg, Emanuel, *Animal Kingdom* (1744), Swedenborg Scientific Association, Bryn Athyn, Pennsylvania, 1960, for an excellent outline of Swedenborg's plans for the culmination of his physiological studies.

56. In 1736, Swedenborg, then forty-eight years of age, suspended his research and writing to enter into an intensive two-year course of study in Paris, at the School of Chirurgery and Dissection, where he devoted himself to studies in anatomy and dissection, primarily devoted to the human brain. Following this hiatus, he produced a major work on the brain, called by his editors the "Venice Work," and subsequently published posthumously as the *The Cerebrum*. Acton, Alfred, *Translator's Preface* to Swedenborg, *The Cerebrum*, Swedenborg Scientific Association, Bryn Athyn, Pennsylvania, 1938.

the problem to smaller and smaller parts. Swedenborg's aim, in this new work, was to actively seek the soul by applying the methods of objective science, but in a novel way; he would work from effects back up to causes the *a posteriori* way, from particulars to universals, by the analytic method he was sure no one else had tried before. There is excitement and anticipation in his writing of this period, and not a little arrogance.⁵⁷

In the Prologue to the first work of this series he shares this thinking with us, in a philosophical appeal to reason. We can see his mind at work in this introduction to the next level of his research program. The rational mind is constructed to see truth by nature of the soul, which flows into it. Order is inherent in the soul, he says, and order likewise is the chief characteristic of truth; "congruous or harmonic to it."⁵⁸ A truth is the conclusion of an infinite series of other truths that constitute it; there are absolute truths and constant truths, but truths in the rational mind are complexes of truths, and are better called principles.⁵⁹ It is these truths in complex that he is seeking beyond all others, to assist him in his explorations. They were the keys to his success.

Truths can be discovered by *synthesis* or *analysis*. *A priori* synthesis is the method of old, from the "infancy of philosophy," that goes from the goal to the starting place, and by this it can never truly attain the goal; the truth is lost in a series of plausible arguments, and falsehood can assume the form of truth.⁶⁰ This method of divining true principles by the mind alone and descending from them to posterior things, belongs exclusively to

57. "To find out the causes of things from the study of given phenomena certainly requires a talent of a peculiar kind. It is not every one that can confine his attention to one thing, and evolve with distinctness all that lies in it: it is not every one that can think profoundly, or, as Cicero says, 'that can cast up all his reasons, and state the sum of his thoughts' . . . We see that some men come into the world as prodigies endowed with superhuman powers of memory; others with an extraordinary activity of the whole faculty, amounting to a peculiar strength of imagination and intuitive perception . . . Those who are born with this felicity of talent, and afterwards proceed in due order to its development, the more profoundly they penetrate into the depths of science." In § 19 of the Introduction to *Economy of the Animal Kingdom (now Dynamics of the Soul's Domain)* (1740), we find a young, impatient, self-important Swedenborg, about to embark on his first major anatomical work. In his description of what kind of scientist is capable of doing this kind of work, we are given some insight into the state of his personality at the time. It is in stark contrast with the humility that will come in a few short years, as he evolves from a "prodigy endowed with superhuman powers" to "Servant of the Lord."

58. Swedenborg, Emanuel, *The Animal Kingdom*, Swedenborg Scientific Association, Bryn Athyn, PA, 1960, § 2.

59. *Ibid.*, § 4.

60. *Ibid.*, §§ 6–10.

higher powers, to spirits, angels, and to God, says Swedenborg, unlike the human mind, which reasons by necessity from the senses, our only way of attaining truths so long as we are in the body. What an ironic statement this is, preceding as it does Swedenborg's transcendent experiences to come!

Analysis on the other hand, or reasoning from effects to causes, reduces all observations into order, and lays a foundation for the house. It is the only sure way, to principles and truths—"to high and almost heavenly things."⁶¹ By now Swedenborg has learned, through trial and error, that we can climb the ladder of the senses only just so far. Although we can come very close to it—close enough to know something about it, perhaps—we will never find the nexus. He is finally becoming aware of the natural limitations of the search, and yet he is still the champion of analysis over synthesis for finding truth. We cannot ascend all the way to the soul, but we can ascend into its light. Now is the time, he says, to abandon the ancient synthetic method and begin a study of the human body by analysis.

He tells us what he intends to do. He will detail the anatomy of the human body—parts of parts of parts—but then he will assemble them again, using the grand spiritual principles behind the whole. And it is here that we find these principles, the means to deliver the model. Simply saying that there is spirit was not enough for Swedenborg, just as it is not enough for us. He will make sense of the soul's domain, because it is the model for all spiritual-natural interaction. If we find it here, we will find it in all cases, because the mechanism is the same. This is the source of Swedenborg's excitement. To see the soul at work is goal enough, but to use this discovery to explain the mechanism of interaction of all Spirit with all nature—this was his greater ambition.

The plan was to climb up to the soul by studying the place where it resides. He would do this with the assistance of his "doctrines"—those powerful spiritual-natural principles—by means of which it operates. They are the doctrines "of forms, of order and degrees, of series and society, of communication and influx, of correspondence and representation and of modification."⁶² These universal principles he was determined to discover, define, and apply towards a new understanding of how spirit and nature interact. The era of the rational pursuit of spiritual principles underlying

61. *Ibid.*, § 12.

62. *Ibid.*, § 17.

natural things had begun. It was clearly time to apply a spiritual paradigm to the natural sciences in 1744, when Swedenborg, sensing the gravity of the moment, extends this invitation:

Let us then gird up our loins for work. Experience is at our side with a full horn of plenty. The nine virgins are present also, adorned with the riches of nearly two thousand years: I mean, all the sciences, by whose abundance, powers, and patronage, the work is constructed. The sciences are indeterminate and of no profit or advantage, unless they be applied and made subservient to uses. What is a knowledge of numbers, ratios, figures, and forms, in arithmetic and geometry, apart from its benefits in civil life? What are the philosophical sciences, with their predicates, qualities, modes, and accidents, without they have reference to reality? All things, at the present day, stand provided and prepared, and await the light. The ship is in the harbor; the sails are swelling; the east wind blows; let us weigh anchor, and put forth to sea.⁶³

All the accomplishments of our modern era notwithstanding, the ship still lingers in the harbor. The east wind continues to blow, stronger now perhaps than ever, but there has been strong resistance to the voyage these last two hundred and fifty years. The anchor has come up at times, only to be dropped again by the sheer elegance of pure science as it has become—a single but commanding eye on nature. But the ship will sail. Natural things do have spiritual causes, and the new century promises to be kinder to the spiritual-natural paradigm than the last one was.

Swedenborg has left us with the components to build this paradigm. He was not concerned with finishing his *Regnum Animale* once his spiritual eyes were opened and his perspective improved by a quantum leap; he was off to infinitely bigger and better things.⁶⁴ But he took his principles with him, and applied them in new ways, to learn ever more of spirit and nature in operation, this time from the other side. What's in it for us? Plenty:

63. *Ibid.*, § 23.

64. See Acton, Alfred, *An Introduction to The Word Explained: A Study of the Means by which Swedenborg the Scientist and Philosopher Became the Theologian and Revelator*, Academy of the New Church, Bryn Athyn, Pennsylvania, 1927, for a detailed account of the tumultuous events of Swedenborg's transition from his scientific to his theological period.

When spiritual light is cast on natural things their real cause, true purpose, and proper use are seen. The use intended by the Lord in the creation of the forces and objects of nature, and thus the proper use of them in relation to human needs, is revealed; and, most important of all, the Lord Himself is seen; for when natural things are so regarded, the Divine love and wisdom are seen at work in creation, are seen as the Divine of use.⁶⁵

This is the power of the spiritual paradigm. Swedenborg has provided us with its philosophical and spiritual building blocks. It is time to return to these great principles, build a framework, and finish the job.

THE SPIRITUAL PRINCIPLES

The creator is order itself

Nature, despite all appearances, is not random in its operation, and what we observe falls within a new paradigm of causation: order from order, as its image.

What do we see when we observe the natural world? What first comes to mind might well be the marvelous order in all things, all processes and all their interactions. Certainly an eye trained in the sciences will see the causes behind the phenomena, and appreciate the web of interactions at every level. But another eye, no less disciplined in reason and observation, might just as well see the chaos and randomness that is ostensibly there as well. Both these responses would be correct, in the contexts of their expectations.

It might be naive to believe that an atheist would be inclined to see disorder, and a religious person order. What of the atheist who “sees” the same order, but from his or her foundational axiom of “all things of nature from nature”? What of an atheistic scientist? The problem comes not in seeing the order, but in explaining it. Confined to the natural world for the origins and interactions of all things, and limited by the logical principle that order must come from order, then there is no other option than that “natural order” results from the operation of “natural laws” or the physical

65. Henderson, W. Cairns, *Homiletics*, notes in use by the Academy of the New Church Theological School, Bryn Athyn, PA, pp. 42–43.

laws of nature. This works perfectly well to explain present operations, but it does not stand the test of extrapolation, backwards to origins. All that remains is the axiomatic belief that nature and its highly ordered state is from the same nature that exists in a highly ordered state. There is an obvious and inescapable circularity to this conundrum, that generally goes unchallenged. Energy can sustain an orderly universe that runs by physical laws, but energy cannot manifest the order that it sustains. Sustainance bears no relationship to origins, and it is the origins of an orderly template governing the current state that is missing from a materialistic explanation for order and enthalpy in the universe.⁶⁶ Without energy, orderly systems move towards a state of entropy, or randomness; but energy is not order. This philosophical dead end is the scientific materialism of the present day—the naturalism of Swedenborg's experience.

But what of the religious person who sees the same order? Despite an axiom that allows for spiritual-natural interaction, can it be explained any more convincingly than the materialistic gloss? One historical solution has been a natural universe into which God emanates.⁶⁷ But rather than explaining the order, this model simply relegates natural order to divine order, now present in nature, which, by logical extension, *is* nature in a pantheistic fusion of the two worlds. This is really no more consistent than scientific materialism, representing as it does its perfect opposite: rather than no God, everything is God, and there is still no rationale for the operation of free will. There are remarkably few other attempts to explain this problem of distance/connection by the Judeo-Christian tradition, beyond reliance on the inadequate argument for miracle, or "mystery of faith." The Judeo-Christian tradition simply does not have the doctrines to support the claim of divine order as the creator and sustainer of all things.

66. Enthalpy is the energy content of a process (chemical, thermodynamic, mechanical, etc.) that can be recovered. It is also described as useable energy. In this way, it is related to the order in the universe, as this energy is applied to the building up of things. Entropy (also called free energy) is the energy content of a process (chemical, thermodynamic, mechanical, etc.) that cannot be recovered. It might also be described as chaos.

67. A universe composed of ten divine attributes emanating into nature is found in the earliest Kabbalistic works, appearing in the 1st century CE *Sefer Bahir*, (*Book of Illumination*), then in the 2nd century *Sefer Yetzirah* (*Book of Formation*), and later enlarged upon in the 12th century *Zohar* (*Book of Splendor*). Central to Jewish esoteric spirituality, the concept nonetheless most likely originated with Neo-Pythagorean mysticism to be adopted for Kabbalah. See Sholem, Gershon, *Kabbalah*, Dorset Press, New York, 1987, for a discussion of the importance of this concept to Jewish mysticism.

“Religious” people, despite their willingness to “see” God in nature as a function of the marvelous order there, are nonetheless poorly equipped to explain the origin and operation of that order. Swedenborg was aware of this limitation. In *True Christian Religion*,⁶⁸ written at the end of his life to summarize and clarify his singular doctrinal positions, he explains that without a clear notion of God—who and what he is and how he operates—any further theological discussion would be useless. In Chapter One, “God the Creator,” he explains that God’s single underlying essence is order. This, he says, is basic to all other things. Then he explains, in the precise language of a philosopher, that it is this order that explains everything pertaining to creation. “God is order itself,” he says, and “man is created a form of that divine order.”⁶⁹ By realizing the centrality of this principle, Swedenborg immediately rose above the irresolution concerning creation, spiritual-natural interaction, free will, and human form. It is the latter of these that will concern us most, in the next, final section.

This idea of the Creator as the source of all order provides the basis for a compelling theistic science. What is important here is whether or not this idea is borne out in nature and in our experience of it, or is it just philosophizing? We can approach this problem with a question: What if this divine order were found *in* the apparent randomness and chaotic activity of nature? What if the “randomness” were the operation of order, on a grand scale—so grand that we could not appreciate it because we are *inside* the system? What if order were the forms . . . in this case not shapes, but the inherent way things are related? In *Divine Love and Wisdom* § 29, Swedenborg explains it this way:

Love together with wisdom in its very essence is in God. This no one can deny; for God loves every one from love in Himself, and leads every one from wisdom in Himself. The created universe, too, viewed in relation to its order, is so full of wisdom coming forth from love that all things in the aggregate may be said to be wisdom itself.⁷⁰

Perhaps we do not see the order as order, because we are inside the “aggregate.” From this premise it follows that God in nature as this

68. Swedenborg, *True Christian Religion*, Swedenborg Foundation, New York, 1984.

69. Swedenborg, *True Christian Religion*, §§ 65, 66.

70. Swedenborg, *Divine Love and Wisdom*, § 29.

“aggregate” is the relational scheme that holds all creation together, in a dynamic web of interactions on an almost infinite number of levels.

Is God detached from this scheme? Is ours a Deistic universe? Hardly. Creation is continuous, and it descends by a series of discrete steps, creating a structural separation of things from God, while maintaining a functional bond of interaction.⁷¹

Love and Wisdom, the two essentials coming forth from *Esse*, the God above all comprehension,⁷² supply the basis for all creation to proceed as *Existere*, God coming into our comprehension as Creator. The created universe with respect to its order is full of wisdom coming forth from love, so that every created thing in aggregate is wisdom itself. All things are in order (successive and simultaneous)⁷³ and when taken together, they make a one. From this it follows that everything is connected in a grand relational scheme.⁷⁴ The all is one.⁷⁵

In the series of passages in *The True Christian Religion* mentioned above, Swedenborg unravels this concept of divine order in Creation. In § 52 we find that “God is order, and he introduced order into the universe and all its parts simultaneously with its creation.” Order here is defined as “the quality of the arrangement, determination, and activity of the elements which constitute a form. Perfection of imperfection result from the quality of the order.” Order, then, defines a form. What is a form? The relationship of all things (components) to one another. Shape has virtually nothing to do with form. What is the perfect form? That form emanating from *Esse*, which is the human form.⁷⁶

We find that God is order “because he is substance and form itself. Substance, because all things subsist from him, and form, because quality

71. To address the mechanism for this very delicate balance of separation and interaction required the doctrines of forms and degrees, which were formulated as the need arose.

72. This is the *Ein Sof* of the Kabbalah—“No Thing”—or God above all comprehension, from which all things emanate. In the biblical narrative, this was the “I AM” appearing to Moses in the burning bush, identifying itself only as the first person singular form of the verb “to be.” Such is God at the highest level.

73. These terms will be defined in the section on Swedenborg’s doctrine of series and degrees, to follow.

74. Swedenborg, *Divine Love and Wisdom*, § 29.

75. This is one of the most ancient expressions of a universe of reciprocals—of complementaries rather than opposites—found in the seminal religious systems in the world, and finding its way into western philosophy as monism of various types.

76. Swedenborg, *True Christian Religion*, § 66.

of substance springs from him. And the source of quality is form.”⁷⁷ Why is this? Consider the relational series: God is substance and form (above); God is love and wisdom,⁷⁸ wisdom from love constitutes form,⁷⁹ the state and quality of form are according to the order that is in it (above); God is order itself.⁸⁰ All Creation therefore participates in this perfect, divine order.

This is not circular reasoning; Swedenborg’s reasoning defines the perfect circle of creation: divine wisdom (*Existere*, coming-into-being) emanating from divine love (*Esse*, being itself) is manifested as the human form divine.⁸¹ This form imposes its own order onto creation as divine coming-into-being proceeds into nature. This is the order of the human form, and is God himself, implanted in nature at the most minute, foundational level, not as nature, but one degree apart from it. From this will spring all natural forms. These forms reflect their source in the divine, and as we shall see, are responsive to the divine by means of correspondence.

Here, in this circle of creation, we find Ezekiel’s “wheel in the middle of a wheel,” which is to say, here is the operational principle of God within creation.” The spirit of the living creatures was in the wheels, and the “wheels in the middle of the wheels” constituted a dynamic, intermediate

77. *Ibid.*, § 53.

78. “In God-Man Divine *Esse* (Being) and Divine *Existere* (Coming-into-being) are one distinctly. And because Divine *Esse* is Divine Love, and Divine *Existere* is Divine Wisdom, these are likewise one distinctly. They are said to be one distinctly, because love and wisdom are two distinct things, yet so united that love is of wisdom, and wisdom is of love; and since wisdom derives its *Existere* from love, therefore Divine Wisdom also is *Esse*.” *Divine Love and Wisdom* § 34.

79. “Love is the whole of wisdom, and consequently the essence of the heavens is love, and their coming-into-being is wisdom; or what is the same thing, the heavens are the product of Divine love, and they come into existence from Divine love by means of Divine wisdom.” *True Christian Religion* § 386:2.

80. “The omnipotence, omniscience, and omnipresence of God can be clearly understood only when it is known what order is, and when it is known that God is order, and that He introduced order both into the universe and into each and all things of it at the time of their creation. Order is the quality of the arrangement, determination, and activity, of the parts, substances, or elements, which constitute a form; from which is its state; and its perfection is produced by wisdom from its love, or its imperfection is the outcome of unsoundness of reason from cupidity. In this definition substance, form, and state are mentioned, and by substance form also is meant, because every substance is a form, and the quality of the form is the state of it, while perfection or imperfection of state is a result of the order.” Swedenborg, *True Christian Religion* § 52.

81. “It should be known that all things emanating from the sun of the spiritual world, in the midst of which is Jehovah God, answer to the human form. Consequently whatever comes into existence in that world combines to make a human form, and in its inmost parts exhibits that. Thus all the objects displayed to view there are representative of the human body.” Swedenborg, *True Christian Religion* § 66.

principle uniting the creatures and the wheels. This study seeks a clear, working definition for this uniting principle, so that we may identify its role in the origin of organic forms.

Creation is a unity of independent elements, but each participating by unanimous action in the whole. “Each thing was created into its own order, and designed so that it was conjoined with the order of the whole universe. This is so that each thing might have its subsistence in the universal, and thus be an element of the whole.”⁸² The human body is an excellent example of this principle: it consists of countless parts, each in its own order (function), yet together a whole body. All animals and plants are created in their own order, likewise even the elements of the mineral kingdom. Each component of the universe has a particular function (order), but is also a participant in the whole, as stated above, in *Divine Love and Wisdom*, § 29.

In *True Christian Religion* § 55, Swedenborg expands this concept, explaining that there is order in the whole which was constituted according to a hierarchy of laws (*quae constabliuntur per leges*). These laws operate in their order, some above, some below. Examples of this are laws of justice first, then laws of political order, and then laws of economics. Although these laws operate on discretely different levels, they are related by the same scheme. It is easy to extrapolate from these to the physical “laws” of nature that govern the behavior of matter and energy, again, on successive levels of subordination.⁸³

In summary, we find in *True Christian Religion* § 73:2 a simple statement that reveals the enormity of this concept of the operation of order in creation. God created the world *from* his own order, *into* his own order, we are told. He impressed upon each thing of creation its own order within this greater order. The divine omnipotence is in order, and acts according to its laws. It cannot in fact act against that order, because order, with its laws, is God himself. There are considerable implications here for the operation of the divine providence, for, among other things, the possibility of miracles as a contravention of natural laws, for the possibility of “special creation” and for divine intervention in the evolution of organic forms (some means for interventional “design”). This is no doubt what inspired Swedenborg to

82. *Ibid.*, § 54.

83. *Ibid.*, § 55.

introduce this concept of order very early in his systematic theology. As he clearly states, without it, we cannot proceed to other things.

Spiritual influx

The ascent from natural to spiritual seems a logical goal, and yet the top of the "ladder" remains elusive. Science can bring us only so far, and never, it seems, across the last divide. The problem? We must understand that spirit flows into nature in a one-way system of influx. Nature cannot flow upstream.

Once he had identified the order of the universe as a direct manifestation of the Creator, which is order itself, Swedenborg found himself with a difficult philosophical problem. This idea of order as God runs perilously close to an immanent God who, while creating nature from himself, becomes by direct extension that very nature. God creates the universe . . . is he still in it, and if so how? Is he apart from it? Is he it? These questions have enormous implications.

This problem is not new; it is the final common pathway for all theistic philosophers who consider the origin and operation of the universe. It is a simple enough problem on its face: On the one hand, if God creates something beyond himself, then all that is created is of God's substance, pure and simple. But on the other, if God were to create and then retire, allowing Creation to operate according to its own intrinsic parameters, then we can imagine a world apart in operation from its Creator, but continuing to run in some semblance of his image. What we seem to have is a mutually exclusive problem of attachment: all or none.

If God remains intrinsic to Creation, then all things of Creation are essentially God, in some expression or another. As we have seen, this is pantheism, a governing mechanism in which there is no possibility for spiritual freedom. Whether it may seem so or not to those inside the system, all events are determined, as they are derived from the willfulness of the whole. Pantheism may be extrapolated to such theological errors as determinism, predestination and ultimately even nihilism, since in ultimates, what is the purpose of living without freedom, autonomous personality and identity?

If, on the other hand God were involved with Creation's beginning, but has now in some way become detached from it, then autonomous personality becomes all; now freedom, in the absence of parameters is limitless, and can easily resort to license. Swedenborg famously states that "the origin of evil comes from the abuse of the faculties peculiar to mankind, which are called rationality and freedom."⁸⁴ Note that it is not the freedom *per se*, but its misuse; deistic detachment simply facilitates this misuse in the absence of external limits. Appearing with the tide of Enlightenment skepticism and humanism, Deism was an attractive alternative for intellectuals who, having been raised as Christians, could no longer tolerate the doctrinal constraints of their churches. Preferring theism over its antithesis, they embraced a faith of human reason and a belief in inherent human goodness. But deism is a dangerous proposition. It can lead to much more than just a detachment from God, in its own brand of nihilism, and finally frank atheism, as described by William Provine, Professor of Biological Sciences, Cornell University:

Let me summarize my views on what modern evolutionary biology tells us loud and clear. . . . There are no gods, no purposes, no goal-directed forces of any kind. There is no life after death. When I die, I am absolutely certain that I am going to be dead. That's the end for me. There is no ultimate foundation for ethics, no ultimate meaning to life, and no free will for humans, either.⁸⁵

There are many nuances of deistic philosophy, leading to many different claims. But it is difficult to support, as it seems to want to have things both ways. The inherent goodness of humans is a problem too, in the light of observed behaviors of humans of all religious and non-religious stripes. It angers atheists, who see it as a half measure, and it doesn't effectively explain the place of humans in the universe. In all, we return to the problem of freedom vs. license, the affirmative principle vs. the negative. In the absence of standards, people will eventually work their way around to "the abuse of the faculties peculiar to mankind, which are called rationality and freedom." This, in Swedenborg's theology, is a doorway into evil. At best it seems a tepid attempt at religion.

84. Swedenborg, *Divine Love and Wisdom*, § 264.

85. Provine, W.B., *Origins Research* 16(1), p.9, 1994. Accessed on February 13, 2015 at <http://creation.com/wm-provine-evolution-atheism-no-purpose>.

The historical approach by pantheists has been tacit acknowledgment of the problem, without any active effort towards resolution. Baruch Spinoza famously sparked controversy with his reference to *Deus, sive Natura* (God, or nature),⁸⁶ an ambiguous reference to his concept of a God who was not just in nature, but was in some way one with it. Although Spinoza generally gets credit for being the first modern pantheist, and his notorious belief of God as nature no doubt played a role in his excommunication from the Sephardic Jewish community of Amsterdam, his theology would today more likely lean to the side of a panentheistic universe.⁸⁷ But this concept, a refinement of pantheism in a later era, was not a philosophical option in his day.

The idea persists into the modern era. In a personal communication, Albert Einstein revealed himself to be a “follower of Spinoza” in his denial of a personal God, but with a belief nonetheless, in some divine operation.⁸⁸ He reiterated this belief in 1954, when, in another letter, he wrote, “I do not believe in a personal God and I have never denied this, but have expressed it clearly.”⁸⁹ But despite the expression of pantheism up to the present, its origins are ancient; and as all important philosophical propositions seem to be, this one comes from the Greeks.

The problem appears, essentially unaddressed, in the *pleroma* of the Greek mystery schools—a proto-Kabbalistic system of creation by levels, from prime-mover down to the Earth and all that lies between. The Jewish mystics who adapted this doctrine to their own purposes learned to live with the same fundamental inconsistency, over the centuries from its first appearance in the creation-by-emanation of *Sefer Yetzirah* (Formation) and

86. Spinoza, Baruch, *Ethics*, Part IV, Preface.

87. In pantheism, God is all; in panentheism, all is in God. Panentheism is the belief that God exists and interpenetrates every part of nature, and extends infinitely beyond as well. It is distinguished from pantheism, which sees God as synonymous with the material universe. In a pantheistic universe God is the Whole itself; but in a panentheistic system the universe and God are not ontologically equivalent—God is the eternal, animating force behind the universe, with the universe as nothing more than a manifestation of God. While pantheism asserts that God and the universe are coextensive, panentheism claims that God is greater than the universe and that the universe is contained within God. This distinction is enormously significant, preserving as it does the possibilities of spiritual freedom and individual autonomy.

88. Albert Einstein, in letter to Eduard Büsching, October 25, 1929.

89. Dukas, Helen and Hoffman, Banesh (eds), *Albert Einstein, The Human Side*, Princeton University Press, Princeton, New Jersey, 1981, p. 43.

Zohar (Splendor) to mature Lurianic theo-cosmology.⁹⁰ The system works, but God steps down to earth without any point or mode of detachment. God is Creation, and Creation God; the all is truly one. The enduring theological problem here is the place of people in this scheme, a seminal image appearing early in the biblical narrative: “. . . for God knows that in the day you eat of it, then your eyes shall be opened, and you shall be as gods, knowing good and evil.”⁹¹

This idea of divine origins with ultimate detachment was becoming popular among intellectuals in Swedenborg’s day as the quasi-religion of Deism, leading him to warn against its progress. An Enlightenment Kabbalist saw it for what it truly was: “I’ll tell you a secret,” said Rebbe Nachman of Breslov, “a great wave of atheism is coming into the world.”⁹²

As any scholar, Swedenborg was a product of his education and intellectual environment. His university curriculum grounded him in the Liberal Arts of scholasticism, based on the classical system of Aristotle, as adapted to the theology and proto-science of that day. But in response to the invitation of *Novum Organum*, Enlightenment scholars were pushing beyond this orthodoxy, towards a new and even heretical worldview that denied as much as it offered.

Intellectuals of Swedenborg’s comprehension had their own ideas about influx. His *Philosopher’s Notebook*⁹³ is witness to his broad exposure to both classical philosophers and those of his own day. He consulted them on topics ranging from the very practical (the senses, motion) to the metaphysical (the soul, God), to the philosophical (logic, syllogism, end and means). But in respect to the principle of influx, he seems to have focused primarily on the systems of Aristotle and the early modern philosophers Descartes, Wolff and Leibniz, for comparison with ideas of his own.

90. Ten in number, the *sephiroth* (emanations) are the “ten words,” spoken by *Ein Sof* to bring the world into being. The ten words combine with the twenty-two letters of the Hebrew alphabet, and in combination these produce the thirty-two paths of wisdom by means of which Creation actually proceeds. But this network of divine creation lacked any jumping-off-place between *Ein Sof* and *Keter*, the first sephirah, or between *Yesod* and *Malkhut* (Earth). From *New Kabbalah*, accessed on 8/5/14 at <http://www.newkabbalah.com/home.html>.

91. *Genesis 3:5 Holy Bible* (New King James Version).

92. Rebbe Nachman of Breslov, *Rabbi Nachman’s Wisdom* § 220, Breslov Research Institute, Lakewood, NJ, 1984.

93. Acton, Alfred, Tr. & Ed., *A Philosopher’s Notebook*, Swedenborg Scientific Association, Philadelphia, 1931, p. 193.

Wolff, in *Psychologia Rationali*, summarizes Aristotle's notion of *physical influx* as the flow of one substance into another. "Hence our organic body is said to flow physically into the soul . . . and contrariwise, the soul is said to flow physically into the body."⁹⁴ Aristotle himself explains that

. . . soul and body are mutually affected by each other. When the state of the soul is altered, this simultaneously alters the form of the body; and so when the form of the body is altered, this simultaneously alters the state of the soul. . . . It is also manifest that to the virtues of the soul correspond similar forms in the body.⁹⁵

Wolff, an exemplar of the Enlightenment, discredits this premise of physical influx, as it is "opposed to the order of nature . . . it cannot be subjected to experiment, and it is destitute of all probability."⁹⁶

Clatterbaugh identifies in Descartes an "influx model" of causation, "through the transfer of an entity (usually a property) from the cause to the effect."⁹⁷ This is a kind of "transference" that "runs into insurmountable difficulties, however, when one turns to the body-mind interactions or interactions between God and the world."^{98, 99} Considering the problem that dualism presents for a physical mind-body connection, Descartes says that "we judge that things outside the mind transmit signals to the mind that give it the occasion to form ideas by means of the faculty innate to it." Wolff explains this as

. . . the system in which the commerce between mind and body is explained by harmonious modifications immediately effected by God, or by means of the general will of God, most freely restricted by certain laws.¹⁰⁰

94. Swedenborg, *Philosopher's Notebook*, p. 193.

95. From Aristotle, *De Physiognomy*, c: iv, quoted by Swedenborg in *Philosopher's Notebook*, pp. 173–174.

96. Swedenborg, *Philosopher's Notebook*, p. 195.

97. Beebe, Helen, Hitchcock, Christopher, and Menzies, Peter, Ed., *The Oxford Handbook of Causation*, Oxford University Press, Oxford, 2009, p. 57.

98. Beebe, *Oxford Handbook of Causation*, p. 58.

99. As we shall see, Swedenborg, arguably a Cartesian, will rehabilitate this concept with his Doctrine of Correspondence.

100. From Wolff, Christian, *Dialogue 4*, §18, quoted by Swedenborg, in *Philosopher's Notebook*, p. 96.

This is a dualistic system in which created substances cannot serve as efficient causes of effects. In the absence of efficient causation, all events are considered to be caused directly by God, as the occasion arises. Since physical things in this context cannot transfer anything to the mind, this principle of *occasionalism* offered a mechanism for mind-body transference;¹⁰¹ and for a theist such as Descartes, these modifications are easily identified with the divine will.

Leibniz added a variation on this theme of divine assistance in soul-body harmony. Agreeing with Descartes that there is no causal interaction between the two, but going beyond occasionalism in the nature of divine involvement, he proposed a system in which

Each substance has an internal force or nature that causes it to play out its various states in harmony with all other substances in creation. The world so organized by a pre-established harmony looks no different from a causally interactive world, it is just that interaction is not what is going on.¹⁰²

In isolation this idea might at first seem strange and unlikely; but when seen within the context of Leibniz's complete system it is consistent with his notion of the universal intelligence of his *monads*, and the divinely holistic nature of the universe itself. In his own words,

It is one of the rules of my system of general harmony that the present is pregnant with the future, and that he who sees the whole, sees in that which is, that which is yet to be. And what is more, I have established by way of demonstration, that in each part of the universe God sees the entire whole, and this because of the perfect connection of things.

The laws of bodies (many of which are now known) and the laws of monads (many of which are still unknown), although diverse, are yet so greatly in agreement, that it is permissible to call them harmonic, and by their means, to derive harmonic effects from harmonic causes. That is to say, these laws are of such a nature that if bodies once conspire with monads and monads with bodies, each following its own laws, they can never do aught but conspire; and therefore a pre-established harmony between them is possible.

101. Beebe, *Oxford Handbook of Causation*, p. 59.

102. *Ibid.*, p. 68.

It is possible for body and soul to conspire together, even though the principle of mutation be intrinsic with each of them. Therefore it is necessary that they be harmonically established by God from the beginning and once for all, so that from their former harmony all other harmonies may follow as consequences.¹⁰³

Bilfinger, another Enlightenment philosopher with an interest in soul-body operation, offers a utilitarian assessment of Leibniz's doctrine of causality. Capturing the iconoclastic spirit of the early modern philosophers, he says,

It is not difficult to answer the question as to the use of the system of pre-established harmony. Its use is, as regards the old system, to escape from the emission and transmissions and transmutations and trans-creations of species; the conjunctive entities and intermediate vehicles between the spirit and the body; the figments of the Schoolmen and all the supplements of these figments; and as regards the Cartesian system, to guard against perpetual miracles; and legions of natural laws; and gaps of the system induced by things, laws, and statutes wholly arbitrary.¹⁰⁴

This doctrine served Leibniz's purposes very well, but was dependent on his complete system for coherence. There is a price to pay for the intellectual beauty of pre-established harmony: It is "required to give lip service to the idea that things causally interact while denying that that is the real story."¹⁰⁵

Swedenborg was looking for another way. The exclusive choices of pantheism *vs.* deism are too neatly opposed for a valid representation of the reality at work here; they make a perfect false dichotomy. The alternatives of occasional influx and pre-established harmony rely too heavily on immediate divine intervention and invite theological determinism. Attempting to break free with a valid system of his own—one that preserved the freedom essential to his purposes and that also might better square with experience—he proposed a causality driven not by divine fiat, but by spiritual-natural

103. Quoted by Swedenborg from Leibniz's *Theodicy, De Bonitate Dei*, § 360, in *Philosopher's Notebook*, p. 164–165.

104. Quoted by Swedenborg from Bilfinger, Georg Bernhard, *Harmonia Anima et Corpus*, 2nd Ed, 1727, in *Philosopher's Notebook*, p. 165.

105. Beebe, *Oxford Handbook of Causation*, p. 68.

correspondence. This was not a refinement of the systems of Descartes or Leibniz; it was a new idea of relationship by means of analogy. In his *co-established harmony* was the germ of what would become his Doctrine of Correspondence. He explains it best in *Dynamics of the Soul's Domain*, in a discussion of the degrees of the mind:

The soul, then, is an intellectual mind [*mens*] by way of eminence. Now, since the soul does not flow into the actions of its body, except by intermediates; nor by a continuous medium, but as it were by a ladder divided into steps; there can be no such thing as Occasionality of Causes and Physical Influx. For if the state proper to the soul be called a moral state, in which is found the beginning of reason, or the principle from which reason originates; and if the state proper to the intellectual mind [*mens*] be called a rational state, in which is found the beginning of affections and impulsive causes, or the principle from which these originate; and if the state proper to the external mind [*animus*] be called a physical state, in which we found affections as the impulsive causes of the actions of the body; and if the state proper to the body be called a mechanical state; it then follows that there can be no influx from the moral state into the mechanical state of the body, except by the rational state, and thence by the physical, or by two intermediates, and this also, for the most part, not by direct determination, but by a mode of concurrence or consent; by reason that the powers and faculties are distinct, whence results liberty. Consequently, there can be no such thing as Preestablished Harmony. Hence the more an inferior principle derives from a superior one, the more the inferior partakes of its state, or of the perfection of its state; for instance, either more of morality, or more of rationality, or more of solicitation from the affections as impulsive causes; thus there is a Coestablished Harmony.¹⁰⁶

So it is clear from this excerpt that for Swedenborg, his coestablished harmony superseded the causal systems of Aristotle, Descartes and Leibniz in its ability to explain the interaction of soul and body. But in a demonstration of the universality of his new doctrine, he then shows how it encompasses the three otherwise conflicting systems, and allows for their agreement:

106. Swedenborg, *Economy of the Animal Kingdom [Dynamics of the Soul's Domain]*, § 649.

From the above, it now follows that the commerce between the bodily sensations [and the soul] is not effected by any influx, still less by a physical influx, unless by influx we wish to understand natural correspondence, but then it is an influx of harmony and not an influx of the entities that form the harmony. It is this influx that seems to have been meant by the author of Occasional Causes. Natural correspondence falls in with preestablished harmony, and acquired correspondence with coestablished harmony; for natural correspondence is the result of coestablished harmony. In the soul, this harmony is preestablished, while between the soul and the intellect, and between the latter and the thought, it is coestablished. But because it preexists before the other correspondences were formed, it can also be called preestablished, that is, established prior to the harmonies that follow. In this way, the hypotheses concerning the commerce of body and soul are reconciled; to wit, the hypotheses of those who affirm occasional causes, of those who affirm physical influx, and of those who affirm preestablished harmony. For when the paths, the modes and the differences of the communication are rightly understood, the writings of the three schools are seen to be concordant. Because of this concordance, I would prefer that this commerce be said to be effected by correspondence. Thus, the hypotheses themselves also mutually correspond to each other.¹⁰⁷

In a footnote to this same passage by editor Alfred Acton, we find a useful summary of these causal systems of the other philosophers, for comparison with Swedenborg's co-established harmony.

Descartes held that the soul and body were so utterly distinct that they had nothing in common. To the soul belonged will and thought; to the body, extension. From this conception his disciples, in order to explain the commerce between soul and body, formulated the doctrine of Occasionalism or OCCASIONAL CAUSES. According to this doctrine, on the occasion when the soul wills, God makes the body act accordingly; and on the occasion when the body senses, God makes the soul perceive its sensation.

107. Swedenborg, *Rational Psychology*, § 167. This might also explain how, in § 19 of Swedenborg's *Soul-Body Interaction of 1769*, we find Descartes's occasionalism (called there Spiritual Influx) the winner from among these same three causal schemes, with no mention of co-established harmony at all.

Opposed to this was the doctrine of PHYSICAL INFLUX held by many of the Schoolmen. According to this doctrine, the world flows into the soul by the senses, and there produces sensation, perception and will.

Leibnitz, following Descartes' thought as to the utter distinction between soul and body, explained the commerce between them by the doctrine of PREESTABLISHED HARMONY, a doctrine which his disciple, Christian von Wolff, presented as a complete philosophical system. According to this doctrine, the soul and body are so distinct that there cannot be any influx of the one into the other. Each has its own laws; but between them there is such preestablished harmony that, whenever the soul desires, the body acts, and whenever the body is affected or acts, the soul at once wills; and this, not because of any causal relation between the two, but by virtue of a preestablished harmony.

See Swedenborg's work on *Influx* no. 19. For his examination of the doctrine of Preestablished Harmony, see his "Harmony between Soul and Body" in *Psychological Transactions* (Swedenborg Scientific Association, 1920).¹⁰⁸

What resulted from all of this was a fresh approach to this perennial problem, appearing first as co-established harmony, but maturing to become his own doctrine of influx, and ultimately to become correspondence. For Swedenborg influx is both general and particular. He explains that divine wisdom flows into non-human animals from the Lord through the spiritual world as instinctive knowledge or operational faculties, necessary for survival and reproduction. Humans, he says, receive a similar general influx, which he identifies with vegetative functions, unconscious drives and primitive, instinctive behaviors not so different from those of our animal counterparts. But humans are receivers of a more particular, or specific influx, and it is this that elevates humans above all other receivers of life. This "particular influx" is rationality, a divine trait available in accommodated form for human participation.¹⁰⁹ Next he explains just how this happens.

In the human being there is an "inmost", or highest level of the mind into which the divine of the Lord can flow. This is the "dwelling-place of the Lord," we are told, the spiritual entrance that sets humans distinctly apart, makes them human and imparts to them eternal (spiritual) life.¹¹⁰ This

108. Swedenborg, *Rational Psychology*, bottom of p. 99.

109. Swedenborg, *Arcana Coelestia*, § 5850.

110. Swedenborg, *Heaven and Hell*, § 39.

influx is continuous and universal, but can only be accessed by humans, as they alone possess this “inmost,” or highest level of mind.

This influx is not immediate, but comes to us through the heavens, to find a receiving vessel in the inmost of the human mind. But what about connection? In *Divine Love and Wisdom* Swedenborg addresses this problem using the pulse and respiration of the human body as examples of action-at-a-distance—connection and self-direction in one operation. The pulse and respirations *correspond*, he says, to their spiritual counterparts, divine wisdom and divine love, respectively, that are flowing in. The receiving vessels for these divine essentials are the heart and lungs, which operate autonomously on the physiological level, according to natural principles, but which do so in conjunction with the life that is flowing into them. In practical terms, what flows in at this level is the very life that animates the body, by means of the “two tents in the breast,”¹¹¹ the heart and the lungs.

So now we have influx at two levels, apparently doing two different things: influx of divine mind (rationality) into its natural receptacle, the inmost of the human mind; and influx of life, on a whole-body level, as divine love and wisdom into their receptacles, the heart and the lungs. But what about influx at the level of the discrete living units called the cells, and influx at the most basic level of all—the influx of actual existence into matter?

It is not difficult to imagine that cells, despite their incorporation into multicellular tissues, and tissues into organs, exist essentially as self-contained living entities. Though interdependent in a number of ways, each is its own little world, inside a limiting membrane, where myriad self-regulating processes operate to maintain life and function. This life too, must be maintained, and it is not difficult to visualize cells as yet another level at which influx operates on receiving vessels proper to it. Swedenborg describes this process, as “the circle of life,” in which cells (“spherules” to him, almost a hundred years before “cell theory” would explain the proper role of these living units) receive life remotely, by means of a soluble medium suited to carry it from its entry point in the cerebral glands of the cortex.

We may thus understand the course of the circulation of the animal spirits; namely, that it is from the cortex into the universal fibers, from the fibers into the blood, from the blood into the brain, and so back into the cortex. . . . This

111. Swedenborg, *Conjugial Love*, § 75.

spirituous fluid with its fiber is all in all of the whole and every part, and is the single fluid in which life proximately resides, while in the red blood, and in the essences derived from it, life resides more remotely. On this account the circulation of this fluid deserves to be called the “circle of life.”¹¹²

As is so often his method, Swedenborg describes creation in a new and dynamic way, in contrast to the static, past-tense image found in the traditional Christian interpretation of *Genesis* 1:1. For two thousand years believers have known that “In the beginning, God created the heavens and the earth.” But the Hebrew language conveying this mystical message is much more fluid than the Latin, and even the English into which it has been rendered for Christian posterity. The Hebrew is just as accurately read “In the beginning, God *began creating* the heavens and the earth.”¹¹³ This is very different. Creation is continual.

The learned know that remaining in being consists in perpetual coming into being. Nevertheless it is contrary to their affection for falsity, and consequently to their reputation for being learned, to say that natural forces are constantly kept in being, even as they came into being, from the Lord’s Divine. Now because every single thing remains in being from the Divine, that is, is constantly coming into being from Him, and every single thing from that source is inevitably a representative of the real thing by means of which it has come into being, the whole visible universe is therefore nothing else than a theater that is representative of the Lord’s kingdom. And this in turn is a theater representative of the Lord Himself.¹¹⁴

In the *Principia*, Swedenborg traces this concept all the way down to the smallest components of matter—spiritual *conatus*, or effort, continually giving rise to natural matter at its lowest level, to compound into the complexity of a universe. The principle is the same, across the spectrum, from the “first natural point,” to the “heavens and the earth.”

112. Swedenborg, *Economy of the Animal Kingdom [The Soul’s Domain]*, Vol. II, § 168.

113. “When God began creating the heavens and the earth, the earth was a shapeless, chaotic mass, with the Spirit of God brooding over the dark vapors.” *Genesis* 1:1–2, *Holy Bible* (Living Bible Translation).

“When God began to create heaven and Earth . . .” *Genesis* 1:1, *Tanakh* (Jewish Publication Society of America, 3rd Ed., 1992).

114. Swedenborg, *Arcana Coelestia*, § 3483:2.

So now we have spiritual influx in operation on four levels: influx of divine mind (rationality) into its natural receptacle, the inmost of the human mind; influx of life as divine love and wisdom into their receptacles, the heart and the lungs; influx by means of “the bloods” into cells and tissues; and influx of spirit into nature at its finest level, creating matter and subsequently the universe, in a continual process of divine expression. Do these represent four kinds of influx? No. What flows into creation is the divine, which is implicate order,¹¹⁵ manifesting itself in Creation as a reciprocal union of Divine Love (from which will come all good) and Divine Wisdom (from which will come all truth), received by natural matter as life—the principle that animates the living world. One God, flowing into not a single nexus, but three.

Now we have returned to the problem of connection: How is this world interactive with its Creator? We seem to require some connection, for the maintenance of order in a process of continual creation, but we need a certain distance as well, to allow the world and all that is within it, to operate according to its own principles. People need the freedom to choose or to reject salvation. We have found three possibilities here. Pantheism gives us only connection, in a deterministic universe in which all things are God. Deism leads us down the path of human ingenuity, to the abuse of the faculties of freedom and rationality, which, we have learned, is the origin of evil.

The third way is by means of a series of finitions along a gradient of discrete degrees of order—steps, or levels, from God above the heavens down to the non-living matter of the natural world. But isn’t this still connection? Could this be just fancy Deism? No. There is distance afforded by the steps and by formational changes as they descend, and there is still interaction, by means of *correspondence*. Once he had established a model for the influx of spirit into nature, Swedenborg then saw the necessity for both

115. “Implicate order,” a term and concept proposed by American physicist David Bohm (1917–1992), comes very close to the idea that Swedenborg was trying to convey with his more overtly theistic model of the order inherent in the universe. Walking a precarious line in the 1970s, Bohm was able to suggest an overarching consciousness binding all natural phenomena, without a spiritual reference to this consciousness. Such is academic life in a world dominated by scientific materialism. See Bohm, David, *Wholeness and the Implicate Order*, Routledge, 1980. As used by Bohm, “implicate” implies an internal order, integrated or interwoven into the fabric of the universe, in contrast to the concept of a non-implicate, or external order, imposed on nature to constrain it.

of these—the steps and the correspondence, a structural and a functional component, to complete his model of the two worlds.

The conjugal principle

There is an active and a passive element in all created things, a reciprocal dualism of complementaries in nature reflecting the actual nature of the Creator Himself—a marriage of Love and Wisdom

At every juncture in all his works, Swedenborg bombards us with complementary pairs. Nothing, it seems, when we first encounter his writings, is ever one thing. It is two things, at once. This is intriguing, and even confusing at times, until we see the universality of these incessant pairs. As we learned from his teachings on order, the Lord Himself is Love and Wisdom—inseparable, interwoven—a one from these two in operation. Swedenborg often uses the term *marriage* to describe the relationship of these elements in the Lord. From a summary of *Arcana Coelestia*, § 2,618 by Potts,¹¹⁶ we find that

. . . the state of union of the Lord’s Divine Spiritual in His Divine Celestial . . . is the marriage of good and truth, whence is the heavenly marriage, which marriage is that of the Lord’s kingdom . . . (which) is therefore so frequently called “a marriage”. . . The reason is, that from the Divine marriage of good and truth, and of Divine truth and good in the Lord, is all conjugal or marriage love, and, through this, all celestial and spiritual love.

Other such pairs found in his writings are:

Celestial	Spiritual
Charity	Faith
Will	Understanding
Good	Truth
Receptive	Active
Affection	Knowledge

116. Potts, John Faulkner, *The Swedenborg Concordance*, Swedenborg Society, London, 1976.

Forensic	Domestic
Feminine	Masculine ¹¹⁷

It is important to distinguish these complementary pairs from truly dualistic pairs, or opposites. A central theme of Gnostic systems contemporary with early Christianity expressing a fundamental dynamism between good and evil, Dualism is inconsistent with Christian and New Church cosmology. It implies a Creator possessing both these attributes, but we know that God is one, and from Him is good alone (see *Conjugal Love*, § 444, *True Christian Religion*, § 490, and *Divine Love and Wisdom*, §§ 23, 27). Pairs analogous to Divine Love and Divine Wisdom are two elements involved in a *reciprocal dualism*, a dualism of complementary, functional integration, the furthest thing from opposites. The principles at work here are 1) the complementary and even symbiotic necessity of the participation of both elements for proper integrity, and 2) the primary receptivity of the one element with respect to the active nature of the other. The two are united in operation.

The concept is not unique to Swedenborg's writings. In virtually all religious traditions, and the ancient Greek philosophy of Heraclitus and Pythagoras as well, there is the notion of a fundamental duality in the way things are arranged and expressed, from things spiritual to the most basic elements of nature. These things are not simple opposites, as might first be assumed. What is expressed by these binaries is not opposition, but complementarity. This notion even appears in the modern scientific interpretation of the nature of matter. By adding terms from these various traditions to our collection of pairs, we can soon build an impressive list of interactions.¹¹⁸

What are we to do with all these pairs of apparently unrelated things? Does each pair represent a distinctly separate species of wisdom or reality? Is each a different aspect of the universe, to be dealt with apart from all the others? Not at all. Let's lump these pairs into a single idea, and see if we can make sense of what they represent. We will find that they are all reflections of what Swedenborg called the *conjugal principle*, at work in all things.

117. We live in perilous times, when the inclusion of one of Swedenborg's most pervasive spiritual principles might be negatively construed as politically incorrect. His masculine and feminine archetypes combine as complementaries to make a whole, in a reflection of the very nature of God as a reciprocal dualism of divine love and wisdom.

118. See Appendix F: "Reciprocal Dualisms Found in Various Traditions, Suggesting the Inherent Binary Nature of the Creator"

We read first that the *conjugal* is, in the supreme sense completeness—wholeness—the Lord’s kingdom, and the Lord Himself.¹¹⁹ Here is wholeness from the combination of two things: divine good and divine truth; bridegroom and bride. Elsewhere we read:

They are said to be one distinctly, because love and wisdom are two distinct things, yet so united that love is of wisdom, and wisdom is of love, for in wisdom love is, and in love wisdom exists; and since wisdom derives its *Existere* from love, therefore Divine Wisdom also is *Esse*.¹²⁰

Since there is such a union of love and wisdom and of wisdom and love in God-man, there is one Divine Essence. For the Divine Essence is Divine Love because it is of Divine Wisdom and is Divine Wisdom, because it is of Divine Love. And since there is such a union of these, the Divine Life also is one. Life is the Divine Essence. *Divine Love and Divine Wisdom are a one because the union is reciprocal, and reciprocal union causes oneness.* (Emphasis added.)¹²¹

There is also a union of love and wisdom in every Divine work; from which it has perpetuity, yea, its everlasting duration.¹²²

The specific term Swedenborg uses to describe the association between the two elements of his pair is “reciprocal union”—not addition, or combination, or amalgamation, or interdigitation—but a reciprocating relationship. Where did he get such an idea, and how did he understand this unique relationship? To answer this question, we must travel backwards in time to Swedenborg’s earliest works; far enough in fact, to find Swedenborg the savant, not yet the seer. We will begin in 1734, when Swedenborg the natural philosopher published his *Principia*, or *First Principles of Natural Things*. A little patient exploration of some Age of Reason natural philosophy will show us the ground floor of this conjugal principle as it occurred to a man who was trying to explain how the universe worked.

It is important to start here in order to establish the primal role a reciprocal dualism would play in Swedenborg’s theology to come, and to

119. Swedenborg, *Arcana Coelestia*, § 6179.

120. Swedenborg, *Divine Love and Wisdom*, § 34.

121. Swedenborg, *Divine Love and Wisdom*, § 35.

122. Swedenborg, *Divine Love and Wisdom*, § 36.

understand the nature of the preparation he underwent in order to identify the conjugal principle when the time came to find it. Starting from this historical perspective may also help to remove the barrier which has been constructed between these two Swedenborgs—scientist and revelator. There is certainly a doorway there, and we must know which way it opens, and how to go through it. But the barrier is artificial, and serves no good purpose.

For Swedenborg, scientist or theologian, the challenge was the same: to explain the descent of spirit into nature, and to explain their interaction in practical terms. To Swedenborg the scientist this was a problem of soul and body; for the theologian the question was elevated to the level of creation and providence. But the fundamental question was the same, as he made his way from scientist to revelator. He explains this natural progression, in a short essay appended to his *Interaction of Soul and Body* of 1769. Tafel tells us that the story is based on a letter from Swedenborg to Friedrich Christoph Oetinger, German Lutheran theologian and theosopher, in answer to his query, “Why from a philosopher I was chosen to this office.”¹²³

I was once asked how from a philosopher I became a theologian; and I answered, In the same manner that fishermen were made disciples and apostles by the Lord; and that I also from early youth had been a spiritual fisherman. On hearing this the inquirer asked, “What is a spiritual fisherman?” I replied that a fisherman in the spiritual sense of the Word, signifies a man who investigates and teaches natural truths, and afterwards spiritual truths rationally.¹²⁴

The essay continues, with a systematic rationalization of his transition, and further claims that the two ostensibly disparate pursuits are in fact completely compatible. And so they are; the questions of spiritual-natural interaction are as valid for science as they are for theology, operating as they do on different levels of reality, perhaps, but focused on that same reality nonetheless.¹²⁵

The Principia is a book on physics, astronomy, and cosmology, among other things, but the opening chapter deals with something more fundamental

123. Tafel, R. L., *Documents Concerning the Life and Character of Emanuel Swedenborg, Collected, Translated and Annotated*, Swedenborg Society, London, 1975, Vol. II, pp. 256–57.

124. *The Intercourse Between the Soul and the Body*, in *Miscellaneous Theological Works*, Swedenborg Foundation, New York, 1988, § 20.

125. See this complete essay in Appendix G: “How from a philosopher I became a theologian.”

to science than these disciplines alone. It is entitled “The Means Leading to True Philosophy,” and these means are Experience, Geometry, and Reason. Twenty-five percent of the book deals with the nature of matter. Here Swedenborg presents some fascinating ideas on both the origin and the composition of matter, and these differ little from the general plan of the theo-cosmology to come. The book goes from theoretical to practical. The practical portion (on magnetism, astronomy, the starry heavens, our solar system, and the nature of air, fire, and water) describes how the theoretical portion (matter) behaves. It is historically fascinating for its quaint science, perhaps naive by our arrogant modern standards, but of interest for its radically prescient definition of the internal structure of matter. What Swedenborg presents, in impressive detail, is a subatomic world quite compatible with the quantum model in place today.

It is in Swedenborg’s description of matter—from its most minute manifestation to his description of the atom—that we will find our scientist little different from our theologian. To this man, first principles were not scientific or theological things. They were simply explanations of how the universe works. He did not divide his mind, or the work that it did.

The first (smallest possible) division of matter is a point—not the theoretical entity of geometry,¹²⁶ but a smallest manifestation of something very real, but unobservable as it is not yet in space; it lacks only movement to manifest itself in nature. We define it by thinking backwards. It enters our natural world with motion provided by “the will of God,” as a nudge, or *conatus*, which gives it an internal striving toward the perfect motion of a circle, around an axis. The linear motion of this first natural point through space by geometrical necessity inscribes a spiral figure. Called by Swedenborg a *simple*, this is soon to be compounded with other simples into the next higher order of complexity, to appear as *first finites*.

126. In describing the “first natural point,” Swedenborg initially equates it with “the Point of Zeno” in *Principia*, § 7 of Chapter II. This would lead us to believe that he is seeing all of creation arising from a theoretical, mathematical construct, a grievous non-sequitur for a philosopher of his caliber. On deeper consideration, however, he explains that the point in his model is something prior to the well-known point of Zeno of Elea, with active and passive capacities more in keeping with the dynamic point of the pre-Socratic Zeno of Citium. With this clarification in mind, we find Swedenborg’s first natural point to be a philosophically defensible proposition. (See a detailed discussion of this problem in Chapter 4 of Newton, Norman, *The Listening Threads*, Swedenborg Scientific Association, Bryn Athyn, Pennsylvania, 2000.)

This finite originated from the motion of the points among themselves. As nothing previously existed but a point and a simple, it necessarily follows that what immediately succeeds originates from what precedes. By the accession of motion not only may such an aggregate receive its own proper and certain limits, but its own proper and certain space, and its own proper and certain figure.¹²⁷

Spiral motion is reciprocal (from center to circumference and back again, in an alternating motion); a movement of points in and out in orderly fashion, through loci to define the movement of the points and prevent randomness of motion. These communications and reciprocations are obtained by means of poles; motion passes from one pole to another and thus points pass and re-pass by continuous circles, in motion as perpetual spirals. It is this combined motion which causes the poles to describe a regular geometric arrangement, with subdivisions of meridians, ecliptics, circles of latitude, and an equator.

Thus also begins the same order in the microcosm which we see in the macrocosm, and thus almost the same takes place in the smallest figure as in the largest, or in that of the world . . . All these relations originate from the spiral motion.¹²⁸

We are making progress, but this first finite is not matter. It is sub-matter, of sorts—not yet the building unit we call the atom, because,

Our world as yet is lying in embryo. Nothing which can be called elementary [atomic] has hitherto received birth; no active as yet exists, which, when joined with any finite or passive, produces the essence of any element. The world, which as yet lies in embryo, consists solely of the least possible finites.¹²⁹

These *first finites* will compound again, into aggregates of combined motion, to produce still another member in the series, the *second finite*. It is here that we find the seeds of our universe, because these finites are not identical, as were the ones before and the ones before, and the ones before. They differ, each dependent on the circumstances of its origin for its identity;

127. Swedenborg, Emanuel, *The Principia*, Swedenborg Society, London, 1912.

128. *Ibid.*, p. 95.

129. *Ibid.*, p. 95.

one remaining a second finite, but the other becoming an *active of the first finite*, with the power of creation in it.

Although the second finite and the active proceed as twins from the same parent, still each is of a contrary character. The one is, as it were, quite opposed to the other. The one is most highly active, the other is most highly passive; so that they cannot mutually consort and associate with each other in the same place.¹³⁰

As we shall see, an element (atom) is born when these second actives of different types become associated, or “ultimately come into concord.” It is the nature of this ultimate concord that will define matter in the same terms as the conjugal principle.

Finally we come to the end of our stepwise construction of matter. The next order of complexity is the *elementary particle*; the atom, from which matter is built up in aggregations of compounds, molecules, and the structures familiar to our world. It is this which becomes intensely interesting in the light of our topic. Simply stated, these two prior particles, the *second finite* and the *active of the first finite*, are united in a single interactive arrangement which can then truly be called matter. But as we might expect, Swedenborg does not rest with this thought. He immediately sees infinity here:

The active always acts and impels. The passive is always acted upon and resists. One is most perfectly mobile; the other in its place, in regard to local motion, is inert . . . For one cannot as yet be in the same place or space as the other; one flies away, as it were, while the other pursues. Consequently they cannot be in the same world, unless they are so separate that the passives may occupy their place and the actives theirs.¹³¹

In this elementary particle, all that had preexisted is latent, such as the point, the first finite, the second finite, and the active of the first finite. We have thus in a microcosm the whole of our macrocosm; we have the entire world, so far as it has developed itself, in each particle, in which, therefore, we may contemplate a compendium of the whole world-system . . . Thus does this first elementary particle, consisting of the active of the first finite and also the second finite,

130. *Ibid.*, p. 152.

131. *Ibid.*, p. 156.

comprise within itself all that as yet is active and passive in the world. *Thus we have the world concentrated in a single particle.*¹³²

This is poetry! Having finally defined the elementary particle, or what we call an atom, as the reciprocal union of complementary active and passive entities, Swedenborg immediately sees its cosmic implications, and we are left to wonder if we are reading Swedenborg the scientist, Swedenborg the mystic . . . or might we be reading Blake, instead?

To see a World in a Grain of Sand
and a Heaven in a Wild Flower
Hold Infinity in the palm of your hand
and Eternity in an hour.¹³³

At this point we are beginning to see our elusive conjugal principle in one respect as a reciprocal dualism, lying at the very core of the existence of our universe. The seeds of creation are in this form. It has brought forth the world, so to speak, and, as we have already seen, by extension, this conjugal is the Lord Himself.

The conjugal principle, then, is a “marriage” or a relationship (defined here as a reciprocal dualism) to which, on some level, everything in the universe corresponds, be it animal (*Arcana Coelestia*, § 2,727), vegetable (*Divine Love and Wisdom*, § 61), or mineral (*Divine Love and Wisdom*, § 61). All things of the world are built on this principle, in corresponding harmony with the mystical union of Divine Love and Divine Wisdom which is the Lord Himself. It takes little imagination to see how this concept might play a major role in any scientific model of morphogenesis.

Form follows function

If spirit flows into nature in a directional system of end, cause, and effect, and if spiritual and natural things are related by function, then natural things may be dependent on spiritual function not only for their forms, but for their very existence as well.

132. *Ibid.*, p. 188 (emphasis added).

133. Blake, William, *Auguries of Innocence*, in Ostriker, Alicia, Ed., *William Blake, the Complete Poems*, Viking Penguin Inc., New York, 1977.

In a few important statements from various parts of his works, Swedenborg makes the case for another powerful principle for the natural sciences, and for the life sciences in particular. He does not name it, and he does not introduce it in any formal way. The idea that all of Creation is a collection of forms runs through his scientific works from the *Principia* forward. Forms are not just shapes, or accidents of nature to Swedenborg. They are natural phenomena called into being by a spiritual cause, and held in existence by that cause, to serve a specific purpose in the universe.

This is a useful concept in several respects, as it gives us a template by which we can explain and even predict how forms originate in nature—a problem long debated among biologists. It provides a concept for better understanding morphology and anatomy, and sheds welcome light on the mechanism of organic evolution. For evolution is the coming-into-being of new forms. By looking at form's special relationship with function we can know things about evolution that we have not known before.

All of Creation is a collection of forms. To comprehend this, we must define some terms. "Form" in this context is a philosophical term quite apart from the simple shape of a thing. It is a useful, technical term that has to do with a collective relational scheme; form is how parts are related to other parts. In his theological works, Swedenborg refers time and again to the "human form," and by this he does not refer to anatomy at all, but to a collection of all the attributes that, taken together, constitute a human. There is no single person who can claim to be all these things but one, the divine man, who is perfection¹³⁴ itself. His description of the *maximus homo*, variously translated as "Grand Man" or "Universal Human" is an image of all Creation, spiritual world and natural, proceeding from God as the human form divine. Swedenborg goes so far as to say that

The soul is the inmost of a person, and thence according to the ancients it is in the whole and in every part of the body, because the beginning of life resides in the soul; that part of the body in which the soul does not inmostly reside, does not live. Wherefore there is a reciprocal union; and hence the body acts from the soul, but not the soul through the body. Whatever proceeds from God

134. "Perfection" too is a technical term meaning complete or whole. A perfect thing is a complete thing.

partakes of the human form, because God is Himself Human; this is especially the case with the soul, which is the beginning of person.¹³⁵

It should be known that all things which proceed from the Sun of the spiritual world, in the midst of which is Jehovah God, declare humanity, and consequently that all things in that world have a tendency towards the human form and exhibit it in their inmost parts.¹³⁶

Thus is this human form central to humanity, created in the divine image.

What is the human form in its highest expression? *Esse*¹³⁷ is Swedenborg's term for God above Creation, above the heavens, and above all comprehension. God simply is, and that is all we can say; but it is a logical assumption that if all Creation flows from *Esse*, then this must be the most perfect thing of all. What can we say about *Esse's* form? It is perfect (complete) and it is human.

What of *maximus homo*, that heaven in human form, in a world without space or time, and therefore without extension? Heaven is a representation of all human attributes, manifested as the various uses the people there¹³⁸ perform, projected into all things of the spiritual world. The heavens strive for the perfection of the Creator in partaking of its human form. In the natural world it is the same, but subject to the limitations placed on matter by time and space and extension. It is here that form also collapses into shape, and it is shape that is of interest to biologists. According to Swedenborg's model, natural shapes must answer to the necessities of spiritual form.

But if human form is human, what about all the other forms in nature? Is human form manifested only in human beings? This is where things get interesting: Since we have established that "form" refers primarily to some relational scheme of parts with parts, and shape is only of secondary consideration, it is easy to demonstrate how all things of the universe—

135. Swedenborg, Emanuel, *Invitation to the New Church*, (1771), in *Posthumous Theological Works of Emanuel Swedenborg*, Swedenborg Foundation, New York, 1914, § 48.

136. Swedenborg, *The True Christian Religion* § 66.

137. The present infinitive of the Latin verb, *to be*, from the Hebrew הָיָה *hayah*, rendered in English as *I am* in *Exodus* 3:14, where Jehovah reveals himself to Moses at the burning bush.

138. A basic feature of Swedenborg's spiritual cosmology is that the heavens are populated by angels, who are simply people who lived out their lives in the natural world. There are no especially created creatures or other entities there, and every person is born to enter into this spiritual state after the death of the body. See Swedenborg's *Heaven and Hell* (1758), for a complete description of heaven, hell and the world of spirits.

animal, plant and mineral—“partake of the human form.” All natural forms, from the structure of the universe to the internal structure of an atom, follow the same laws, are subject to the same limitations of space, time and extension, and are therefore homologous in their structural organization.

Swedenborg’s claim that “whatever proceeds from God partakes of the human form, because God is Himself Human,” is not a rhetorical statement. He means this literally, and the implications of this statement are enormous. Understanding this simple fact transforms the world’s appearance in every way, and again, we have a powerful analytic and predictive tool for doing theistic science. All animals, plants and mineral forms strive toward the human form, “to the best of their abilities,” which is to say, that their structure, micro- and macroscopic, reflects the same parameters of physical interaction. Atomic structure dictates molecular structure, and this in turn dictates the limits of form for larger structures. And since atoms are a part of Creation, we can imagine a model in which human form is imposed on all things, from the bottom up. Considering that the “bottom” in this case is *Principia’s* spiritual-natural “first natural point,” it is possible to see how divine human form might enter into Creation. What is missing is the mechanism to allow this passage between the two worlds.

In this model, a physical relational scheme delimited primarily by subdivision according to discontinuous levels of organization (Swedenborg’s “discrete degrees” discussed in the next section) becomes the “default setting” for natural forms. The more complex the entity, the more perfect its manifestation of human form. These forms are the algebraic sum of starting materials and the physical limitations on the behavior of matter. We can state with some degree of confidence that what results from this interaction is a natural entity with some spiritual cause and connection. But what makes these forms meaningful? How do they relate to other forms, within the context of an ordered universe? To answer this question we must look to the “function” side of the “form follows function” axiom, because function apparently comes first.

In *Divine Love and Wisdom*, § 46, Swedenborg says this about form and function:

Nature is regarded in its series and order from uses, and not from some of its forms which are objects of the eye alone. For uses are from life alone, and

their series and order from wisdom and love, while *forms are containants of uses*. Consequently, if forms alone are regarded, nothing of life, still less of love and wisdom, and thus nothing of God can be seen in nature. (Emphasis added.)¹³⁹

So forms contain the uses that inspire them. If the uses are spiritual in nature (which Swedenborg certainly implies), then this suggests that creation proceeds in a specific direction, from use to form. The implications for this are enormous for the natural sciences: the form contains (receives, embodies) the use, and the use comes first—the form is dependent upon it. For a natural use, this is a given, but for a spiritual use, this is significant, because it implies that the form will disappear if the use is removed. The larger implication here is stated in *Divine Love and Wisdom*, § 171:

Creation advances to this ultimate end continually by means of the aforesaid three ingredients, which are end, cause and effect, because the same three exist in the Lord the Creator; and the Divine is present through all space independently of space, and in the greatest and least of things is the same. . . . For the Lord the Creator *continually raises up from the earth forms of uses in succession*, culminating in the human being, who in respect to his body is from the same origin. (Emphasis added.)

Creation is not only directional—spiritual to natural—but is continual as well. This knowledge helps make sense of the things we observe in nature, and both of these concepts are good tools for doing theistic science.

How is creation continual? Uses are continually coming-into-being—“raised up” by the Creator, and sent into the natural world. And forms *may* rise up to receive this influx, and in so doing, new natural forms appear in the world.¹⁴⁰ Natural forms clothe spiritual uses. The one contains the other.

There are important implications for the natural sciences here, from the formation of the solar system¹⁴¹ down to the mineral structure of the

139. Swedenborg’s term for function here is “use,” a closely related concept, but one that is more descriptive of the divine agenda present in nature. A particular form doesn’t just *work*, it *belongs*.

140. This is the origin of the power of living systems to generate new forms (from the natural phenomena of mutation, chromosomal change, etc.) in a (seemingly) random way—a theistic mechanism for evolution that has not yet been proposed.

141. See the *Principia*, Part III, Ch. 1, “On the Diversities of Worlds.” Here we find worlds rising “in successive order,” driven by “changes and contingents” (mutations), and the same with the mineral, vegetable, and animal kingdoms, each derived from the one

earth: both are human in form. The living world is driven by the powerful and relentless process of evolution, by means of this continual raising up of forms by (ostensibly) random nature; if one of these forms were to encounter a preexisting use, it might persist as a new species. Biological diversity¹⁴² is the natural world analog of spiritual perfection, in striving ever closer to the infinite of the divine in Creation. In this context, “use” translates to “niche,” and as long as an ecological niche persists in nature, the form can persist. Destroy the niche,¹⁴³ and a species will become extinct.

“Form follows function,” as understood according to these Swedenborgian concepts, is at work in morphology, anatomy, molecular biology and biological design. The better we understand how natural substance responds to spiritual influx (the limits imposed on natural forms by the properties of biological materials), the better we will understand, interpret and predict the appearance and maintenance of natural forms. This is evidence for the pragmatic role of spiritual principles in science. There will always be those who discredit such ideas because they are not derived solely from objective, materialistic methodology. Swedenborg encountered them as practitioners of materialistic Enlightenment scholarship, and warned us of their nascent naturalism. In a discussion of Swedenborg’s cosmology as presented in his *Principia*, Norman Newton comments on this lack of objectivity with modern scientists. Noting that despite the fact that Swedenborg’s system constituted a “mirror image” of twentieth century cosmology in many respects, he points out that

Such an inversion is due to the very great philosophical differences between Swedenborg’s approach, which is based firmly on the belief that God created the universe, and the modern one, which claims to be theoretically neutral but implicitly and often explicitly rejects any such belief.¹⁴⁴

below, in succession. In Part III Ch. 12, we find that these same principles governed the formation of the earth, from a series of “innumerable changes.”

142. The health of an ecosystem is measured in terms of its *biological diversity*. An environment that can support an abundance of species in balanced interdependence is evidence that there is a similar abundance of niches available there for exploitation. Natural *diversity* is equivalent to spiritual *variety*, which Swedenborg equates with perfection in *Heaven and Hell*, § 56.

143. Habitat destruction, by development, clear-cutting, pollution or other human activity, is the prime cause of world-wide extinctions in the twenty-first century. As niches disappear, the species that fill them also vanish.

144. Newton, Norman, *The Listening Threads*, pp. 179–180.

There is a lot to say about these few principles on which rest such powerful insights into natural processes. To summarize:

1. Form follows function, in a specific function-to-form direction.
2. Function (called by Swedenborg “use”) flows in from the spiritual world in a continuous process, with an infinite variety of uses flowing into nature at all times. How can this be infinite? Consider the source.
3. Nature, working by means of its “laws,” and driven by energy from the sun, is gradually raising up natural forms of increasing complexity, in a way that seems completely random and not at all self-directed.
4. When a form is of such a structure that it can properly receive (interact with, resonate with, or correspond to) this influx, a connection occurs, form and function begin to reciprocate, and a new species (a new kind of organism) appears in the natural world. This new form will persist until the connection is severed. There are considerable ecological implications to this principle.

There are the makings here for a comprehensive reexamination of the biological processes that bring about new forms. But there is still some missing information before we proceed. Swedenborg knew this, as he rounded the corner on his quest for a practical explanation for spiritual-natural interaction. What are still to come are the core principles that describe or explain the nature of this *connection*, and how it is established. And this returns us to the perennial problem of connection and freedom from it, still unsolved.

The doctrine of series and degrees

All created things are organized and related according to degrees of order, in a structural scheme common to all created things: homologous forms in two modes of discontinuous degrees of order that branch, or bridge, and continuous degrees that carry qualities according to increasing or diminishing proportion.

Swedenborg's Doctrine of Series and Degrees is a statement, from observation, of the relational scheme connecting all things of Creation. It was briefly discussed in an earlier section, in the way of a historical and general introduction,¹⁴⁵ where this statement appears:

This concept of discrete and continuous degrees of order is immediately the most pervasive of Swedenborg's doctrines, explaining as it does the operations of nature on virtually every level, and by necessity attempting ultimately to explain the operation of the divine in nature as well.

What follows is a more complete discussion of this powerful idea.

The Doctrine of Series and Degrees is likely the most universally known of Swedenborg's doctrines, not only to students and scholars, but to the faithful of the Church of the New Jerusalem as well. This is possibly because of all his spiritual principles, this one is so plainly understandable. And once understood, its universal application—for science and for theology—is immediately apparent. It is a powerful, useful and universal principle of divine order at work in Creation.

Originating from necessity in his earliest scientific works, this concept is useful to Swedenborg in all that he does; his philosophical program is based on it, and his visionary theology is plausible because of it.

In Chapter one of the *Principia* (1734) Swedenborg the mechanical engineer states that nature operates as a motive force, i.e., it is a collection of things in motion. Thus the operation of nature is going to be mechanical in function, with forces impinging on other forces in a universe of dynamic action. "No reason," he says, "can be assigned for any phenomenon, unless we admit the existence of contiguity or connexion; for no phenomenon can exist except in something contiguous."¹⁴⁶ As he sees it, the key is *contiguity* of parts: one particle operates on another and also by means of another, in the context of continuous motion. In such a system there is a linkage of parts, as the cars in a train are linked together and related by means of

145. II. "Emanuel Swedenborg's Theistic Science in an Age of Reason; Swedenborg the Scientist," p. 6.

146. Swedenborg, *Divine Love and Wisdom*, § 36. *The Principia*, Chapter 1, p. 23. It is of note that Swedenborg's use of the word and concept "contiguum" is being introduced here in the *Principia*, to become another of his major ideas. The contiguum concept was also discussed briefly in Chapter II. The term "contiguum" appears first in *The Infinite and the Final Cause of Creation*, published in 1734, the same year as the *Principia*.

the their generalized motion. Without continuous connection by means of motion and contiguity nature, he says, could not exist.

For nothing can originate from itself; it must originate from some other thing; hence there must be a certain contiguity and connexion in the existence of natural things; that is, all things, in regard to their existence, must follow each other in successive order.¹⁴⁷ Thus all things in the world owe their existence to their mutual dependence on each other, there being a connexion, by mediums, from ultimate to ultimate, whence all things have respect to their first source from which they derive their existence.¹⁴⁸

As he so often does, Swedenborg then provides real-world examples of this principle from the vegetable and animal kingdoms:

We see in vegetables that there is a connexion between the root and the extremities, and every part of the extremities: that there is a connexion between the intermediate stem and the little twigs and leaves. . . .¹⁴⁹

The case is the same in animals; parts cover over parts, and grow by contiguity. Both the nervous and membranous system is coherent and contiguous. . . .¹⁵⁰ Hence it is manifest that there is a continual connexion of the whole body with its minutest parts.¹⁵¹

The conclusion therefore is, that the mechanical world has its consistence in contiguity and connexion.¹⁵²

147. With the introduction of this idea of “successive order” we see the beginning of what will become a relational “law” or doctrine of degrees.

148. Swedenborg, *Divine Love and Wisdom*, § 36; *The Principia*, Chapter 1, p. 20.

149. *Ibid.*, p. 21.

150. *Ibid.*, p. 21. See *Divine Love and Wisdom* § 194—the eloquent penultimate paragraph of a lengthy and detailed treatment of this concept, now formally the doctrine of series and degrees, serving here as the basis for a theological argument for the same kinds of things, only of a spiritual nature.

151. *Ibid.*, p. 22.

152. *Ibid.*, p. 23. Note that so highly does he regard this notion of nature consisting of contiguous particles impinging on one another in motion, that here he uses the term “mechanical world” synonymously with “natural world.” (*Ergo mundus mechanicus consistit in contiguo & nexu*, p. 13 in *Principia*, 1st edition, 1734.)

The contiguum concept, seminal to the doctrine of series and degrees, is further refined in *The Fibre*,¹⁵³ of the *Dynamics of the Soul's Domain* series, dealing with elements of the nervous system. Here we find that,

. . . between the arteries and the fibers there is a difference of velocity and perfection, or of moments and degrees For there is such a co-established harmony of all things in the same series, that they mutually correspond to each other, with a difference merely of perfection according to degrees.¹⁵⁴

This is followed by a detailed description of simple substances being prior, compounded substances posterior, and the most compounded substances more posterior in a series, producing a conceptual image very much like the arrangement of elements in the periodic table of elements, which are also arranged in order, according to their complexity. Lots of philosophical terminology follows this, in a careful definition of this concept of contiguum.

By *The Dynamics of the Soul's Domain*¹⁵⁵ Swedenborg has named his contiguum concept the doctrine of series and degrees, a major, formal principle of his philosophical system.

His definitions of this concept, in paragraphs 580–587, are precise and complete. He starts with the idea of order and “rules of order”:

By the doctrine of series and degrees we mean that doctrine which teaches the mode observed by nature in the subordination and coordination of things, and which in acting she has prescribed for herself. This doctrine constitutes a

153. Swedenborg, Emanuel, *The Fibre*, (1741–42) Swedenborg Scientific Association, Philadelphia, 1918. This is a continuation of the *Dynamics of the Soul's Domain* series, and describes the medullary substance of the brain and spinal cord, and the peripheral nerves. The functional relationship between nerves and blood vessels is explored, and it is here that Swedenborg presents his doctrine of forms.

154. Swedenborg, Emanuel, *The Fibre*, § 160. Note well the use of the word and concept “correspondence” imbedded in this discussion: In his scientific works, Swedenborg was developing a useful idea of correspondence between elements as a means of defining their relationship. This has not yet matured into his major doctrine of correspondence between elements of the two worlds, but it is here in germ.

155. Swedenborg, Emanuel, *Dynamics of the Soul's Domain* (1740), Swedenborg Scientific Association, Bryn Athyn, PA, 1955 (was *Economy of the Animal Kingdom*). A major work on human anatomy in four parts, in which emerges an extensive model of a dynamic contiguum of adjacent membranous and fibrous parts, uniting all elements of the body in a universal system of functional integration. This system is introduced as the doctrine of series and degrees.

principal part of the natural sciences; for everywhere in nature there is order, and everywhere the rules of order. It is a doctrine which expounds the nature of the veriest form itself; without which nothing which is predicable of anything can occur.¹⁵⁶

He then explains what the doctrine can do for us:

Consequently the doctrine of series and degrees ought to teach, not only in what manner things are successively subordinated and coordinated, and in what manner they coexist simultaneously in subordination and coordination, but also, in what manner they are successively and simultaneously determined according to the order thus impressed, that they may produce actions, in which may be causes, between which actions and causes there may be a connection, so that a judgment may be formed respecting causes from the order in which they exist.¹⁵⁷

His language is animated. He has discovered a powerful principle of nature, that explains (and can predict) the structure of everything. In §§ 582–583 he explains that there are two kinds of degrees at work in this principle:

With philosophers, degrees are quantities of qualities; as degrees of heat, of gravity, of colors, and of many other things; thus they constitute relations. But degrees are properly progressions and determinate steps; thus, for instance, in the case of ourselves, when we walk forward, we measure out with our feet determinate distances and not only so, but in climbing a ladder, the very ladder itself has its separate steps or gradations.¹⁵⁸

“Quantities of qualities” such as degrees of heat become “simultaneous” or “continuous” degrees. “Determinate steps,” as on a ladder are gradations that become “successive” or “discrete” degrees.

In an example of cosmic proportions, Swedenborg divides the whole universe into its several series of parts in relationship.

156. Swedenborg, *Economy of the Animal Kingdom* [*Dynamics of the Soul's Domain*], § 581.

157. *Ibid.*, § 581.

158. *Ibid.*, § 583.

In the mundane system there are several series, both universal, and less universal. These series, the instant they are determined, or viewed as determinate, are usually arranged into genera and species, whence arise superior and inferior genera, and in like manner species, which acknowledge degrees of universality . . . The most universal series is the universe, or the system of the world, which contains within itself several series . . .

The series which the world comprises, are three superior, and three inferior. The superior series are those of the circumambient universe or world; the inferior are those of the earth. Of the circumambient universe or world, there is a series of substances simply derived from the first substance by the order of succession. The second series is that which the same substances constitute when left to themselves and their own nature, or when endowed with the liberty of gyrating, whence comes fire, both solar and inferior elementary fire. (n. 84.) The third series is that of the auras of the mundane system, arising from the combination of the two former, thus from their active and as it were passive principles . . .

The general series of the earth, which in relation to the former ought to be denominated inferior, are themselves also three, and are commonly called kingdoms; namely, the mineral, vegetable, and animal kingdoms. The mineral kingdom contains several species; as metals, stones, salts, earths, liquids, in short, numerous inactive substances. The vegetable kingdom contains also various species, one under the other, such as trees, herbs, flowers, shrubs, and pulse [legumes]. In like manner the animal kingdom contains its several species, which it would be tedious to enumerate. These kingdoms, or general terrestrial series, succeed each other in time and in order.¹⁵⁹

He then does the same thing with the human body, breaking it down into its many systems and parts.

Every individual animal is a series of several other series that are essential and proper to the general one. Its essential and proper series are the viscera; of which the higher series are the cerebrum, cerebellum, medulla oblongata, and spinalis; the lower, or those of the body, are the lungs, stomach, liver, pancreas, spleen,

159. *Ibid.*, § 584.

womb, kidneys and several others: for these, taken together, are constituent of the form. Each of these series contains other subject series which are essential and proper to it. The latter may be called partial series, and the former integral, or the former single and the latter common, all belonging to the whole series. Thus the liver, which is a large gland, includes in it a conglomeration of several glands, as do these again a conglomeration of their own most minute glands.¹⁶⁰

Finally coming to the most important part of this exhaustive discussion, Swedenborg tells us why this doctrine is so important, so useful and so powerful.

Consequently, the science of natural things depends on a distinct notion of series and degrees, and of their subordination and coordination. The better a person knows how to arrange into order things which are to be determined into action, so that there may exist a series of effects flowing from their genuine causes, the more perfect is his genius.

After all this detailed discussion, the use of the doctrine is short and sweet: It allows us to understand our universe and all the things in it better. Now we can “read” the things we see in nature, and rather than making random guesses, we can let nature guide us to understanding. The power in a scientific model is its predictability and the confidence it allows us in making new discoveries. Swedenborg’s doctrine of series and degrees is an analytic tool that does these things.

The doctrine of forms

Spiritual influx is translated into nature by means of a succession of intermediate forms, each of which is an accommodation to a particular level of spiritual-natural reality.

The doctrine of series and degrees, Swedenborg’s conception of nature at work within a hierarchical, three-dimensional structural matrix, transformed his search for the soul. By 1740, in the *Dynamics of the Soul’s Domain*, he had formally named this powerful structural principle, and demonstrated its

160. Ibid., § 587.

utility in his anatomical works. It explained the branching structure of nerves, vessels, and their coverings. It described the body's organization in terms of a coherent, hierarchical whole, with successive divisions of complexity, and it explained the body's marvelous ability for nearly instantaneous communication among its parts. But as powerful as it was, it explained relationships only among levels of organization within the natural plane. It could describe, but not explain a functional relationship of spiritual things to natural. His powerful doctrine of series and degrees called forth another set of principles to solve the problem of the nexus—the place where soul and body meet.¹⁶¹ This would emerge as his doctrine of forms, which appears as a freestanding section (§§ 261–273), appended to Chapter XVI of *The Fibre*, an unpublished addition to the *Dynamics of the Soul's Domain* series, written in 1742. Like many of his scientific works, *The Fibre* was prepared for the publisher but never seen through the press, an ostensible waste of effort from our nearsighted perspective. But these unpublished works served their purpose by moving his agenda along at an ever quickening pace. For he was beginning to feel the stirring of another call that would put an end to his scientific studies, and put his discoveries to a higher use.

This perennial problem of spiritual-natural connection was discussed in Section II, in a treatment of action-at-a-distance. There we found that the difficulty lay in identifying “the definitive step across which spirit is no longer spirit, and nature becomes wholly inert.” This has historically been one of the most difficult theological questions, and as mentioned previously, for this reason, some philosophers and theologians have tended to deal with the problem by avoiding it altogether. Not surprisingly, Swedenborg's solution is rigorous, and involves reasoning in concepts for which there was no technical language available. For this reason, his descriptions can seem tedious and quaint, and might be dismissed by the casual reader as fanciful speculation. Yet, if we are willing to read these descriptions very closely and even literally, and to interpret them as the general, and not specific propositions that they are; and if we keep in mind that each

161. For Swedenborg the problem of soul-body interaction was simply a microscopic version of the mechanism of spirit into nature. To him, these would have been identical, and for his purposes, souls and bodies were a much more convenient subject for his scientific studies. Very expounds on this equivalence of the very large and very small found in Swedenborg's scientific works—the same principles at work for each. See Very, Frank W., “Swedenborg's Doctrine of a Similarity Between the Greatest Things and Least,” Chapter V, p. 147, in Part I of *An Epitome of Swedenborg's Science*, the Four Seas Press., Boston, 1927.

of his propositions is based on a logical progression of well reasoned propositions that come before, then what we find in the doctrine of forms is an astonishing summary of the things scientists see today, and describe in quantum terminology.¹⁶² We find it to be an intellectually defensible solution to a very important problem.

The doctrine of forms is perhaps the least known of Swedenborg's doctrines, likely because it is the most difficult of his models to comprehend. People who know, know it is there, but few understand the purpose it serves in completing Swedenborg's agenda. This is partly because of its placement in an unpublished scientific work, and also its abrupt interpolation into a lengthy discussion of something seemingly unrelated.¹⁶³

The Doctrine of Forms provides the essential link between the powerful structural concept of discrete and continuous degrees, and the final functional mechanism for spiritual cause and natural effect Swedenborg would call his doctrine of correspondence. Without a clear understanding of how the Infinite is delimited and accommodated to allow interaction with the natural world, then any talk of purpose at work within this interaction is a baseless claim. In order to put his finished product into the hands of scientists, who will not settle for ideas that cannot stand up to objective and intellectual scrutiny, this product must be able to address all anticipated objections. It must be complete, it must be intellectually defensible, and it must be compelling in order to get a second look. The doctrine of forms was the lynchpin in this respect, for his whole research program.

As Swedenborg finally discovered, there was no single, definitive step from spiritual to natural; what he found instead was a ladder of sorts, of related forms, to accommodate creation as it stepped down, from *Esse* above

162. A comprehensive treatment of Swedenborg's Doctrine of Forms in the context of his complete scientific program may be found in Sylvia, Edward F., *Proving God*, Staircase Press, Troy, Illinois, 2009. Here you will find a rationale for interpreting Swedenborg's eighteenth century scientific ideas as consistent with the twenty-first century's quantum paradigm.

163. A summary of Swedenborg's Doctrine of Forms appears abruptly in a chapter dealing with a primary histological structure he calls the "simple fiber." After thirty-two pages dealing with Forms, he writes, "Let us now return to our fiber." It is of interest that the positioning of the section comes just before he describes this fiber as "celestial in nature." As the description of the simple fiber's properties unfolds, we will need a "doctrine of forms" to fully understand its structure and function, and its relationship with other fibers that follow in his description. Considering that this book is a draft, the unannounced insertion of the Forms section becomes more understandable. But it is obvious how this presents an obstacle to scholarship in Swedenborg's scientific works.

the heavens to the solid earth below. In language reminiscent of the successive configurations of matter in the *Principia*, he now returns to a similar model of transitional forms. These intermediates are six in number in addition to the divine form, making seven levels in all. Each is an accommodation of the Divine to a particular level of complexity. The ancient idea of the Great Chain of Being,¹⁶⁴ an ostensible “ladder of nature,” from simple to complex, is no doubt at work here, as Swedenborg was a thoroughgoing product of Enlightenment education. But as was his habit, he often makes a concept his own by adapting it to the necessities of his agenda. In this case, his succession of forms is no simple “ladder,” on which are arranged the various species of mineral, vegetable and animal, according to the order of their complexity.¹⁶⁵ Swedenborg’s doctrine of forms will get us from the “celestial” at the top to the “angular” at the bottom, of a series of transformations below the level of the visible world, where matter is coming into being.

These forms are not fixed; they are fluctuant and dynamic. In his “ladder,” forms interact with other forms. They are continually coming into being, and exhibit a certain immediacy because of it, that is open to change from necessity. But just as the Greeks understood it to be, this ladder is hierarchical too, because that is how the order flows in.

It is important to reiterate that the use of the term “form” in this context bears no direct reference to a thing’s shape. A definitive statement of this concept by Woofenden helps to establish this principle:

FORM: Used in its philosophic sense of organization, for an organic receptacle in which an essence appears. It does not relate to shape but to order, disposition, arrangement, and relation to the parts of an entity. Closely allied to function or use.¹⁶⁶

164. Lovejoy, Arthur O., *The Great Chain of Being*. As mentioned above in Ch. 1, “An Abyss of Revelation,” *The Great Chain of Being* describes a structural schema of the relatedness of all created forms, from God downward in diminishing complexity to the mineral substance of the Earth. The idea was refined and expanded throughout the Middle Ages, and adapted again by the early modern Neoplatonists. It was a compelling doctrine that addressed the needs of many different disciplines, and served as a historical template for early explorations in the direction of biological evolution.

165. Aristotle, *Historia Animalium*, VIII, 1.

166. From “Glossary of Swedenborgian Terms Compiled by William Ross Woofenden, Ph.D.,” in Larsen, R., Larsen, S., Lawrence, J., and Woofenden, W., *Emanuel Swedenborg, A Continuing Vision*, Swedenborg Foundation, New York, 1988, p. 512.

But with this said, we will see in what follows that as new species come into being in the natural world of extension and time, their actual, three dimensional shape does become a function of matter's response to spiritual use. In nature, form finds its ultimate expression in shape, "shape" being understood in this secondary context as anatomical expression. This is an important distinction, as the Doctrine of Forms is one of Swedenborg's powerful conceptual tools available to theistic scientists, for exploring the mechanisms at work in organic evolution.

We also need to understand, as we move into Swedenborg's description of his intermediate forms, is that he will use "form" both ways, depending on the context of his discussion. We will find descriptors like "spherical," "angular" and "vortical" for these forms, and we must question whether these are hypothetical or concrete terms. Does "angular" really mean a shape comprised of "angles and interjacent planes"? Apparently so, as it is this quality of the Angular Form that produces the behavior of matter at this level. But we will also see that this angular form is matter of the lowest (most natural) degree. At the other end of the contiguum lies the Perpetuo-Celestial Form, "the most far removed from the ultimate or earthly form."¹⁶⁷ His description of this intermediate is hardly one of shape, but rather it is a conceptual, relational form that is only obliquely associated with shape.

This conceptual problem was anticipated by Swedenborg himself, who offers the following explanation:

We understand the properties of angular forms, and also of circular forms, in that they belong to geometry; but we little understand the properties of spiral forms, and scarcely at all, indeed not even scarcely those of vortical forms. When we have understood these, then certainly the principles of astronomy and the causes of magnetic forces will by no means be concealed from us. If our reason, supported by mathematical and philosophical principles, stops here, what hope is left us of penetrating to the qualities and faculties of a superior form? We cannot express by adequate terms, nor even by figures, things into which we do not penetrate.¹⁶⁸

167. *Ibid.*, Swedenborg, Emanuel, *The Fibre*, §§ 267.

168. *Ibid.*, § 266a.

So the solution to the problem of form or shape is context. In his Doctrine of Forms, Swedenborg is using the term in a generic sense, and will use it to denote shape or relational scheme as he sees fit. This is not a problem if we define it and remain aware that we may need to do some conceptual shifting as we go along.

THE INTERMEDIATE FORMS AND WHAT THEY MIGHT MEAN IN THE TWENTY-FIRST CENTURY

Sylvia, in *Proving God*, gives an excellent overview of Swedenborg's Doctrine of Forms, by interpreting the various intermediate forms as analogous to what are now known as quantum states. He rightly, I believe, identifies Swedenborg's cosmology as a theo-cosmology, with its origins in a pre-geometrical milieu of divinely inspired motion. He sets the stage for our discussion of the properties of these intermediate forms.

... Swedenborg believed that the foundation of physics lies in a pre-geometrical world that is entirely spiritual and consists ultimately of Divine, conscious action. The purpose of the created universe is to give *fixedness* to the infinitely complex flow of spiritual forces, which have their domain in pre-space. Spiritual forces gain fixedness by constraints and increased resistance to change, making quantum uncertainty simply action with fewer constraints, action that is therefore more expanded, non-local and indeterminate. These constraints on action are the laws of the universe that structure the universe into layers of existence. All action obeys laws, which are the parameters of the operations and functions of various substances, forces and their dispositional properties. The more constraints, the more classical (Newtonian) action becomes.¹⁶⁹

I would add that the more constraints, the more inert matter becomes, in its downward progression of spiritual to natural. At this point we know that these "layers of existence" are ordered according to the rules of operation for discrete and continuous degrees.

Working from this axiom, Swedenborg described these intermediates in great detail, but using descriptive terminology unique to the occasion. He

169. Sylvia, Edward F., *Proving God*, pp. 81–82.

was breaking new ground with this conceptual model, and he was on his own. He works from the bottom up, starting with the most natural, fixed, and imperfect of forms, describing each successive form as an extension of the one before it, and a precursor to the one to come. We end with the first and most perfect form of all, the Divine itself, the Infinite, in whom is all.

We will let Swedenborg introduce each of these, from §§ 261–268 of *The Fibre*, in his own language; note how the cursory descriptions flow from one to the next. Note also that what changes with the progression is the degree of *fixedness*, or in contradistinction, the degree of *fluidity*, which determines the nature of each form in respect to its ability to move and be moved.

The most imperfect form, which is also the ultimate of form, which is also the ANGULAR; and it consists of angles and interjacent planes, and is bounded by mere straight lines which are determined not to any common center but to other directions. This is apparent in triangles, quadrangles, etc.; for if lines be drawn perpendicularly from any point of the planes they do not flow together or meet in any given center, but perpetually intersect each other. (§. 261)

The next superior form is the CIRCULAR or SPHERICAL form wherein are no angles and no planes. For in order that angular forms may be elevated into this next superior or spherical form the angles must be cut off and the planes so rounded that no part of them remains; and therefore this form deserves to be called the INFINITELY ANGULAR or the PERPETUO -PLANE. (§ 263)

The form next superior to the circular, prior and more perfect, is the PERPETUO-CIRCULAR which is properly to be called the SPIRAL. For its determinations are not into continuous concentric circles, nor are they directed by means of radii or straight lines to any common centre; but they strive by means of continual spirals to flow towards a certain middle circle occupying the place of a centre, and towards its periphery or surface; through which circular surface they continue their fluxions, or strive to continue them, and from which, by means of radii, they look to the centre of their spheres, just as in the perfect circle. (§ 264)

The form next superior to the spiral form, prior and more perfect, is the PERPETUO- SPIRAL which is properly to be called the VORTICAL. (§ 265)

A form superior to the vortical, prior and more perfect, is the PERPETUOVORTICAL form which is properly to be called the CELESTIAL. (§ 266)

The form superior to the celestial form prior and more perfect, is the PERPETUO CELESTIAL, properly to be called the SPIRITUAL, and most far removed from the ultimate or earthly form. (§ 267)

The perpetuo spiritual form is the DIVINE form itself—not properly a form, but pure essence, life, intelligence, wisdom, and most utterly abstracted from space, time, matter, figure, motion, change, destruction. (§ 268)

Recall that we are dealing with intermediates of proto-matter—incomplete forms, if you will—or matter in the making, and although these do not compare directly to our modern model of subatomic quantum states, something very similar is at work here. We must not get lost in the details of these descriptions, as what we are dealing with are not structures *per se*, but (in modern terms) something more like plasmas and probability states. We will appreciate the practical value of this concept as we see how these successive forms occur in nature, for it is here that the Doctrine of Forms becomes another of Swedenborg's powerful tools for theistic science. "Where there is an external and an internal, there must be a conjoining middle."¹⁷⁰ As stated above, Swedenborg discovered that this "conjoining middle" from spiritual to natural was not a single step, but a transition zone, as it were, through which the divine steps down, from spiritual substance to natural matter.

What we see at work in the ANGULAR Form, the lowest, or ultimate level of matter, is a structural impediment to motion. Lines that "perpetually intersect each other" suggests collision, coarctation and ultimately, slowing, as cars do in heavy traffic. These are physical restraints to motion, and give matter its rigidity, solidity and permanence. Imagine gridlock, or a multi-car collision. Of interest is Swedenborg's description here of "the first of the angular forms" as being "minute tetrahedrons and octohedrons." It is tempting to imagine forms at this level giving rise to atoms locked in the semi-rigid structures of molecules. The ubiquitous carbon atom is itself a

170. Swedenborg, *Arcana Coelestia*, § 10,236.

tetrahedron, the shape of which renders it so amenable to the structural requirements of living organisms and minerals alike.

At any rate, matter at its most natural and least spiritual is matter that is constrained against “perpetual motion,” and as such is confined to the durable structures necessary in the natural world. Sylvia identifies these physical restraints as representative of the “natural laws” that govern the operation of matter at all levels.¹⁷¹ These macroscopic “laws” originate as extensions of microscopic (subatomic) principles of structure. Thus do very complex forms sometimes come from very simple origins.¹⁷²

Of perhaps greatest importance here is that Swedenborg rests this system on geometrical principles. His appreciation for geometry as the basis for creation is at once a look back to the ancients,¹⁷³ but a look forward, to the requirements of his own program as well. This is no rote recitation of the classical catechism (although Swedenborg was quite well versed in classical natural philosophy). What he finds, from his own investigations in chemistry and physics and mathematics, is geometry at work in nature. That this squares with Pythagorus and Plato and Euclid is simply a fact of common inspiration. Truth is truth, wherever and however one may find it.

The change that the SPHERICAL Form brings is obviously a lifting of resistance to motion. The angles are gone, and from the *Principia* we know that in circularity is the propensity for perpetual motion. It is “the verimost form of motion,” as it is resistant to “all manner of external attacks and assaults,” as all its radii meet in a common center. Because it is able to gyrate about, it is free of some of the constraints we saw with angular forms. This form allows fluidity as a function of its elasticity.

Of importance here is the utility of spherical forms in their conjunction with angular forms. Swedenborg points out that in nature we find the various forms associated with one another, and in the case of spherical with angular, it is the spherical that allows certain “primordial particles” to be “united into larger corpuscles.” This compounding of particles “mediate between the angular and the spherical” is facilitated by spherical forms, allowing the formation of “oils, spirits, the red blood, the white blood,”¹⁷⁴

171. Sylvia, Edward, *Proving God*, p. 82.

172. This will become a major premise in what follows, as I explain organic evolution as a process where forms of great complexity arise from very simple starting conditions—a departure from the conventional wisdom of complexity all the way down.

173. The Platonic solids of Euclidean geometry are brought to mind here, of course.

174. “The white blood” was Swedenborg’s term for the lymph.

and the other humors of the animal kingdom . . . the elements, which are in the angular form, could never coalesce without the presence of interjected globules and without mutual embraces and kisses.”¹⁷⁵

We see from this that the various forms in this series are not necessarily discrete, but readily act in concert with other forms. We shall see that this quality explains the mechanism of the cascade, as it were, of forms from the most perfect to the least. As stated above, this series is not so much a ladder as a transition zone, with forms in various associations to answer changing necessities of the moment. The circular form is the superior form, and is always prior; the angular form arises from the circular, as it is defined according to its comparison with the circular.

The SPIRAL Form has all the freedom of the circular, but because its radii are no longer static, it can rotate and undulate. This is a sphere, itself in motion, with a remarkable new potency: by moving along the radii from surface to center as of a greater sphere, an undulatory motion is achieved, which renders it “more constant than the circular in maintaining its own essence.” This “fluxion” is “a superior form of motion, more excellent or still more perfect than the circular; it is the form of active forces.” Once we have motion outside of the perpetually circular, we have for the first time a combination of motions—circularity with linearity—producing directional movement. The resulting undulation combined with this directional potential brings to mind the appearance of a wave function in these forms. With directional wave forms come fields, and such forms as these are reminiscent of the fields producing the quantum states known to nuclear physicists. This is a form in a very active state, that can by its high degree of fluidity and its obvious high energy, combine with and also give rise to other forms,

For here there is no concentration of determinations, but in the place where the spirals terminate there they are continued by circles. Here therefore we find some natural spontaneity. For in this form, a fluxion once commenced is continued with so easy a potency as to be almost spontaneous.¹⁷⁶

175. Swedenborg, Emanuel, *The Fibre*, Swedenborg Scientific Association, Philadelphia, 1918, § 263.

176. Swedenborg, *The Fibre*, § 264a.

This idea of “spontaneity” evokes the compelling image of atoms and molecules responding to environmental constraints and necessities, in the formation of new natural forms.¹⁷⁷

Each of these forms enters into the form below it in the series, and is contained within the form above, as in the working of a telescope. “For whatever is the cause of the cause is also the cause of the thing caused; and therefore the spiral form is the measure of the circular form, and the form of all the forms that follow.” Again, we are given the image of a zone of active transition, not the static image of a ladder. This is an energetic zone, where forms are constantly coming and going, according to the conditions of the moment, and constraints of time and space posed by the “laws” of the natural world.

As mentioned above, these forms are conceptual constructions, of levels of matter the specifics of which are difficult to imagine with clarity; we are to use them for what they can tell us about the origin of matter from spirit, and not for what they can teach us about physics *per se*. Swedenborg was well aware of these limitations, and of the necessity to acknowledge the speculative nature of these reasoned conclusions.

... the manner in which central gyrations are effected cannot be easily expressed in words nor represented by a figure, though I have attempted to represent it in my philosophical *Principia*; for when we ascend above the circular form the ideas of our understanding enter as it were a kind of shade.¹⁷⁸

Speculation notwithstanding, Swedenborg concludes with an important look at the practical application of this abstract concept:

Meanwhile, this form is obvious and conspicuous everywhere in nature and its kingdoms, since to it are due all the properties possessed by the circular form. Into this form flow the parts and volumes of the ether, and by its means they represent their modifications; so likewise in the animate body, the parts

177. The same image applies to particles on the subatomic level as well. The constraints here are imposed by the behaviors of these particles themselves—what they can and cannot do in response to environmental conditions and the presence of other particles. An entity at any level can only respond according to its innate set of physical parameters, to what it encounters. It is this response that determines its form at any given time, in a kind of equilibrium of all these forces and restraints.

178. *Ibid.*, § 264a.

and volumes of the purer blood, and also the medullary and nervous fibres. In the vegetable and animal kingdom also they are frequently conspicuous.¹⁷⁹

The spiral form is ubiquitous in nature; it serves many purposes and solves many structural problems, in a wide range of natural forms.

In the spiral form we have waves, and energy in motion, and from these we have fields; with fields come spatial orientation; with this we have the potential for three-dimensional orientation. We are building matter.

With the VORTICAL Form we are approaching a divide in our series. Recall that these intermediates move in a few short steps from the inert matter of our experience to the ineffable divine itself. Even for the relatively fixed forms encountered above, Swedenborg observed that as we ascend in the series, “the ideas of our understanding enter as it were a kind of shade.” In the vortical form, we are even closer to the Infinite, of which we have determined that nothing can be known except existence. The vortical form is a new and higher level of abstraction, of which Swedenborg says,

... here terms and expressions are altogether lacking whereby to distinguish them from each other according to their differences; for the idea of this form almost transcends the human understanding because it transcends geometry and its lines and curves.¹⁸⁰

We have entered a pre-geometric world of forms identified more with motion than with structure, more with intention than effect. To make matters worse, Swedenborg says that these are the forms of the “ether which constitutes the great vortex around our earth, and within which also the moon performs its orbits and periods.” We are immediately taken aback by this reference to such an archaic and simplistic icon of pre-modern science. Many would dismiss Swedenborg altogether on this statement alone. But as explained above, we must be very careful about how we read Swedenborg’s scientific works. Although he is respectful to existing authorities, he moves forward according to an agenda that pays little attention to scientific consensus for its own sake, but is based instead on his own experience and those authorities who square with it. The pernicious

179. *Ibid.*, § 264b.

180. *Ibid.*, § 265b.

phenomenon of “settled science” was alive and well in the Age of Reason, and Swedenborg, well aware of how this reference to ether would be taken, has this to say about it:

I am not unaware of what modern authors think respecting the existence of this vortex, but this causes me no delay since the actual phenomena fully persuade me that they can be explained in no other way.¹⁸¹

He is obviously not concerned with convention, and he seems confident that in what follows, the reader will come to understand what he means by this “ether” of vortical forms.¹⁸²

What sets this form apart from its preceding spiral form is its association no longer with motion alone, but with the *conatus*, or endeavor, that inspires it. Again, he finds “spontaneity” in it, which suggests that we are working at the edges of the divine will at work in the coming-into-being of matter. It is no wonder that “this form almost transcends the human understanding.” The series is maintained, Swedenborg explains, by the ratio of this form to the spiral, the spiral to the circular, and the circular to the angular, in an orderly causal series. In a provocative use of language, he also says that these transitions are related by transmutation.¹⁸³

181. Ibid, § 265.

182. Swedenborg introduced his concept of a universal “ether” of “fourth finites” in his *Principia*, Vol. II, §§ 277, 279. As he so often does, he is co-opting a well-known term here by using it in an entirely new way, and thereby injecting a certain confusion for the casual reader. His ether has nothing in common with the ancient concept of a celestial medium, or the *luminiferous ether* of eighteenth century physics. Norman Newton discusses this very important issue at length, explaining that Swedenborg’s ether is very much like the “quantum foam” from the “quantum fluctuations” thought to generate sub-atomic particles that come and go in “space”; which is to say that there is indeed some fluxion of what we today might call a “plasma,” even in a vacuum; which is to say that there is no possibility of a vacuum in the quantum world. This unsettling idea was well known to Swedenborg, despite the “settled science” of his peers to the contrary. See Newton, Norman, *The Listening Threads*, Chapter 6, “The Ether and the Solar Vortex.”

183. Swedenborg, *The Fibre*, § 265. *Transmutation* is a loaded term, evoking as it does the principle central to Alchemy, of changing one element into another by a series of alchemical operations. Part mysticism, part proto-chemistry, Swedenborg would have been familiar with this tradition, as its operative division had served as the basis for much of the chemistry that he knew, and many of his peers were thoroughgoing alchemists. Although Swedenborg rejected alchemy for the nascent scientific discipline of chemistry, one is tempted to see this as a discreet allusion to the mystical nature of this whole series of intermediate forms. See Duner, David, *The Natural Philosophy of Emanuel Swedenborg*, pp. 267–270, for a discussion of Swedenborg’s experience with and attitude towards alchemy.

As a “perpetuo-spiral” form . . . the vortical can gyrate around as many centres as there are points in the periphery of the circle to which it has respect. Therefore the gyration of this form is to be styled a *perpetuo central*, or, more simply, a vortical gyration. Hence also it follows that this form, compared to the spiral, is still more constant in remaining in its own essence.¹⁸⁴

This is manifested as yet another move away from fixity towards freedom of movement, even towards spontaneity. This implies a certain willfulness in its motion, lacking in previous forms, whose motion is secondary to the impetus of superior forms. But despite this decidedly abstract interpretation of the vortical form, Swedenborg is quick to remind us that

There are innumerable phenomena which confirm the actuality of this form and its fluxion. In nature there is an infinity of things which can never be reduced in an intelligible manner to any geometrical or analytical calculus, and yet we are persuaded of their existence. Thus there are many things the existence of which must be confessed even though we be ignorant of their nature. This form is obvious everywhere in nature and is seen from phenomena; for to this form is owing all that is possessed by the spiral form, consequently all that is possessed by the circular, and finally by the angular. For into this form flow the parts and volumes of the superior ether, which constitute the great vortex around our earth; likewise, in the animate body, the parts and volumes of the purest blood [cerebrospinal fluid] or of that highly fluid animal essence which runs through the simplest fibres; and moreover, the simple fibrils themselves.¹⁸⁵

His examples from nature are the magnetic force, and the formation of poles and meridians in a magnetic system, of which the earth is an exemplar. A field theory for the electromagnetic force is highly significant for the eighteenth century; and Swedenborg is aware that this is the same force driving his “subatomic” forms as well—one mechanism at work at all levels of reality. This represents a significant contribution to the history of thought.

Swedenborg has here defined magnetism as a force, projected into a symmetrical three-dimensional field, derived from the inherent motion of

184. *Ibid.*, § 265a.

185. *Ibid.*, § 265b.

vortical forms moving about at the edge of reality. This same force exists for a magnet, and for astronomical bodies as well. In his persistent effort to make these concepts appear as practical as possible, he reminds us, “It is thus apparent that forms of this kind really exist in the universe of nature, or in the world.” For him, these ideas are not free-floating abstractions; they are the metaphysical principles underlying very real natural phenomena. He saw his doctrines as tools, which can assist us in doing theistic science in new and powerful ways.

Swedenborg tells us first that the CELESTIAL Form is

“the supreme of all natural forms, and constitutes the great expanse, and in the Sacred Scripture, Heaven . . . Its determinations direct their windings by celestial spirals, like so many radii, to a certain vortical gyre, holding the place of the centre, and around it they continue their fluxions.”¹⁸⁶

Here we see the system at work: this gyre has respect to the spiral form, the spiral to the circular, the circular to the angular. A good analogy for these intermediates is to describe them as a holographic series: each form is contained in its entirety by previous and successive forms, while maintaining its own individual structural integrity. The orderly hierarchy of discrete degrees is obviously at work here, but among the various forms in their order there is also a dynamic interaction. The gyres at work in the celestial forms—the very forces at work in the formation of galaxies—“trickle down” into the forms below; all the way down, in fact, to the celestial forms of the *simple fiber* itself—the ground substance of all organic forms.

Examples of this form at work in the universe of our experience “are exceedingly few” we are told, because “they lie inmosty concealed in nature.” But its existence cannot be doubted, because from reason we can see that without it there would be none of the forms subsequent to it, i.e., the vortical, the circular, etc. These less perfect forms that generate visible phenomena must take their existence from forms prior to them; and as this series ascends to the Creator, in whom is all, its forms become more

186. *Ibid.*, § 266. Swedenborg refers directly here to the creation narrative of *Genesis* I, but this also refers to the “starry universe” in a more general sense—the expanse that we might refer to as “interstellar space.”

greatly abstracted. Here Swedenborg moves from objective knowledge to knowledge from reason, to ascend to levels above the senses, an intellectually defensible method at gaining truth about natural, and even spiritual things.

The celestial form is identified as a “simple substance,” . . . and relatively to all natural forms and substances, a unit void of figure, extension, magnitude, gravity, and levity, and therefore not material. That in it nothing can be said to be above or below, or to be carried to a centre, or a surface or along a diameter. But one and the same point in fluxion is seen to be set in the centre, in the radius, in any periphery whatsoever, and in a thousand simultaneously and successively . . . I call this form, or if you prefer, this substance, simple, because it is the first natural form; above it, is the infinite itself (as will be seen), and below it: are compound forms or substances.”¹⁸⁷

This form is to be found in *Genesis* 1:2, where we find “the spirit of God . . . hovering over the face of the waters.”

To fully grasp the enormity of the universal, holographic concept revealed by Swedenborg’s Doctrine of Forms moves one’s perception of the world around us to a new and higher level of consciousness. This is Swedenborg’s *contiguum*, the full spectrum of spiritual-natural reality, manifested as a single dynamical unit at work, from the Creator down to inert natural matter. Scientists working from this axiom will ask different questions, will design different experimental systems to answer them, and will no doubt find very different answers, to explain the workings of the natural world. And from this perspective they will ask questions about causation not heretofore allowed, by the orthodoxy of scientific materialism.

From the celestial form, a level above the senses, but nonetheless accessible by reason and analogy, we ascend into the world of SPIRITUAL Form, which Swedenborg equates with the divine spirit itself.¹⁸⁸ This is not the form of spiritual beings, or souls, we are told; these are celestial forms, created for the reception and influx of the spiritual form. They are

187. *Ibid.*, § 266a.

188. We are about to make a distinction here, between divine spirit, *Existere*, as manifested in the going forth in creation, and *Esse*, unknowable essence of God itself. We will find that this spiritual form differs from *Esse* only in its participation in the series angular, circular, spiral, etc. *Esse*, as the source and inspiration of all forms, is nonetheless above all comprehension.

not spiritual, but are receptacles of spirit.¹⁸⁹ Of the spiritual we can say little, as it is

Above all created nature, and therefore incomprehensible, ineffable, inexpressible by the most sublime analysis of the human mind, form in the abstract, contemplating all other forms in order outside itself and at the same time in itself, in that they are perfect. For if we progress by a series like the one we have just instituted it follows that the spiritual form refers itself to the celestial, just as the latter refers itself to the vortical, and so on to the angular, which is the last in the order of respects and representations. Thus it can be said that this form contemplates other forms both as outside itself and as within itself.¹⁹⁰

This form is the “principle of existence, subsistence, action, life, understanding and wisdom.” Although it is altogether distinct from all things natural, those things nonetheless gain their existence from it, as it flows into the descending series of greater and greater fixity, and finally to purely natural forms themselves. From our limited perspective, we can have no objective knowledge of this level of divine operation; but again, from reason, we can ascend to a certain level of understanding of it, and from previous arguments, some degree of confidence that the spiritual form is the source of all forms.

It might at first seem strange that the celestial and not the spiritual form is the level from which flows all natural forms. We find the explanation for this distinction between the celestial and the spiritual in Swedenborg’s delightful digression into the historical development of the concept of a

189. We are reminded here of the perennial problem of the presence and operation of divinity in the human being—an enormously complex problem with which Eastern and Western traditions have wrestled. Without exploring the various historical approaches to this question, suffice it to say that this is the old “attachment- freedom” problem, with pantheism and deism lying at the extremes. Swedenborg solves this conundrum with his Doctrine of Forms: souls are celestial forms, receptive of but not continuous with the spiritual. This makes souls (and the people who live from them) agents of the divine, but in freedom to reject its inspiration. In various places he uses the term *impletion* to describe this relationship: the spiritual form enters into celestial and subsequently lower forms by *impletion*, as water fills a cup. See *True Christian Religion*, § 697 where Swedenborg uses this term to describe the interaction of the soul and body.

190. Swedenborg, *The Fibre*, § 267.

simple substance, found in § 266a of *The Fibre*.¹⁹¹ At the end of this lengthy paragraph, concerning the celestial form, he explains,

Thus the divine essence which is above, is not to be called a simple form, since the name form is not suitable to it. This substance [the celestial form] was called by ancient philosophers “the *prima materia*, which is moved with a motion that consists in receiving form;” and they said that “form is desired by it as eagerly as perfection is desired by that which is imperfect.”

The idea is that although the divine essence is doubtless the source of all things, as the One of the ancient world, and Being Itself in Judeo-Christian terminology, nothing else can be predicated of it. Therefore its place and operation in the series of forms cannot be determined. There is no ratio between the preceding forms, even the celestial, and the divine.

Applying Swedenborg’s theological terminology to the spiritual and divine forms, we would describe the DIVINE Form as *Esse*, of which we can know nothing, even from the most powerful abstraction, but Being itself. This is the I AM of *Exodus* 3:14, and the *Ein Sof* of the Kabbalistic system. The spiritual form is *Existere*—the unknowable I AM going forth in creation. It is this motion that causes the first thing to move from spiritual to natural¹⁹²—the *first natural point* of Swedenborg’s *Principia*, and the foundation of the world.

Just as with the spiritual form, there is no doubt that the Divine flows into the forms below it in the series; but just as with the spiritual—and even more so—the divine form does so in an unknown way.

191. This idea of a simple is an essential principle for its implications for theories of cosmological origins. In § 266a of *The Fibre* Swedenborg provides us with a good grounding of its historical development, and of his own take on the problem of origins. This will become very important to what follows in Part V, Intelligent Default, where the issue of mechanisms for evolution will require some rationale for the premise that complex forms can arise from simple starting conditions. For this reason § 266a in its entirety, with brief introductory comments, appears as Appendix G.

192. Prime Mover: A notion as old as metaphysical speculation itself, is the belief that matter must begin in some way with a “push” from the divine. Swedenborg calls this push a *conatus*, which is sufficient to bring the *first natural point* across the spiritual-natural nexus into a pre-geometric existence, with induced circular motion in one dimension. This point can now go about compounding with other points, into more and more complex forms [the intermediate forms now under discussion], until finally, with the building up of the *elementary particle*, apprehensible matter is born.

For in it [the divine] is all that is perpetual, infinite, eternal, unlimited, holy; and it is the order, law, idea of the universe. This form inflows into celestial and angelic forms, and into our souls, by the mediation of the spiritual form and of the Word. But so many are the arcana, that it is better to be silent, to be lost in astonishment, to fear and adore, than to speak of this subject in a way not holy, that is to say, from nature.¹⁹³

We have ascended to the divine, and because of its obscurity we cannot know its relationship with the series of transitional forms below it. But although the divine is above abstraction, we can be confident that all things that come about by means of the cascading of forms, originate in the divine form. We know this by the signature characteristic of this series in its operation, the order inherent in it. And we know that God is order itself.¹⁹⁴

We have spent a lot of time with Swedenborg's doctrine of forms. As stated at the beginning, this is the least known of his doctrines, likely because of the abstruse nature of his explanations. But in several places he acknowledges that language has failed him, in the face of concepts so abstracted from normal experience that there is no clear way to proceed. But what he was unable to provide in clear technical descriptions of these forms, he more than provides in giving us a sense of their dynamical operation. These are not static structures, rungs on the Ladder of Nature, to be climbed from nature to spirit. These are forms, in the strict philosophical sense—patterns of behavior—of proto-matter, as they increase in complexity to enter into relationship with other such forms, until the natural world is filled with minerals, plants and animals, all in response to spiritual cause. The language of this response will be called spiritual-natural *correspondence*, but the syntax of this language—the rules that allow it to be spoken—are found in the orderly series of forms that link the two worlds.

Each step in this series represents a subtle change, not in shape, but in state. In the twenty-first century we would be at home with these "forms" as changes in quantum states; and this is what makes Swedenborg's forms so difficult to comprehend. He has worked his way to a spiritual-physical reality that he understands, in the context of his cumulative thinking. Each new idea makes sense because it is based on previous ideas that made sense

193. Swedenborg, *The Fibre*, § 268.

194. Swedenborg, *The True Christian Religion*, § 52.

too, and so on. His starting point is the very simple axiom that says bodies have souls; natural reality comes from spiritual reality. Without much to guide him, he slipped the bonds of scientific orthodoxy and began a program of independent research to discover the mechanism by which this operates.

But the spiritual-natural reality he came to know was unknown to him or any other scientist of his day. He could not describe his ideas in precise scientific terms, because those terms were yet to come. He could not know the true nature of many of the things he described in general, because the specifics of many of these things would not be known for two hundred and fifty years. Was this supernatural prescience? Mystical insight? Revelation? It was revelation only in the sense that anything that we learn about the workings of Creation is a kind of revelation, even if our methods are mundane. But that is all. The special senses and mystical insight would come later, as he elevated his senses and refined his scientific doctrines into eternal spiritual principles.

Swedenborg came to the knowledge of intermediate forms as the solution to the problem of connection because he had to know how this worked, in order to move one step more, to the purpose behind Creation. So he took what he knew, added this to what he had learned from others, and made bold, new propositions based on what had to be the case. His genius was driven by necessity.

What we gain from this astonishing intellectual accomplishment is a powerful tool for use in our own search for scientific truth. Like Swedenborg, this theistic method will take us beyond the comfortable limits of orthodoxy, but if it is truth that we seek, and not the approval of “settled science,” then there is truth to be found, about how spirit comes into nature, creating as it comes.

The doctrine of correspondence:

“The Spirit of the Living Creatures was in the Wheels.”

Spiritual and Natural Things Interact by Means of Corresponding Function. Things that are separated by discontinuous degrees of order cannot interact directly. But if both participate in a similar function or use, they may resonate across structural degrees in a kind of harmony. This harmony explains the spiritual essence, or final cause, of all natural things.

God as Divine Human is the supreme form embracing all uses, from which form all other uses in the created universe have their origin, and thus the created universe, viewed as to uses, is an image of Him. Those things which, from God-Man, that is, from the Lord, are by creation in order, are called uses.¹⁹⁵

And God said, Let us make man in our image, after our likeness.¹⁹⁶

We have come a long way from our opening sequence of images found in the first chapter of *Ezekiel*. And we have come a long way in our survey of the powerful doctrines that Swedenborg developed for his program of theistic science. It would be expedient to revisit *Ezekiel* at this point, who can help us bring all this together. His was an otherworldly vision of God, on a throne, or fiery chariot, high above an assembly of fantastic “living creatures” who “ran back and forth . . . like a flash of lightning.” They went straight ahead, we were told, “wherever the spirit wanted to go; and they did not turn when they went.” These creatures did not go on their own and they did not go alone. Beside each one was an equally fantastic apparition in the form of an awesome “wheel in the middle of a wheel,” with their rims “full of eyes all around.” They went where the creatures went, *for the spirit of the living creatures was in the wheels*.

Here is a powerful mystical image of the Glory of the Lord above the firmament, his spirit causing the living creatures to move, and yet they do not move without a uniting medium: their spirit, we are told, was in the wheels. Here, in divine analogy, is a story of Creator and creation, with clear indication of the necessity for some active principle—in this case the wheels within wheels—for the transmutation of spiritual into natural reality. These wheels were not mechanical things, but dynamic fellow travelers that somehow streamed the spirit of the Lord through themselves to animate the living creatures. The overarching impression that remains is not the Lord, not the wheels, and not even the creatures, as fantastic as they may be. We are left with the lingering mental image of the unanimous action of the three, with the Lord as end, the wheels as cause, and the creatures as effect.

The principles (*doctrines* in Swedenborg’s terminology) that we have examined were necessary tools to explain the same thing, but on a more

195. Swedenborg, Emanuel, *Divine Love and Wisdom*, § 298.

196. *Genesis 1:26 Holy Bible* (New King James Version).

pragmatic level. As we have seen many times, he wanted to know how spirit comes into nature, creating as it goes. As an Age of Reason natural philosopher, he wanted to understand this from objective experience and measured reasoning. The problem was connection, and although each new doctrine promised to move him that much closer to his goal, none could provide the jumping-off-place that he was looking for. His sublime model of intermediate forms, the highest of which are essentially ineffable, had finally provided the gap, but it could not provide the active principle that could bridge it. The Lord crosses this divide, to establish his creation, yet despite all that Swedenborg had learned of the steps in this progression, a mechanism for the actual transit remained out of his reach. This final doctrine would be the key to his scientific program, and it would prove to be so powerful that it would lead him out of science altogether. The doctrine of correspondence, his “science of sciences”¹⁹⁷ was the axiom upon which he would build a new spiritual paradigm.

Swedenborg had begun as early as 1719 to inquire into how an impulse in one place might cause an effect in another. In *On Tremulation*, he showed his interest in action-at-a-distance, and even then speculated on the communicative nature of “corresponding cotremulations” between a fluid and a hard substance.¹⁹⁸ In a single, fleeting reference to the Creator as the “all-wise God of nature,”¹⁹⁹ Swedenborg, the nascent scientist, validates his thinking as theistic; but the work otherwise confines itself to natural phenomena proper to human physiology, avoiding some obvious opportunities for speculation on spiritual cause. The stage is set at age thirty-one for Swedenborg’s life-long quest: an understanding of the operation of spirit and nature. The theistic emphasis in this work would increase with his experience. How does spirit move, in its descent into the world? How do the two worlds correspond?

Swedenborg had specific ideas about divine influx. He was very careful to walk a line between the extremes of pantheism and deism, seeking a system in which there was sufficient freedom for individuals to participate in their own regeneration, but enough interaction with the divine to allow for the operation of providence in the natural world as well. Spiritual influx was

197. Swedenborg, Emanuel, *True Christian Religion* § 201.

198. Swedenborg, Emanuel, *On Tremulation*, Chapter XIII, last paragraph.

199. *Ibid.*, Chapter III, § 4. The similarity of this phrase to Spinoza’s famous *Deus sive Natura* (God or nature) is of interest here.

of two natures, general and specific.²⁰⁰ Most importantly, it was directional, flowing from spiritual to natural, and never the other way. This led him to realize that we can only ascend so far in our human efforts to reach God. Complete understanding comes only in the descent from spiritual into natural. This in turn led him to consider his own limitations as a theistic scientist, finally addressing this problem in terms of “two foundations of truth.”²⁰¹ But these ideas were preliminary; much remained to be explained. What was the actual nature of the divine as it moved into Creation? How did it manifest itself in nature?

God above the heavens is *Esse*, the unknowable I AM. However, once this goes forth, God the Creator reveals himself as a reciprocal dualism of active and passive complementaries—identified by Swedenborg as Divine Love, a receptive quality from which springs all that is good, and Divine Wisdom, the active element of all truth. These are comprehensible principles, and understanding that the Creator is both of these in operation explains the complementary, binary nature of all things of creation. The natural world becomes less abstract and more familiar with this powerful doctrine; the *conjugal principle*²⁰² is predictably present in all things. The implications for science are obvious and enormous. Perceiving the complementarity at work in the natural world explains the internal arrangement of its individual elements; it does not explain how those elements are related, however, and according to what laws of order.

From his earliest works Swedenborg had understood this limitation. There must be some underlying principle of order by which all things of Creation, spiritual and natural alike, are arranged. We find this order in his *contiguuum* concept—the pattern of connectivity he observed between the parts of all things of nature, and between these things themselves. From minerals to plants to humans, the most complex animal of all, the same pattern pertains—a relational scheme of parts to parts according to what he called *discrete* and *continuous degrees* of order. This was a universal “filing system,” as it were, by which all things exist according to two simple rules

200. Swedenborg, Emanuel, *Arcana Coelestia*, § 5850.

201. Swedenborg, Emanuel, *Spiritual Experiences*, § 5709, 5710. Here Swedenborg acknowledges the efficacy of science based on natural truths, but is clear that this level of knowledge is subordinate to spiritual truths from revelation.

202. See Bell, Reuben, “The Conjugal Principle,” *New Philosophy*, Vol. C, Nos. 1 & 2, January–June, 1997, for a comprehensive survey of this binary principle manifested in all created things.

of behavior: they may be related by a series of discontinuous steps, like branches, or they may exist along a succession of continuous degrees, from greater to lesser in magnitude. And those, he said, are the only two ways that things may be related. With this powerful doctrine of series and degrees, Swedenborg tamed the ostensible chaos of the natural world. He came to understand that beneath all visible phenomena lay this simple principle. It explained things, and this is the epitome of a good scientific model at work.

He demonstrates the utility of this principle in *Dynamics of the Soul's Domain* (1740), Chapter III, "The Human Soul," a detailed chapter dealing with the mechanism of getting from spiritual to natural. As a practical matter, Swedenborg gives us two examples of how this mechanism might work. In an explanation of the "three bloods," he compares three members within a relational series. We may divide the blood into its series of three degrees, a "red blood" with spherules, a "purer blood," or blood without the cells, and the "purest blood," which is separated in the brain and collected there.²⁰³ We have a dynamic model here, of a series of substances, "or what is the same, the forces of substances, disposed, or flowing forth in degrees."

He explains this with his "doctrine of series and degrees":

In order, therefore, to arrive by this purer or mediate blood, at the next higher blood, let us divide a part of it, in thought, since we cannot divide it by sight, into its prior, that is, its constituent or primitive elements; and we shall then come to that purest fluid, which is said to be in the third degree above the blood; or in the first when the red blood is put in the third. A similar law prevails in all other things; since there is nothing in nature but is a series, and in a series. . . . A series, therefore, is whatever contains substances, or what is the same, the forces of substances, thus disposed or flowing forth according to degrees: thus there are series of two, three, four, or more degrees. According as these series are mutually conjoined and communicate, so are they the series of an order. Properly speaking, these are series and orders of successive things. But there is also a series and order of simultaneous things, or of substances or forces of one and the same degree, as between a largest and least volume . . . This fluid is in the third degree above the blood, which it enters as the first, supreme,

203. Swedenborg is here describing whole blood with its complement of cellular elements, the lymph-like fluid that remains when the cells have been removed, and cerebrospinal fluid—all derived from a common humoral system and separated for specific functions.

inmost, remotest, and most perfect substance and force of its body, as the sole and proper animal force, and as the determining principle of all things.²⁰⁴

But despite the power of this doctrine to explain such anatomical relationships, he admits that degrees will get us up the ladder of nature only so far. When we attempt to visualize “those things that transcend the sphere of familiar things,” we need terms “still more abstract and universal.”

The doctrine of series and degrees, however, only teaches the distinction and relation between things superior and inferior; or prior and posterior; it is unable to express by any adequate terms of its own, those things that transcend the sphere of familiar things. If, therefore, we would ascend to a higher altitude, we must use terms which are still more abstract, universal, and eminent, lest we confound with the corporeal senses things, of which we ought not only to have distinct perceptions, but which, in reality, are distinct. Hence it is necessary to have recourse to a *Mathematical Philosophy of Universals*, which shall be enabled not only to signify higher ideas by letters proceeding in simple order, but also to reduce them to a certain philosophical calculus, in its form and in some of its rules not unlike the analysis of infinities; for in higher ideas, much more in the highest, things occur too ineffable to be represented by common ideas. But, in truth, what an Herculean task must it be to build up a system of this kind! What a stupendous exercise of intellectual power does it require! For it demands the vigilance of the entire animal mind, and the assistance also of the superior mind or soul, to which science is proper and natural, and which represents nothing to itself by the signs used in speech, takes nothing from the common catalogue of words, but by means of the primitive and universal doctrine we have mentioned,—connate both with itself and with the objects of nature,—abstracts out of all things their nature and essence; and prepares and evolves each in the mutest silence. To this universal science, therefore, all other sciences and arts are subject; and it advances through their innermost mysteries as it proceeds from its own principles to causes, and from causes to effects, by its own, that is, by the natural order.²⁰⁵

204. Swedenborg, *Economy of the Animal Kingdom [Dynamics of the Soul's Domain]*, § 222.

205. *Ibid.*, § 211.

Here we are told that to ascend into a proper understanding of such relationships, we will need a “calculus” that will enable us to deal symbolically with the Infinite. But what “an Herculean task,” he says, to build such a system. This “science of sciences,” once we comprehend it, will take us from the world of effects to the world of causes, “for the truth of nature, and the truth of revelation, however separate, are never at variance.” It is obvious that there is some mechanism for bridging this divide. The symbolic language that can disclose the Infinite in all things is a *universal mathesis*, which will later become Swedenborg’s doctrine of correspondences. The seed is there, in 1740, for what will come.

We find a different kind of comparison in *The Fibre* (1742), of two things that are not obviously related: the conjoined activity of an artery and a nerve fiber. Here the red blood runs through the artery, and “animal fluid” (the first degree of the blood) runs through the nerve. In this manner the two correspond.²⁰⁶ The structures are similar as hollow vessels, and the materials in each are members of the same series. This is an attempt to show that two things may be *related in function*, but apart in space. This is a significant move towards the goal of a clear doctrine of correspondence—a harmony of function or use.

Further in *The Fibre* Swedenborg does the same, but on a grander scale, with the histological relationship of small arteries in the cerebral cortex with the “cortical glands” there.²⁰⁷ In § 171, he raises the question of whether the small arteries terminate in a gland, or whether the vessels produce glands along their way. His solution is unique: since we really cannot see it clearly enough with our (1742) microscope, we will refer the question elsewhere in nature, and solve the problem by analogy. He does this by observing how this problem is solved in the (very visible) plant kingdom! By looking at buds and fruit, he found that these arise from the covering of a twig that then keeps on growing. This may be quaint science to our sophisticated eyes, but it displays a remarkable faith in the order of nature; and here again, we

206. Swedenborg, Emanuel, *The Fibre* (1742), § 161.

207. These are the neurons and glial cells of the cerebrum that Swedenborg would have observed with his microscope. He called these variously “glands” or “spherules,” based on their appearance. It must be understood that Swedenborg did his anatomical work long before 1838–39, when botanist Theodor Schwann and zoologist Matthias Jakob Schleiden formulated their “cell theory” for biology. It is almost impossible to comprehend how scientists went about their work in histology and physiology without this comprehensive doctrine to guide them.

find Swedenborg thinking in terms of corresponding form and function. We are still a long way from a comprehensive doctrine of correspondence, but here, in 1742, we find Swedenborg making the turn towards corresponding function as the key to the problem.

Swedenborg had hit a wall of sorts. There was one really important thing that the doctrine of series and degrees could not explain. With this orderly arrangement of levels within levels, we can imagine our way upwards to finer and finer things. In *The Infinite and the Final Cause of Creation* (1734) Swedenborg did just this, only to find that even if the steps were infinite in number, and each more sublime than the one before it, no single step could achieve the final shift from nature to spirit. Try as he might, this doctrine would not take him there. What remained was a finer look at this crucial step, to determine what was at work in the transmutation of spirit into nature.

As we have seen, this was not a step at all, but a series, not of steps *per se*, but intermediate forms, each autonomous but interactive with its neighbors. In his doctrine of forms Swedenborg's science becomes overtly theistic; some forms are essentially natural, some forms participate in both worlds, the higher forms are scarcely natural at all, and the highest, spiritual form is "divine spirit itself." Yet their coordinated activity facilitates the condensation of matter from spirit, in an orderly succession of forms of greater and greater inertia, to finally produce the matter of the natural world. This series of forms provided the separation necessary to avoid the error of pantheistic connection. This is arguably Swedenborg's greatest achievement. He knew that he needed a doctrine to explain the correspondence between the two worlds, but what was holding him back was not the concept of a functional relationship between two things apart in space. As we can see, this was a concept central to his earliest works. He was describing "corresponding cotremulations" in *On Tremulation* as early as 1719, and the correspondence between anatomical structures in *Dynamics of the Soul's Domain* in 1740. As we have seen, he understood the utility in a clear relational doctrine for things of differing degree, and he was using that doctrine to explain things in his anatomical works. What he could not formulate was a doctrine for the correspondence between things of spiritual and natural degrees. Here is a statement to this effect, in *Rational Psychology*, a work on the human mind, or soul, written in 1742. He clearly had this principle in mind as he writes,

There is a science of sciences, that is, a universal science, which contains in itself all other sciences, and from which, as being parts thereof, they can be resolved into this science or that. Such a science is not acquired by learning; it is connate, being especially connate in souls which are pure intelligences Unless the soul were furnished with such a science, it could never flow into our thoughts and infuse them, as it were, with the power of understanding and expressing higher things; nor could it construct all its organic forms in conformity with the inmost and most secret laws of mechanics, physics, chemistry, etc. Therefore, the fact that there is such a science cannot be denied.²⁰⁸

And he speaks of the world of thought and the world of experience in a kind of harmony:

. . . superior forms contain in themselves everything that can be contained in inferior forms, just as a universal genus contains within it all its species. Thus a superior form is the order and principle of the forms that follow it, and consequently, of all their forces, modes and qualities. Thus, if there is a nexus like that of the soul and its body by means of organic forms, *the superior forms sensate in themselves and their very nature all that is in harmony with their form, or in disharmony; consequently, all that can possibly be present in inferior forms.* (Emphasis added.)²⁰⁹

He is certain that this system of harmony can be formalized into a set of laws, or even a mathematical model, and he uses concepts from his doctrine of forms²¹⁰ to explain how this might work.

Indeed, it seems possible that this science can be submitted to calculation; but as to how, this can be perceived from what occurs in respect to the internal sensory; to wit: all ideas, both material and intellectual, are nothing but changes of the state of the sensory and intellectory. The nature of these changes of state can be understood from the description of forms, especially the circular and spiral.²¹¹

208. Swedenborg, Emanuel, *Rational Psychology*, § 563.

209. *Ibid.*, § 565.

210. This doctrine, though not published, had been completed and inserted into *The Fibre*, in 1742, written the same year as *Rational Psychology*. It was a new idea, already being put to use.

211. *Ibid.*, § 566.

But here, as we anticipate an elucidation of this powerful doctrine, we find instead an apology of sorts:

Thus it is indeed possible to submit ideas of the mind to calculation, whence arises a universal mathesis; but from this, no certainty can be deduced unless the certainty from which the equations are to be commenced be presupposed and acknowledged. Moreover I should also like to have set forth one or two attempts; indeed, I have ascertained the possibility thereof. But there are many rules to be premised, data to be set forth, and truths to be connected together, before I can undertake the task. And even then, we fall at last into a Gordian knot or equation; and to extricate ourselves therefrom would require an amount of labor greater than the value of the work justifies us in devoting to it. Moreover, from the slightest error in the calculation we can fall into many fallacies. For this reason, I forbear making the attempt²¹²

He promises another work, a *Key to Natural and Spiritual Arcana by way of Correspondences and Representations* to come, but we do not find this in his works that follow.²¹³ What follows is the slow apprehension of correspondences, coming together as he continued his transition from scientist to revelator, as the active bridging principle between the two worlds, made possible by his remarkable doctrine of forms.

We find the same reticence three years later, in the final installment of his scientific program, *The Five Senses* (1745). On the verge of his theological period we find him still speculating on the true functional nature of the nexus, and admitting that much remains for a complete understanding of correspondence.

There is a similar mode and similar ratio of proceeding truths which are to be sought and in forms which are to be determined; although the one is in an inferior sphere, the other in a superior, and although the one is physical, or

212. *Ibid.*, § 567.

213. Although this never appeared, Swedenborg left an unpublished manuscript entitled *An Hieroglyphic Key To Natural And Spiritual Mysteries By Way Of Representations And Correspondences*, in which he lays down a template for comparing things on three discrete levels according to the "harmony or analogy" between them. Written in 1744, it is a tentative work, but fully appreciates the presence of such a relational system at work in the world. This may well represent a draft of the promised work, and indicates his continued interest in developing this concept.

natural, the other moral, and the other spiritual. They mutually correspond to each other, with a difference only of perfection, *as will be seen in the doctrine of correspondences*. (Emphasis added.)²¹⁴

At this point, he fully understands what correspondences do. Although he still cannot explain how the process works, he has come to the conclusion that understanding correspondence will require the elevation of our reasoning above the natural senses.

As the atmospheres act upon the animal microcosm, so supreme celestial forms act upon the soul, not only celestial forms of which the soul is a part, but also, spiritual forms, in which our soul is and lives; the soul is not only actuated and moved, but also affected, and, moreover, modified. By means of correspondence and analogy, we can learn from the one about the other, *although it transcends the sphere of common understanding*. (Emphasis added.)²¹⁵

It will take all the power of his complete scientific program, he says, brought to bear on this problem of correspondence, to bring it into the light of reason.

... but we cannot describe that correspondence, and the harmony thence arising, and their affection, until we have reviewed the whole animal kingdom [*regnum animale*, or domain of the soul, i.e., the human body], its cortical substance, the blood, the spirit, the soul, the fibers, the brain, indeed also the doctrine of forms, of influxes, of correspondences; thus in the meantime it becomes necessary to speak in words not well understood.²¹⁶

Here, at the close of his scientific period, this powerful doctrine is still not complete.

An understanding of correspondences begins in the world of our experience, but then requires us to elevate our minds by means of the rational faculty (even here, an example of correspondence at work!) to fully comprehend the spiritual end of the spectrum. *Forms* are abstruse;

214. Swedenborg, Emanuel, *The Five Senses* (1745), Swedenborg Scientific Association, Philadelphia, 1914, § 631

215. *Ibid.*, § 684.

216. *Ibid.*, § 660.

correspondence is ineffable. Both require that we use all three eyes for clear vision at this level of inquiry.

The notion of corresponding anatomical elements had come early to Swedenborg, as he began his ambitious program of describing the soul's operation in the body. Over a period of twenty-six years, his focus had moved from nervous vibrations, to the humoral elements of the blood, to the organs, to the brain, and finally to the *simple fiber*—the most fundamental element of the living body. Identifying this with the vortical form, he understood it to be the structure²¹⁷ giving rise to all other structures; and he found that it existed in both worlds, bridging as it were, the spiritual and the natural, as an agent of creation. In doing this work, he moved beyond structural comparisons alone, and began to compare the various anatomical or histological structures in terms of their functional relationship in a hierarchical scheme. He called this dynamic relationship *correspondence*, but as we have seen, he did not explain its actual mechanism in his scientific works.

Upon completion of *The Five Senses* (1744) the scientific program is suspended, and we find Swedenborg a man in transition. He reports unsettling dreams, visual hallucinations, and finally, waking spiritual experiences. For five years he is busy with various theological projects that point in the direction of the final phase of his life, as revelator for the New Jerusalem.²¹⁸ This intermediate period is of particular importance, as it is here that a mature philosophical basis for the doctrine of correspondence, emerging fully formed as it does in the *Arcana Coelestia* of 1749, quietly comes of age. In *The Worship and Love of God* (1745) we find this statement, remarkable in its simplicity, remarkable for its significance, and remarkable for where it appears:²¹⁹

217. This simple fiber is not entirely natural, Swedenborg says, but exists as an intermediate for translating spiritual influx into natural forms. Other fibers, and ultimately all tissues develop from the compounding of these fibers.

218. The many excellent biographies of Emanuel Swedenborg notwithstanding, the best explanation for his transition from scientist to revelator is still to be found in Acton, Alfred, *An Introduction to The Word Explained*, Academy of the New Church, Bryn Athyn, PA, 1927. Acton, an undisputed expert on Swedenborg's scientific works, explains this transition, and the period of relative obscurity surrounding it, and makes plain the direct transmission of Swedenborg's powerful scientific doctrines into the theological Writings for the New Church. To Acton, there were not two Swedenborgs, but one "Servant of The Lord," from *On Tremulations* (1719) to *True Christian Religion* (1771).

219. There is mild consternation on the part of New Church scholars over the place for the theological works produced by Swedenborg during this intermediate period. From an urgent necessity for orthodoxy, some relegate these to the outer darkness of the

There is nothing in universal nature which does not derive its form, and thus an appearance of body, from a certain soul, and this is the case not only with the subjects of the animal kingdom, but also of the vegetable. *The souls of these latter are uses, designed by heaven itself as ends; in conformity to those uses they are generated and grow; for, as was above observed, effects are only uses unfolded and sent forth into the gyre of nature. But in our minds uses are called ends, because they are intended by us and thus living. According therefore to the number of ends is the number of the parts of the soul's intuition, each of which, in order to become uses in effect, must put on a kind of body. For unless ends, like souls, by a clothing of body, are emitted into the gyre of nature, they cannot be set forth and represented as actual uses.* (Emphasis added.)²²⁰

What we have here is a template upon which a working doctrine of spiritual-natural correspondence can be constructed. It is overdue; we have seen just how long it took for Swedenborg to formulate this simple statement of corresponding uses. Perhaps he thought correspondence should be more complicated than it is. People have historically been drawn to the Church of the New Jerusalem for its teachings on correspondence, and they are often startled at first, even a little disappointed, at this same simplicity. But its simplicity is deceptive, resting as it does on the conceptual richness of the doctrine of forms; without the forms, there can be no correspondence. Recall also that Swedenborg admonished us that we would not appreciate correspondence “until we have reviewed the whole animal kingdom, its cortical substance, the blood, the spirit, the soul, the fibers, the brain, indeed also the doctrine of forms, of influxes, of correspondences.”²²¹ Simple, yes. Easy, no.

What is important is that this intermediate period was a time of intense exploration—internal and external—for Swedenborg, who felt a strong pull into a world whose parameters were not yet clear. It was a time for

“pretheological works,” while others find in them concepts useful to the greater aims of the New Jerusalem. Some do not regard them at all. Tentative as some of these might be, Swedenborg apparently made sure that they were preserved along with his other works, giving us cause to consider them for what they may have to offer.

220. Swedenborg, Emanuel, *The Worship and Love of God* (1745), Massachusetts New Church Union, Boston, 1914, § 64, footnote g. Here is a bridge between the incomplete doctrine of correspondences of the scientific works, and its mature counterpart found complete in the *Arcana Coelestia* of the theological Writings.

221. Swedenborg, Emanuel, *The Five Senses* (1745), Swedenborg Scientific Association, Philadelphia, 1914, § 660.

finishing and refitting his scientific discoveries into principles useful for new, theological uses. One of these, namely correspondences, would play a central role in his theology for the New Jerusalem.

We find a comprehensive treatment of correspondence in the inter-chapter material of the *Arcana Coelestia* (*Secrets of Heaven*), spanning chapters XXIII–XXVI.²²² Here we find the doctrine in full form, with numerous examples of its utility.

Few are aware of what representations and of what correspondences are. Nor can anyone know what they are unless they know that there is a spiritual world and that this is distinct and separate from the natural world. For between spiritual things and natural things correspondences exist, and the manifestations of spiritual things within natural are representations. They are called correspondences because they correspond, and representations because they represent.²²³

Listen to the difference in tone! Swedenborg is no longer speculative, and he is no longer starting from the natural and ascending the “ladder of nature” to the spiritual. Even the Latin style changes abruptly as we move from the formal language of eighteenth century scientific literature to the almost conversational Neo-Latin of the theological Writings. We get the very real sense that Swedenborg has relaxed, and is confidently working from a different agenda.

To gain some idea of representations and correspondences, it will do if one considers simply the things that belong to the mind, namely, thought and will. These usually shine from the face in such a way that they are plainly visible in its expressions. Above all else interior affections shine out of the eyes and in the eyes. *When the parts of the face act as one with those of the mind they are said to correspond and exist as correspondences, while the actual looks on the face represent, and exist as representations.* It is similar with the things that are expressed by gestures in the body, and also with all the movements which are effected by

222. In the *Arcana Coelestia*, a twelve volume exegesis of the internal, spiritual sense of *Genesis* and *Exodus*, Swedenborg regularly departs from the running narrative for topical explorations on subjects such as charity, life on other planets, his own spiritual experiences, and in this case, the doctrine of correspondence. He runs these serially, inserting installments at the ends of chapters.

223. Swedenborg, Emanuel, *Arcana Coelestia*, § 2987.

means of the muscles. The fact that these are expressions of what a person thinks and wills is well known. The actual gestures and movements, which belong to the body, represent the things which belong to the mind, and exist as representations; and when things of the body accord with things of the mind they are correspondences. (Emphasis added.)²²⁴

Look at his examples of correspondences: The bloods? Tunics of nerves and arteries? Cerebral glands and apple blossoms? No. Spiritual stuff is mind, he says, and to understand correspondence, we just look at how the mind controls the changing aspects of the human face. This is simple: Instances of complete agreement; complete harmony of use.

It may also be known that images do not take shape in the mind exactly as they present themselves in the countenance, but are purely affections that take shape there. Nor do acts take shape in the mind exactly as they present themselves through actions in the body; rather, it is thoughts that are configured there. Things that belong to the mind are spiritual while those that belong to the body are natural. From this it is evident that a correspondence exists between spiritual things and natural, and that there is a representation of spiritual things within natural. Or what amounts to the same, when the things that belong to the internal person take shape in the external, the things which are visible in the external are representative of the internal, and those in the external which accord with those in the internal are correspondent.²²⁵

Finally, some specifics: Correspondence is *between* spiritual and natural, while representatives are *of* spiritual phenomena *in* the natural.

The representation of spiritual things by natural, and the correspondence of natural things with spiritual, may also be known from the consideration that what is natural cannot in any sense come into being without a cause prior to itself. Its cause exists in that which is spiritual. Nothing natural exists which does not have its cause there. Natural forms are effects and cannot appear as causes, let alone as the causes of causes, or first origins. Instead they take the forms they do from the use they perform in the place where they belong.

224. *Ibid.*, § 2988.

225. *Ibid.*, § 2989.

Nevertheless the forms taken by effects represent the things that exist among causes, and these causes in turn represent those that exist among first origins. Thus all natural things represent those that exist among the spiritual things to which they correspond, and those spiritual things in turn represent those that exist among the celestial things in which they have their origin.²²⁶

Here is a philosophical argument, not unlike those so common to his scientific works.

Nothing exists, he says, without a cause, so natural things *must have* spiritual causes. Again, simplicity and clarity.

From much experience I have been granted to know that in the natural world, and in its three kingdoms, not even the smallest thing exists which does not represent something in the spiritual world, that is, which does not have in that world something to which it corresponds. Among many other experiences the following has made this clear to me: Several times when I have been talking about the organs of the body and have been tracing the connection of them from the things of the head to those of the chest, and even to those of the abdomen, the angels above me have on those occasions led my thoughts through the spiritual things to which these parts of the body corresponded, doing so indeed in such a way that nothing was inexact. They did not think at all about the organs of the body as I was doing, only of the spiritual things to which those organs corresponded. The angels' intelligence is such that from spiritual things they know every single part of the body, even the most secret, which cannot possibly come to be known by man. Indeed they have a faultless knowledge of every single thing in the entire universe, and this they have because causes, and the first beginnings of causes, exist among those spiritual things.²²⁷

Again, knowledge from experience. But how does Swedenborg know these things? "From an abundance of experience I have been granted . . ." The experience is just as real here as it had been to Swedenborg in his scientific period, but this experience is of an entirely different kind. It is direct experience of the spiritual world, and the angels and spirits there. He speaks with confidence—he does not apologize for, or qualify these statements.

226. *Ibid.*, § 2991.

227. *Ibid.*, § 2992.

And this knowledge is not from himself; it has been *granted* him to know. There is a new humility here, in our brash scientist now turned revelator.

Though in this world a very deep arcanum, nothing is better known in the next life, known even to every spirit, than the truth that all things in the human body have a correspondence with things in heaven. So true is this that not even the smallest part in the human body fails to have something spiritual and celestial, or what amounts to the same, the heavenly communities, corresponding to it. For heavenly communities exist according to all the genera and species of spiritual and celestial things; indeed they exist in such order that all of them together represent one human being. They do so in every single detail of the human being, both interior and exterior. This is why heaven considered as a whole is also called the Grand Man (*Maximus Homo*). The reason why heaven is described in this way is that the Lord is the only Human and heaven represents Him.²²⁸

Here Swedenborg begins a description of the mystical concept of Creation in human form, that he will develop in chapters to come. The heavens correspond to the Human Form, with a society of angels answering to every possible function of that form; and the human body, in all its particulars, corresponds in use to the totality of these heavenly societies.²²⁹

This may also be recognized to some extent from the fact that the spiritual or internal person, which is their spirit and is called their soul, in a similar way has a correspondence with their natural or external person. The correspondence is such that the things belonging to the internal person are spiritual and celestial, but those belonging to the external are natural and bodily, as becomes clear from what has been stated above in §§ 2988, 2989, about looks on the face and movements of the body. Furthermore as to the internal person the human being is a miniature heaven since they have been created in the image of the Lord.²³⁰

228. *Ibid.*, § 2996.

229. A difficult concept at first, Swedenborg deals with this in such depth and breadth, and in such practical terms, that it becomes a common-place of New Church theology. But it has yet to be properly appreciated, even among devout adherents of the New Jerusalem Church; and it has yet to become a useful concept among those who might benefit from it the most—physicians, psychiatrists, and healers of every stripe.

230. *Ibid.*, 2997.

As seen above, the soul is in correspondence with the body. In all things there is a dualism of spiritual and natural.

Consequently each and all things in the universe represent the Lord's kingdom, so much so that the universe with all its constellations, its various atmospheres, and its three kingdoms is nothing else than a kind of stage on which the Lord's glory as it exists in heaven is represented. In the animal kingdom not only man but also each living creature, even the smallest and meanest of them, is representative, such as the caterpillars. These crawl on the ground and feed on plants, and when the time to mate is at hand they become chrysalises. Soon after that they are furnished with wings, with which they are raised up from the ground into the air, which is their heaven. There they enjoy freedom of movement as they sport together, obtain nourishment from the best parts of the flowers, lay their eggs, and so produce a future generation. At this time they attain that state which is their particular heaven and also their beauty. That these things are representative of the Lord's kingdom anyone may see.²³¹

Correspondence is the means by which everything of the universe portrays the Lord's heavenly kingdom. Of interest here is his use of an example from nature to depict spiritual things, a practice going back to his scientific works.

Henderson offers a good working definition of correspondence as

... both a causal and a functional relation between the Divine and the spiritual, or between a spiritual and a natural thing. When a natural object, activity or phenomenon is the effect of which a spiritual thing is the cause, and when the two perform analogous uses to the body and the mind, respectively, they are said to be in correspondence; and the natural thing is said to correspond to the spiritual, or to be a correspondent.²³²

In what follows in the inter-chapter material on correspondences, Swedenborg describes what he learns from spiritual experience, leaving the framework of his natural experience (his science) behind. But of essential interest to a theistic scientist, he brings his method of observation, commentary and synthesis unchanged from before, into this new arena.

231. *Ibid.*, § 3000.

232. Henderson, W. Cairns, *Our New Church Vocabulary*, General Church Publication Committee, Bryn Athyn, Pennsylvania, 1981, p. 8.

He is no less an observer and reporter than in *On Tremulations*. His *analysis* is still a useful tool, in interpreting what he sees, but his *induction* has been superseded by divine instruction on how things work, in the spiritual and the natural worlds. And the things he learns are of use to us, in the highest degree for our salvation, but in lesser degrees as well, for the elucidation of natural truths. Swedenborg's powerful doctrines, appearing as they do in his scientific program and perfected in his theological Writings, are ours to use, as we follow a new scientific method based on the two foundations of truth.

A DOCTRINE OF EVERYTHING

"Wherever the spirit wanted to go, [the living creatures] went, because there the spirit went; and the wheels were lifted together with them, for the spirit of the living creatures was in the wheels." Spirit descends into nature by means of intermediates—forms to accommodate the descent—and nature comes into being by means of this same cascade of forms. Thus all things of Creation have a continuous spiritual cause.

The living creatures did not go on their own. The wheels went with them—those mystical wheels, whose "rims were full of eyes all around them." And the "spirit of the Lord" made the creatures move . . . but not directly. It was the "wheels in the middle of the wheels"—those otherworldly fellow travelers—that transformed the spirit into something that could make the creatures move. They were something in between, to facilitate entry of the Lord's will into the world.

Correspondence, for our purposes, is not the wheel itself. Those wheels had "eyes in the rims," and "the spirit of the creatures' was in them. Correspondence is the "wheel in the middle of the wheel"—the unseen active principle that makes creation work. It is the means by which the spirit of the Lord—the Human Form Divine—passes downward into Creation, imparting life, form, rationality and freedom to all things there, according to this reflexive principle of divine harmony.

This is truly the "science of sciences," because within it are all the other principles that bring it into the light of our understanding—comprehensive

knowledge of “the whole human body, its cortical substance, the blood, the spirit, the soul, the fibers, the brain, and also the doctrine of influxes and forms.”²³³ The doctrine of correspondences is the “Doctrine of Everything.” Following Descartes,²³⁴ Swedenborg was careful to make the quantum distinction between spiritual *substance* and natural *matter*, two very different levels of reality because of the disparate qualities of each. The mechanism for bridging these discrete degrees is by means of the corresponding use, or function, of entities on both sides. In philosophical terms, “use” might be a relative abstraction. In biology, however, the term implies a rich category of practical possibilities—an organism’s function as revealed by its natural history, the structure / function of each of its parts, or the role the organism may play in the ecological niche it inhabits. The niche itself is a biological use, corresponding in potential to a spiritual use, and waiting to be filled with analogous organic forms. A knowledge of correspondence, and all that supports the concept, could be very useful to the open-minded biologist looking to explain the still unsettled problem of organic form.

We have spent considerable time in tracing the intellectual achievements of Emanuel Swedenborg, from his early days as theistic scientist, up to and beyond his transition to mystical theologian. The goal has been to show that the discoveries of his scientific program were relevant to, and consistent with, his later theological revelations, and that from this understanding we can consider Swedenborg’s entire output a single corpus. The claim is that Swedenborg’s discoveries are as useful for scientific inquiry today as they were in his own day—perhaps more so now, as we struggle to come to terms with the increasingly peculiar landscape of the quantum universe. Swedenborg was at home in just such a pre-geometric world. As he moved from his life of science to his new life of spiritual discovery, he carefully preserved his scientific model for us to use, when the time was right. That time may well be now.

In the final chapter that follows, I intend to put Swedenborg’s powerful doctrines to use in addressing an open question in the biological sciences,

233. Swedenborg, *The Five Senses*, § 660.

234. In the sixth of his *Meditations*, Descartes develops his famous mind-body dualism, based on the claim that spiritual and natural substance were distinct and separable, with fundamentally differing attributes. Natural matter was extended, he said, while spiritual, thinking substance was not. This led to the modern philosophical mind-body problem which Swedenborg addressed first with his concept of *co-established harmony*, and then resolved with his doctrine of correspondence.

namely the problem of the origin and apparent plasticity of organic forms. The scientific doctrine known as the Neo-Darwinian Synthesis has produced a powerful model for biological evolution over the last one hundred fifty years that answers many of the questions of the ancient, classical, and early modern natural philosophers, concerning the appearance of organic forms, and how these forms seem to be so well adapted to their environment. But as with any scientific model, there are problems. By putting Swedenborg's tools to use on these problems, I intend to shed new light on how the earth brings forth new forms, not from within the ostensible chaos of random nature, but by means of spiritual influx into nature, of the Human Form Divine.

Although any number of biological problems might be addressed by these same principles, I have selected evolution for the universality of its attachment to all of biology. With the Neo-Darwinian Synthesis, all roads in biology eventually lead to evolution. Samir Okasha explains this very well, in a discussion of causation in biology, when he says,

Restricting our focus to evolutionary theory and genetics may seem unusual, given the wealth of other biological subdisciplines, but it is a natural choice for at least two reasons. First, Darwinism is arguably *the* grand unifying theory in modern biology, much as Newtonianism was the grand unifying theory in eighteenth- and nineteenth-century physics. (The Russian-American biologist Theodosius Dobzhansky wrote in 1967 that 'nothing in biology makes sense except in the light of evolution', a statement that still holds true today.) So philosophical problems that arise in evolutionary theory (of which genetics is an important part) are in a sense problems for the whole of biology; and causation is the source of many such problems.²³⁵

From the point of view of biology, this is essentially self-explanatory; but from the point of view of theistic science, there is more. Although we will primarily be discussing the origin of living forms, our discussion will begin at the beginning: the nature and behavior of matter at the quantum level—a level of organization below that of atoms, or the "subatomic world"—and at a level prior even to that—an energetic, "pre-geometric"

235. Okasha, Samir, "Causation in Biology," Chapter 35, in the *Oxford Handbook of Causation*, pp. 707–708.

world of origins, that is as much spiritual as natural. Evolution is the “coming-into-being” of living forms on one level, but we will find that those processes mirror processes in the non-living world as well. In Swedenborg’s spiritual-natural contiguum, activities at all levels, involving matter in all states or organization, conform to the same governing principles of order, behavior, association and correspondence. To focus on evolution is to focus on one integral unit of a holographic series encompassing all of creation.
(to be continued)