

The Resurrection of a Loser: How Naturphilosophe Achieved Little Immediate Success
But Still Holds the Potential For a Comeback in the Scientific Community

By Dan Boyle

December 10, 2007

“Nature! We are encompassed and embraced by her - powerless to withdraw, yet powerless to enter more deeply into her being. Uninvited and forewarned, we are drawn into the cycle of her dance and are swept along until, exhausted, we drop from her arms.ⁱ”

This quote is from one of the foremost figures as far as German nature philosophy is concerned: Johann Wolfgang von Goethe. What he says here is a sentiment that is representative of a number of different people throughout eighteenth and nineteenth century Germany. These people were fascinated by nature and what one could deduce from observing it. The point of nature philosophy was not to develop an entirely new set of rules to replace empirical natural science but to expand on science in the way of observation methods as well as scope of science as a whole. In this paper I hope to demonstrate how nature philosophy rose out of the arguments against the Enlightenment and also how it was impacted by numerous different factors. This *naturphilosophie*, as it came to be known, was a very individualistic type of scientific observation in many ways. One of the interesting things I hope to show is how it connected to the religious movement known as Pietism. I hope to summarize the major figures involved with nature philosophy and their resulting influences both in the field and beyond. As a conclusion, I will discuss the reasons why nature philosophy really was “a loser” when it came to eighteenth and nineteenth century science, how it has seen somewhat of a resurgence in some regards, and what benefit it could possibly have to those willing to invest their efforts.

ⁱ Arthur Zajonc, “Goethe and the Science of His Time: An Historical Approach,” in *Goethe’s Way of Science*, ed. David Seamon and Arthur Zajonc (Albany: State University of New York Press, 1998), p 21.

BRIEF HISTORY OF THE ENLIGHTENMENT

Before diving directly into any conversation about nature philosophy, romanticism, or anything like it, it is imperative that we investigate the time period that preceded it. Unfortunately, the term “enlightenment” is entirely too broad of a topic to dedicate sufficient time and effort towards. So many things can be said about it and because of this, we will be forced to make gross generalizations about the predominating thoughts of the day. The time period we are focusing on is primarily the eighteenth century, but many people feel it is important to also include the Age of Reason in the seventeenth century. Also, while many countries and continents experienced their own “enlightenments” of varying degrees, we are focusing on the European phenomenon focused in Western Europe.

The predominating characteristic of this time period was the focus and importance of reason over anything else. Thanks to men like Newton, knowledge became increasingly important. The Enlightenment thinkers attempted to apply systematic thinking to all aspects of life, including the political. A number of political works came out of this period, such as those of John Locke. The Enlightenment was heavily indebted to the accomplishments of men like Boyle, Newton, and Galileo during the Scientific Revolution of the seventeenth century.

Generally, we can sum up the Enlightenment by mentioning three separate principles. First, all genuine questions can be answered. If a question cannot be answered, then it is therefore not actually a question. Second, all answers are knowable, and they can be discovered by means which can be taught. Third, all answers must be compatible

with each other, for incompatibility will result in chaos. These are the general tenets of rationalism as a whole, and we quickly see that the only way to discover these answers is by the use of reason. It is this logic that lent the Enlightenment thinkers to believe that there is no reason why since this does not work for mathematics and science, it cannot also work for fields such as aesthetics and politics. However, we quickly come to see that the Enlightenment was not a uniform movement of which all members were alike. There were many divisions inside the movement.

One idea that is common among them is the view that virtue consists ultimately in knowledgeⁱⁱ. It is this common thread that was home to the thought that if we know who we are, and we know our needs and how to get them, and we then do this in the best possible way, then we can live free and contented lives. Things such as equality, liberty, and justice were all compatible, and if it were not so, then this would be incorrect. This seems to be similar to some of what Friedrich Wilhelm Joseph von Schelling had to say, as we shall later see.

The large difference in the view of God by those of the Enlightenment and those of the Romantic movement is that the Enlightenment thinkers saw God as a geometer, while the Romantics saw God as an artist. The philosophes saw the world as being perfectly constructed by means of geometry and mathematics, while the Romantics did not deem it necessary that there be a rational explanation for each and every aspect of the world.

It is interesting that, according to Isaiah Berlin, the Germans developed in a different manner in the seventeenth and eighteenth centuries. “German culture drifted

ⁱⁱ Isaiah Berlin, *The Roots of Romanticism* (Princeton: Princeton University Press, 1999), p 25.

either into extreme scholastic pedantry of a Lutheran kind - minute but rather dry scholarship - or else into a revolt against this scholarship in the direction of the inner life of the human soulⁱⁱⁱ". It is out of this that the pietist movement became deeply embedded in Germany. Pietism was a branch of Lutheranism that stressed careful study of the Bible and respect for the relationship between God and man. Emphasis was placed on spiritual life, stress on the individual relationship of the individual suffering human soul with his maker, as well as other things^{iv}. This will be discussed in greater depth later in the paper.

One of the most important pieces of work during the Enlightenment was the *Preliminary Discourse to the Encyclopedia of Diderot* by Jean d'Alembert in conjunction with the actual *Encyclopedia* of Denis Diderot. There are certainly other works that are extremely important, but both of these are representative of exactly what the Enlightenment stood for: the classification of knowledge. d'Alembert states that the purpose is: "to contain the general principles that form the basis of each science and each art, liberal or mechanical, and the most essential facts that make up the body and substance of each^v". He argues for a number of things in the discourse, among them that religion should be made scientific and rational. In addition, the *Encyclopedia* was modeled on Bacon's admonition that above all the scientist should be a collector of facts^{vi}. d'Alembert and his sympathizers felt that knowledge should be classified and

ⁱⁱⁱ Ibid. p 35.

^{iv} Ibid. p 36.

^v Jean Le Rond d'Alembert, *Preliminary Discourse to the Encyclopedia of Diderot* (Chicago: University of Chicago Press, 1995), p 4.

^{vi} Marvin Perry and others, *Western Civilization: Ideas, Politics, and Society From the 1400s* (Boston: Houghton Mifflin Company, 1989), p 405.

readily available to all and the printing press would serve the needs of the Enlightenment.

ROMANTICISIM AND NATURPHILOSOPHE

Like most movements, it is rather difficult to summarize such a broad topic with so many diverse concerns attached to it, but one thing that is common among those who adhere to it is that nature is so closely connected to God. Unlike during the Enlightenment, God and nature cannot be forced apart. For the nature philosophers, the two are one. Nature by itself cannot be admired; but, if it is attached to God then it can be seen in this manner. George Wilhelm Friedrich Hegel wrote:

Nature in itself in the idea, is divine, but in the specific mode by which it is nature it is suspended. As it is, the being of nature does not correspond to its concept; its existing actuality therefore has no truth; its abstract essence is the negative, as the ancients conceived of matter in general as the non-ens. By because, even in this element, nature is a representation of the idea, one may very well admire in it the wisdom of God^{vii}.

This was very different from the way the philosophes viewed the relationship between God and the world. They saw God as being completely detached from the world that he created, while the romantics saw God as inseparable. While the philosophes all but destroyed the notion that man is a spiritual being, the romantics came to stress this principle.

Out of the Enlightenment came the continued rise of empirical thinking, and people continued in their attempts to apply it to political economy and government as well as the physics, chemistry, and biology. There is an obvious dichotomy between the empirical method based on experiments and the Romantic naturphilosophe method, based

^{vii} Georg Wilhelm Friedrich Hegel, *The Philosophy of Nature* (Kessinger Publishing, <http://www.kessinger.net>), p 2.

on ideas.

Romanticism is difficult to come up with a definition, just like many of the other movements being focused on. These people were too diverse in interests: they were conservatives and liberals, revolutionaries and reactionaries. However, it can be said that their central message was: “the imagination of the individual should determine the form and content of an artistic creation^{viii}”. Whereas the philosophes criticized religion and faith because it distorted reason, the romantics denounced rationalism because it crushed the emotions of individuals and impeded creativity. The romantics focused on the uniqueness of the individual, while the philosophes often stressed those characteristics that were representative of a large number of people. William Blake once said: “the reasoning power in man is an incrustation over my immortal Spirit^{ix}”.

Another large difference between the philosophes and the romantics was the methods used to learn. For the romantics, it was impossible to learn to write poetry or paint pictures by following the rules of a textbook. One could only learn to create by trusting their own feelings. The most beautiful pieces of art were spontaneous expressions of feeling; they were not photographic imitations of something that already existed.

Naturphilosophe is not something that all Romantics necessarily agreed with, or even understood. There were those Romantics who did not care at all about science and what it could do for the world. Beyond that, some Romantics did not understand what naturphilosophe could do for anyone. According to Robert Richards, it is possible to be a

^{viii} Perry, *Western Civilization*, p 482.

^{ix} William Blake, *The Complete Poetry and Prose of William Blake* (Berkeley, California: University of California Press, 1982), p 102.

Naturphilosophen without being a Romantic biologist^x, and because of this, he feels it is necessary to differentiate between the two. As far as those who held credence in Naturphilosophie, they regarded living nature as exhibiting fundamental organic types that came to be known as archetypes. These archetypes could be set inside of more fundamental types, with the most basic of all of these being the archetype of the organic. Because of this, it bulged with numerous classes of insects and other creatures and plants beyond reckoning. Immanuel Kant had first argued that this structure of organisms in an archetypal fashion suggested that originally had been produced by the very ideal that they embodied^{xi}. What Kant proposes here would result in an *intellectus archetypus*, a mind whose conceptions would be productive. This, of course, would be the Divine mind, or some form of God.

However, it is important to note that here is one example of how even some of the Naturphilosophen disagreed: “Schelling and Goethe countered that if archetypes proved a necessary methodological assumption for the biologist, then there was no reason to argue that nature was not intrinsically archetypal, that is, essentially organic rather than mechanistic^{xii}”.

The Naturphilosophen adopted the metaphysical position of monism. This meant that matter and *Geist* (spirit or mind) are regarded as two aspects of the same *Urstoff* (primary matter). Because the natural world contained so many layers - various organic

^x Robert J. Richards, *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe* (Chicago: University of Chicago Press, 2002), p 8.

^{xi} Ibid. p 8.

^{xii} Ibid. p 9.

types, substantial unity, etc - it was thought that it displayed higher-ordered patterns. To these people, nature was a “cosmos”. It was a harmoniously unified network of integrally related parts.

The Naturphilosophen often thought that individual organisms and nature as a whole were to be ordered teleologically^{xiii}, which meant different things to different people. Once again, we return to Kant to set the stage for this argument. Kant argued that one has to understand all biological organisms as if they had been designed so that dissimilar parts functioned as both a means and an end. This would ensure that these two parts would contribute to the well-being of the entire organism. The differences arose when talking about the British view and the German context of the Naturphilosophen. While the British appealed to a separate creator who imposed final order on wayward matter, the Germans: “conceived nature in Spinozistic fashion - it was *Deus sive natura*: God and nature were one^{xiv}”. Practically, this meant that the teleological structuring of all biological organisms was modeled after the conceptual structuring of the ideas in terms of which nature understood.

It is obvious how all of this flies in the face of what the philosophes taught. All of a sudden, nature ceased to be mere product of the Creator’s design and it instead became producer of all things, including itself. This proves that nature moved from a simpler, less organized state to a more progressively developed state. Nature also becomes temporalized, as it took on the form of a completely historical entity^{xv}. The mechanism of

^{xiii} Ibid. p 10.

^{xiv} Ibid. p 11.

^{xv} Ibid. p 11.

the philosophes would not fit in with intrinsic temporality, as the clockmaker analogy of God would produce a stable and coherent world that was perfect from beginning to end falls far short. This view is anything but temporal, and is quite ahistorical as well. The view of the Naturphilosophen held that history would be understood as inscribed in the very bones of nature: “individual organisms recapitulated the history of their species as they went through their own ontogenic development^{xvi}”.

The Romantic biologists were often confused with, or at least, mistaken for, Naturphilosophen. In fact, depending on who one talked with, they could be the same people. The scientists referred to as Romantic biologists most often accepted the metaphysical and epistemological propositions of Naturphilosophen. However, they took to heart Kant’s analysis of the logical similarity between aesthetic and teleological judgments^{xvii}. They came to regard these two types of judgment as complementary approaches to nature, which allowed that artistic experience and expression might operate in harmony with scientific experience and expression. Romantic biologists also maintained that: “the aesthetic comprehension of the entire organism or of the whole interacting nature environment would be a necessary preliminary stage in the scientific analysis of respective parts^{xviii}”. For them, art became employed in the logic of scientific demonstration, as images contained scientific content that was often impossible to describe in words.

Romantic thinkers considered the scientist and the artist to be comparable, in that

^{xvi} Ibid. p 11.

^{xvii} Ibid. p 12.

^{xviii} Ibid. p 12.

they both used their creative imagination. Also, when they addressed nature, they both found in their object a source of similar creativity. It is because of this that the Romantic biologists concluded that in nature: “from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved^{xix}”.

We already learned that the individual self stood as a principle object of moral focus for the Romantics. The foundation was laid by Fichte’s metaphysics and Schelling’s transcendental philosophy. Fichte said that the absolute self created and strove to develop both the empirical self and the nature that stood over against the individual, while Schelling began to investigate how the empirical self and nature reflected each other and developed in an intimate relationship with one another. Nature eventually became the principle resource for the creation of the self.

What we are presented with here, is that Romantic biology requires of all of its adherents that they be of the Naturphilosophen, but the same cannot be said. By no means were all Naturphilosophen of the Romantic variety.

FRIEDRICH WILHELM JOSEPH VON SCHELLING

For those enraptured by nature philosophy, God was not devoid of the world; he was very much a part of it. This did not exclude nature. Schelling once wrote: “Nature releases no one willing from her tutelage; there are no naturally born sons of freedom.^{xx}” And because of this, nature, in turn, is a part of every person.

The man most responsible for the development of nature philosophy was the

^{xix} Charles Darwin, *On the Origin of Species* (London: Murray, 1859), p 490.

^{xx} Richards, *The Romantic Conception of Life*, p 136.

German philosopher Friedrich Wilhelm Joseph Schelling. Schelling was a German philosopher, who was not well-known until taking up a post as a private tutor for an aristocratic family and moving with them to Leipzig. While living in Leipzig, Schelling immersed himself in the studies of medicine, physics, and mathematics. Because of this newfound interest, he quickly arrived at: “a picture of nature that emphasized polarity and dynamism^{xxi}.” He quickly broke from the Fichtean themes^a that previously dominated his work and began to work on an entirely new phase of his philosophic career; however, these themes still had their place.

According to Schelling, the major task of naturphilosophie is: “to begin with a refined understanding of nature, a nature articulated with the help of the latest empirical theories, and to show how its various phenomena and relationships can be regressively chased back into the ego as their only possible source^{xxii}.” In saying this, Schelling proposed two things. The first is that if he is identical with nature, he can understand the essence of living nature as well as he understands himself. The second thing is that if all of this is true then it is possible that nature might create a path back to the self. “But not only might one discover oneself in nature; the exploration of nature might even be regarded as a necessary propaedeutic to the development of the self, or one’s character and personality^{xxiii}.”

^{xxi} Friedrich Wilhelm Joseph von Schelling, *Ideas for a Philosophy of Nature* (Cambridge: Cambridge University Press, 1988), Introduction p ix.

^a Johann Gottlieb Fichte (1762-1814) was a German philosopher and one of the founding figures of the movement known as German idealism. This movement took Immanuel Kant’s writings and developed them further. One major idea of his was that consciousness is not grounded in anything outside of itself.

^{xxii} Richards, *The Romantic Conception of Life*, p 133.

^{xxiii} Ibid. p 134.

One of the major points that Schelling made was in disagreeing with some of Newton's principles of matter. Whereas Newton described matter as made up of hard, inert, impenetrable particles that are acted on by forces external to them, Schelling stated: "we must posit its essence in an absolute inertness...but this is a concept without sense or significance^{xxiv}." This point is one that is common throughout the field of nature philosophy, as Schelling admitted that he derived it from Kant's construction of matter found in *Metaphysical Foundations of Natural Science*^{xxv}. This point was followed up by his second goal: to develop a more potential theory than that of Newton. He hoped for this theory to find its result by way of transcendental idealism^b.

While displaying a number of rationalist characteristics, Schelling could not put himself entirely in that camp. This was mainly due to his being unable to agree with Friedrich Heinrich Jacobi, the German philosopher who was instrumental in the construction of nihilism, when he said: "it is in the interest of science that there be no God^{xxvi}." He did identify with and used much of what Jacobi wrote, but was set on disagreeing with the one-sided intuitionism that this view presented.

In his *Ideas For A Philosophy of Nature*, Schelling sees the final goal of his research in such a manner:

Nature should be Mind made visible, Mind the invisible Nature. Here then, in the absolute identity of Mind in us and Nature outside us, the problem of the possibility of a Nature external to us must be resolved. The final goal of our

^{xxiv} Schelling, *Ideas for a Philosophy of Nature*, p 165.

^{xxv} Ibid. Introduction p x.

^b Transcendental idealism was a doctrine of Immanuel Kant's and it proposed that one's experience of things is only how they appear to oneself and not based accurately on what its nature is in and of itself.
^{xxvi} Jan Olof Bengtsson, *The Worldview of Personalism: Origins and Early Development* (Oxford: Oxford University Press, 2006), p 86.

further research is, therefore, this idea of Nature; if we succeed in attaining this, we can also be certain to have dealt satisfactorily with that problem^{xxvii}.

It is interesting to see here that Schelling essentially wishes to solve Nature, as if it were an equation. This is a concept that was far from the primary concerns of most scientists and this continues to be the situation.

Schelling, like those who would follow him, immediately displays his respect and admiration for experimental research. In his *Ideas For A Philosophy of Nature*, the first part examines in great depth many questions relating to the natural sciences, such as chemistry and physics. One of the arguments he makes throughout is that the mind has an originary power- a positive power of thought that extended unrestrictedly outward. While this type of thinking was similar to Fichte, he decided to advance this by arguing that the passive, restricting power also present was an essential produce of the mind itself: the subsequent limitation resulted from the absolute ego's coming to know itself^{xxviii}. For Schelling, the natural world as well as an individual's ego came about to exist because of two separate parts of the mind interacting: the creative power that was infinitely expanding, and the constricting, formative power that gave determination to the primary power. It is because of this that any and all experience of the material world is hermeneutically sealed within the infinite mind. "No objective existence is possible without some mind that recognizes it; and, conversely, no mind is possible without a world existing for it^{xxix}". This theory of the self-creating intellectual intuition was revolutionary in every way possible. For Schelling, nature and the empirical self develop

^{xxvii} Schelling, *Ideas For a Philosophy of Nature*, p 42.

^{xxviii} Richards, *The Romantic Conception of Life*, p 131.

^{xxix} Ibid. p 132, taken from Schelling's *Ideas For a Philosophy of Nature*.

tangentially and in mutual dependence upon one another. It is because of this that, as mentioned previously, the exploration of nature can help an individual to better understand his inner being.

One goal Schelling had in this mode of thought was to demonstrate that specific causal sequences, which Immanuel Kant assumed had to be due to things-in-themselves, were also the free, if hidden, decisions of the absolute ego^{xxx}. And it is in trying to solve this that we see the large difference between Schelling and Goethe: Schelling approached the problem of a priori demonstration not from the perspective of nature, but from that of the ego itself.

While Schelling focused more on the philosophical aspect than Goethe may have, he did respect the work of the scientist. Naturphilosophie was not to replace empirical science, for he maintained that the heart of natural science was the experiment, in which: “nature is forced to respond under determinate conditions, which usually do not exist in her or which must be arranged by others in order to exist^{xxxii}”. He held that all knowledge, not just that of natural science, must be gained initially through experience. Much to Goethe’s joy, Schelling claimed that: “originally we generally know nothing except through experience and by means of experience, and in this respect all of our knowledge consists of experience^{xxxii}”. It is this accumulation of knowledge that becomes the never-ending task of natural science. His end goal was to show that natural science could be augmented by Naturphilosophie to become an objective, autonomous discipline,

^{xxx} Ibid. p 136.

^{xxxii} Ibid. p 141.

^{xxxii} Ibid. p 142.

dependent neither on theology nor transcendental philosophy to establish its foundational principles.

JOHANN WOLFGANG VON GOETHE

Another extremely important figure to discuss is Johann Wolfgang von Goethe. He is instrumental to practically any discussion of intellectual, political, scientific, or artistic focus in the eighteenth and nineteenth century. He is a peculiar character in many ways, largely due to his span of interests and specialties. The unfortunate thing about Goethe is that many people do not see him as a scientist, but only because they do not know of his efforts in this discipline. The public perception of him as a poet primarily was grossly misunderstood according to himself, as Daniel Steuer elicits for his readers: “This public perception ignored the fact that he diligently cared, with great attention, for nature in all its physical and organic manifestations, and pursued his serious reflections continuously and with compassion^{xxxiii}”.

Part of the reason he is not seen as a scientist primarily is because he enjoyed such success in literature as well as poetry. His Bildungsroman^c *Wilhelm Meister’s Apprenticeship* and his two-part drama entitled *Faust* often receive more recognition. Beyond that, his semi-autobiographical epistolary novel, *The Sorrows of Young Werther*, came to be the focus piece of an entire movement, the Sturm und Drang. And this does

^{xxxiii} Daniel Steuer, “In Defence of Experience: Goethe’s Natural Investigations and Scientific Culture,” in *The Cambridge Companion to Goethe*, ed. Lesley Sharpe (Cambridge: Cambridge University Press, 2002), p 161.

^c A Bildungsroman is a form of novel that focuses on the spiritual, social, or psychological development of the protagonist. Goethe’s *Wilhelm Meister’s Apprenticeship* is the paragon of the genre, but others would include James Joyce’s *Portrait of the Artist as a Young Man* or Jean-Jacques Rousseau’s *Emile*.

not even consider that he was an accomplished poet from his childhood until his death.

Goethe is interesting because he is somewhat of an anomaly when it comes to whether or not he is a romantic. Generally he was much more obliged to call himself classical, as he referred to classical as “healthy” and romantic as “sick”, but he admits that Schiller was able to convince him that he was in fact a Romantic^{xxxiv}, contrary to his will. He certainly demonstrated a number of traits similar to those of the romantics, and they permeated his writing. In *Faust*, he writes: “All theories, dear friend, are gray; the golden tree of life is green^{xxxv}”. For Goethe, imaginative poets had more insight into life than a philosopher who spent his time analyzing every aspect of life. His poetry rings out in the same manner, as he writes in his “Roman Elegies”: “Often too in her arms I’ve lain composing a poem, gently with fingering hand count the hexameter’s beat out on her back^{xxxvi}”. This quote may be the perfect fusion of thought and feeling, and describes Goethe perfectly, as he was involved both in the scientific and the romantic. His fictional character, Werther, who is arguably Goethe’s passionately romantic alter ego, searched for his creative self in experiences of nature.

One might wonder how Goethe could actually be a true scientist and yet still contribute to naturphilosophie. This is an excellent point that must be discussed in detail. As I have mentioned, nature philosophers were not opposed to science in the least. Instead, they advocated the expansion of scientific understanding. They wanted it to

^{xxxiv} Richards, *The Romantic Conception of Life*, p 3.

^{xxxv} Johann Wolfgang von Goethe, *Faust I & II*, vol. 2, *Goethe: The Collected Works in 12 Volumes* (Princeton: Princeton University Press, 1984), p 52, lines 2039-2040.

^{xxxvi} Johann Wolfgang von Goethe, *Selected Poems*, vol. 1, *Goethe: The Collected Works in 12 Volumes* (Princeton: Princeton University Press, 1984), p 107.

reach deeper and higher; they did not call for a rejection of science, but instead, a transformation. As David Seamon and Arthur Zajonc make evident in *Goethe's Way of Science*, while Goethe and the other nature philosophers shared a disenchantment with orthodox science, the methods they used to address this differed greatly^{xxxvii}. Goethe's way of science was gained mostly through the use of empirical research, while the pure nature philosophers approached science from a German idealistic philosophy angle. Goethe, on the whole, did not concern himself with practicing the transcendental philosophy that was common of nature philosophy. There are plenty of examples of people who attached themselves with Naturphilosophie, and yet, can hardly be taken seriously. For all that Johann Georg Hamann did in the realm of philosophy, much of what he preached has to be hard thought-upon due to his lack of a scientific background.

Goethe clearly saw the importance of both science and philosophy, as he states in his *Theory of Colours*:

The investigator of nature cannot be required to be a philosopher, but it is expected that he should so far have attained the habit of philosophizing, as to distinguish himself essentially from the world, in order to associate himself with it again in a higher sense. He should form to himself a method in accordance with observation, but he should take heed not to reduce observation to mere notion, to substitute words for this notion, and to use and deal with these words as if they were things^{xxxviii}.

However, he felt that it was important for the scientist to begin with observation and make sure not to replace any of the observations with mere abstractions.

We have discussed how those of the Enlightenment sought to use rationalism as an explanation for everything, and this has led us to discuss how the romantics began to

^{xxxvii} Arthur Zajonc, "Goethe and the Science of His Time: An Historical Approach," p 18.

^{xxxviii} Johann Wolfgang von Goethe, *Theory of Colours* (Cambridge, Massachusetts: The MIT Press, 1970), p 283.

see the world outside of a rational light. But this does not mean that rationalism was rejected outright, at least for all of the nature philosophers. As far as Goethe is concerned, he valued both the empirical and the rational aspects of science. “He sought to bring the rational element consciously into science, but not as an autonomous activity operating upon observation. Rather, he endeavored to imbue seeing itself with the rational^{xxxix}”. What differentiates Goethe in many ways is that he would advocate not for explanations of phenomena in any usual sense, but instead one should try to relive the experiences and experiments so that they can have the insight. He cares not solely for causes but for the understanding of the phenomenon as a whole. He stood in direct contrast to the scientific thought of his day in that he refused to reduce phenomena to a schema, but instead, remained inwardly mobile. By doing this, Goethe allowed himself to cultivate as many modes of representation as possible; or better, he allowed himself to cultivate the mode of representation that the phenomena themselves demanded^{xl}. Much like his fictional writing, Goethe stresses the theme of human development, or *Bildung*, in his scientific research.

Goethe differentiated from many scientists, including Newton, and this becomes fairly obvious when investigating both of their theories of color. Goethe’s approach was incredibly different from that of Newton, as he attempted to develop a physics of color which was based on everyday experience. “He worked to achieve an authentic wholeness by dwelling in the phenomenon instead of replacing it with a mathematical

^{xxxix} Arthur Zajonc, “Goethe and the Science of His Time: An Historical Approach,” p 24.

^{xl} Frederick Amrine, “The Metamorphosis of the Scientist,” in *Goethe’s Way of Science*, p 38.

representation^{xli}”. He argued that Newton had taken something simple, and instead of just using a simple and logical rationale, he had made it a much more complex situation than it needed to be. This is a fairly common argument for Goethe, as he honestly tried to approach a stronger scientific understanding in as simple a fashion as he knew.

Above all, it is his desire to entertain the answers to the same universal questions that Schiller asked that puts him in the discussion of the Naturphilosophe. It may never have been the focus point of his work, but he certainly left his impact on it. He was impacted quite heavily by this type of thinking throughout his life, and this showed its face in both his literary and scientific career. Science was a life-long endeavor that did not stop in the laboratory; it continued as you were walking down the street, making observations about daily life. As much as he may disagree, he was and will continue to be identified with the Romantic period, if for no other reason than for the content of his writings. He never even entertained it as an option to separate the creativity out of his scientific endeavors; for Goethe, they were one and the same. How could one be a scientist without being creative? He allowed the poet in him to infiltrate his scientific writings and experiments, science could not stay away from his poetry, and they both met in the middle in his fictional writings.

IMPORTANCE OF PIETISM

Throughout the eighteenth century there was an almost irreconcilable conflict between: “the German Enlightenment philosophy with its deistic trends on the one hand,

^{xli} Henri Bortoft, *The Wholeness of Nature: Goethe’s Way Toward a Science of Conscious Participation in Nature* (Hudson, New York: Lindisfarne Press, 1996), p 19.

and the Pietistic movement with its emphasis on personal divine illumination^{xlii}.” There was consistently a discord between the two movements in their respective concepts of God. While the rationalists relied on reason in order to construct their sense of moral responsibility, the Pietists found the answer to these philosophical questions in divine revelation.

Pietism was a religious phenomenon that occurred first in Germany and was mainly prominent in the middle and lower middle class^{xliii}. Reason was a concept that was extremely important to the Pietists. For them, human reason had been covered in darkness because of the fall of man, and it could only be revealed by divine illumination^{xliv}; man by himself could do nothing to enlighten himself.

One characteristic of Pietism was the advocacy of conversion over religious rituals and creed. This was because the adherents to Pietism were fleeing, in their minds, overly dogmatic religions to begin with. They focused on the spiritual growth of the individual: “As a general policy Spener called upon preachers as well as teachers and other laymen to promote the spiritual regeneration of the individual and to foster the moral reform of the church and the university^{xlv}.” Philipp Jakob Spener (1635-1705) was a German theologian based out of Frankfurt mainly and was known as “the father of Pietism”. The rejection of any sort of organizational, unifying structure or obligatory

^{xlii} Friedhelm Radandt, *From Baroque to Storm and Stress 1720-1775* (London: Harper & Row Publishers, Inc, 1977), p 13.

^{xliii} Larry Vaughan, *The Historical Constellation of the Sturm und Drang* (New York: Peter Lang Publishing, Inc., 1985), p 100.

^{xliv} Radandt, *From Baroque to Storm and Stress*, p 13.

^{xlv} Vaughan, *The Historical Constellation of the Sturm und Drang*, p 87.

dogma was founded in the Pietists' spiritualism^{xlvi}.

Pietism did not stop at just having the obvious religious impact. It also was the prime reason behind the formation of a literary public in Germany^{xlvii}, among other reasons. The use of devotional literature increased as pastors pushed their congregations to practice reading them. It is interesting to note that many of the popular authors of the Sturm und Drang movement were raised in pious Protestant homes^{xlviii}, if not pietistic ones, such as Klopstock and Lessing. In trying to find religious meaning in everyday life, the Pietists were part of the process of secularization in Germany because they took religious feeling away from the church. It was no longer a unique experience. At the same time they gave everyday experiences the intensity and the transcendental meaningfulness that had previously been the exclusive province of religion^{xlix}.

There was quite a contrast in styles between the German pietistic parsons and their English counterparts. According to Larry Vaughan: “[they] went beyond the essayist-rationalist sermonizing of their English counterparts and reached into the depths of spiritual-mystical emoting...and thus tuned the social-cultural heartstrings of individuals to the fervent pitch which resonated to the deep chords of Sturm und Drang¹.”

The end result of the German pietist movement was an intense inner life resulting in a large amount of moving but highly personal and violently emotional literature. This

^{xlvi} Hans Schneider, *German Radical Pietism* (Lanham, Maryland: Scarecrow Press, Inc, 2007), p 60.

^{xlvii} Vaughan, *The Historical Constellation of the Sturm und Drang*, p 98.

^{xlviii} *Ibid.* p 108.

^{xlix} David Hill, ed. *Literature of the Sturm und Drang* (Rochester: Camden House, 2003), p 6.

¹ Vaughan, *The Historical Constellation of the Sturm und Drang*, p 114.

literature demonstrated their hatred for the intellect. The pietists did not outright reject discussions of an intellectual nature, or even sound doctrine, but they felt that it first and foremost must promote the Christian life. Spener especially thought that the German theologians of the seventeenth century had reduced theology to a philosophy. “That Protestant theology had become head knowledge rather than heart knowledge was a major pietistic concern^{li}”.

When Pietism was first noted in this paper, it was mentioned that Pietism was a branch of Lutheranism. I feel that it is important to note that the two were similar in a number of ways. It is not as though Pietism was an entirely new creation, radically different from anything that preceded it. In fact, a number of “pietists” actually belonged to the Lutheran church, such as Johann Arndt. Orthodox Lutheranism was much more interested in the inner life of each person than it is often given credit, and it never lost this piety, even into the seventeenth and eighteenth centuries as it continued to undergo changes^{lii}. Luther himself, was quite pious in his own right. However, Spener stressed such an introspective pietism that we can see that Luther would have differed in some parts. For Spener, even those who had been born again were constantly being encouraged to reexamine themselves to be sure that they were in fact, born again^{liii}. This was very similar to the late medieval pietism that Luther had been trying to avoid.

As mentioned earlier, a number of thinkers that had an impact during the period

^{li} Hughes Oliphant Old, *Moderatism, Pietism, and Awakening*, Volume 5, *The Reading and Preaching of the Scriptures in the Worship of the Christian Church* (Grand Rapids: Michigan: William B. Eerdmans Publishing Company, 2004), p 72.

^{lii} *Ibid.* p 71.

^{liii} *Ibid.* p 83.

of the Enlightenment and into the Romantic were raised in pietistic homes. Among them would be Johann Georg Hamann, the German philosopher who is often attributed with the formation of the counter-Enlightenment movement. Hamann was very impressed by the works of David Hume, and one of the areas that Hamann focused on was that tradition is the accumulation of past beliefs, while revelation is the appearance of God through nature, or through Holy Writ^{liv}. Hamann felt that many of the conclusions of the natural sciences actually restricted God and the infinite possibilities of his creation. He hated everything about dualistic teachings and his entire conception of Christian society rested on an extremely passionate belief that man is one and that if God not only exists but enters into every fiber of human experience, then confining him to his specific sphere is a blasphemy. What makes Hamann a Pietist above all is his belief in a personal God. He believed that in the Bible, God spoke directly to mankind; it was not some abstraction for certain people to interpret, but instead, a personal message to each person. The personal emotionalism that was evident in Hamann's life is representative of the Pietist Lutheran faith that is being discussed, and this leads in to how Pietism especially was influenced by the *romantische Naturphilosophie*.

The Romantics as a whole were a group of individuals who stressed the emotional over the rational. Both the Romantics and the Pietists were fighting very similar battles, as the Romantics fought against rational justifications for the universe and the Pietists fought against the unjustly dogmatic religions present at the time. Much like the rationalists killed nature by their denial of the senses and the passions, the dogmatic brand of religion had destroyed the sense of an individualistic and personal relationship

^{liv} Isaiah Berlin, *The Magus of the North: J.G. Hamann and the Origins of Modern Irrationalism* (London: John Murray, 1993), p 34.

with God. Isaiah Berlin describes the doctrine of the German Protestant in the eighteenth century: “according to whom the sacred history of the Jews is not merely an account of how that nation was guided from darkness to light by God’s almighty hand, but is a timeless allegory of the inner history of the soul of each individual man^{lv}”. One can see that the religious experience was not something to take lightly for the pietist Lutherans. This quote also depicts the experience of the Naturphilosophen, as he is brought to a greater understanding of the world by way of an increased knowledge of nature.

IMPACT OF NATURPHILOSOPHE

While Naturphilosophie may not have been the most impressive movement at the time, this certainly does not mean that it was entirely worthless. Much of what was said and taught laid the foundation for scientific thought and advancement in the future.

Timothy Lenoir says this about Naturphilosophie: “the fact that the Naturphilosophen proposed an organic approach to the entire spectrum of natural sciences and emphasized the importance of a unitary, historical conception of nature lent further credence to the view that Naturphilosophie provided the model for unifying the life sciences sought by German biologists in the pre-Darwinian period^{lvi}”.

Even now there is much to be done in the field of Naturphilosophie, especially in English. Lenoir admits in his introduction that very few historians have even made a small attempt at coming to an understanding of teleological explanation. In addition, he

^{lv} Ibid. p 15.

^{lvi} Timothy Lenoir, *The Strategy of Life: Teleology and Mechanics in Nineteenth Century German Biology* (Dordrecht, Holland: D. Reidel Publishing Company, 1982), p 5.

states that there has been an assumption in the case of German biology that: “the main impetus for the development of biological thought came from a monolithic, idealist philosophy of nature known as *romantische Naturphilosophie*^{lvii}”. People who do not have any attachment to the Romantic period and its successes view Naturphilosophie as a scientific loser that did not result in any concrete scientific findings. At best, it was a feeble attempt by second-rate scientists to rationalize the universe in an anti-rationalist manner.

Many historians of science have urged for more focus in this area, as Frederick Gregory explains: “a more comprehensive account of science in history must recognize the nonpermanent nature of scientific theory and its susceptibility to factors external to its rational structure^{lviii}”. Previously, most people have assumed that science was to answer “How?” and religion was to answer “Why?” and there was to be no interchanging of roles whatsoever. But this is not what the Naturphilosophen hoped at all. They sought answer to both questions, and although they were often rejected, this type of thinking has begun a resurgence. Prominent figures in numerous fields, including physics and biology are currently advocating for an overhaul on the methods of investigation that are used. For instance, Arthur Zajonc argues for one such change: “Are there, however, objects whose nature is so radically nonmechanical that they defy all honest attempts to include them in the catalog of machines? I am convinced there are many, but none is so unambiguously nonmechanical as light^{lix}”. Some may say that it is not that big of a deal

^{lvii} Ibid. p 3.

^{lviii} Frederick Gregory, *Nature Lost?: Natural Science and the German Theological Traditions of the Nineteenth Century* (Cambridge, Massachusetts: Harvard University Press, 1992), p 263.

^{lix} Arthur Zajonc, “Light and Cognition: Goethean Studies as a Science of the Future” in *Goethe’s Way of*

because one would have to look far to find a phenomenon that cannot be embraced within the mechanical universe. But according to Zajonc, incidences that include these “rare” phenomena are multiplying rapidly, and soon they will require serious attention of responsible individuals.

Zajonc, and others like him, find a certain amount of worth in men like Goethe, and find that their work still has some relevance, perhaps more now than ever. Of course, Goethe’s *Theory of Colours* has been disproved on a number of levels, but what Zajonc finds most intriguing is his methods of investigation. Immanuel Kant thought that science without mathematics is not science at all, and many people would agree with him. But by restricting science in such a way, one restricts the possible answers and outcomes. For Goethe, this prevents one from falling into an abstract, mathematical representation of phenomena. Also, one is able to address the conditions under which the phenomenon appears, and not just the causes of it. Goethe, as he does so often, describes this situation perfectly by saying: “The ultimate goal would be: to grasp that everything in the realm of fact is already theory. The blue of the sky shows us the basic law of chromatics. Let us not seek for something behind the phenomena - they themselves are the theory^{lx}”.

The current environmental situation throughout the world and its implications certainly suggests that the way mankind does science should be adjusted. Gregory says: “in the face of the ecological crisis in the radical separation of science from religion appears to be an intellectual luxury the human race can no longer afford to retain^{lxi}”. Of

Science, p 304.

^{lx} Johann Wolfgang von Goethe, “Empirical Observation and Science” (January 15, 1798), in *Goethe: Scientific Studies*, ed. & translated by Douglas Miller (Boston: Suhrkamp Publishers, 1988), p 24-25.

^{lxi} Gregory, *Nature Lost?*, p 264.

course, Gregory, nor many others, are able to explain just what this radical change is. In fact, it may not be that radical at all. Perhaps it is only a slight adjustment in the way we prioritize our thinking. Maybe it is a change towards the humane science that was representative of the type of science that Goethe strove towards. As Emerson so eloquently put it: “And never did any science originate but by a poetic perception.”^{lxii}

^{lxii} R. W. Emerson, *The Complete Works of Ralph Waldo Emerson*, vol. 10 (Boston: Riverside Press, 1903-1904), p 217-218.

Bibliography

- Bengtsson, Jan Olof. *The Worldview of Personalism: Origins and Early Development*. Oxford: Oxford University Press, 2006.
- Berlin, Isaiah. *The Magus of the North: J.G. Hamann and the Origins of Modern Irrationalism*. London: John Murray, 1993.
- *The Roots of Romanticism*. Princeton: Princeton University Press, 1999.
- Blake, William. *The Complete Poetry and Prose of William Blake*. Berkeley, California: University of California Press, 1982.
- Bortoft, Henri. *The Wholeness of Nature: Goethe's Way Toward a Science of Conscious Participation in Nature*. Hudson, New York: Lindisfarne Press, 1996.
- d'Alembert, Jean Le Rond. *Preliminary Discourse to the Encyclopedia of Diderot*. Chicago: University of Chicago Press, 1995.
- Darwin, Charles. *On the Origin of Species*. London: Murray, 1859.
- Emerson, Ralph Waldo. *The Complete Works of Ralph Waldo Emerson*. Volume 10. Boston: Riverside Press, 1903-1904.
- Goethe, Johann Wolfgang von, *Faust I & II*. Vol. 2, *Goethe: The Collected Works in 12 Volumes*. Princeton: Princeton University Press, 1984.
- *Scientific Studies*. Ed. & translated by Douglas Miller. Boston: Suhrkamp Publishers, 1982.
- *Selected Poems*. Vol. 2. *Goethe: The Collected Works in 12 Volumes*. Princeton: Princeton University Press, 1984.
- *Theory of Colours*. Cambridge, Massachusetts: The MIT Press, 1970.
- Gregory, Frederick. *Nature Lost?: Natural Science and the German Theological Traditions of the Nineteenth Century*. Cambridge, Massachusetts: Harvard University Press, 1992.
- Hegel, Georg Wilhelm Friedrich. *The Philosophy of Nature*. Kessinger Publishings, <http://www.kessinger.net>
- Hill, David, ed. *Literature of the Sturm und Drang*. Rochester: Camden House, 2003.
- Lenoir, Timothy. *The Strategy of Life: Teleology and Mechanics in Nineteenth Century German Biology*. Dordrecht, Holland: D. Reidel Publishing Company, 1982.

- Old, Hughes Oliphant. *Moderatism, Pietism, and Awakening, Volume 5, The Reading and Preaching of the Scriptures in the Worship of the Christian Church*. Grand Rapids, Michigan: William B. Eerdmans Publishing Company, 2004.
- Perry, Marvin, Myrna Chase, James R. Jacob, Margaret C. Jacob, and Theodore H. Von Laue. *Western Civilization: Ideas, Politics, and Society From the 1400s*. Boston: Houghton Mifflin Company, 1989.
- Radandt, Friedhelm. *From Baroque to Storm and Stress 1720-1775*. London: Harper & Row Publishers, Inc, 1977.
- Richards, Robert J. *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe*. Chicago: University of Chicago Press, 2002.
- Schelling, Friedrich Wilhelm Joseph von. *Ideas for a Philosophy of Nature*. Cambridge: Cambridge University Press, 1988.
- Schneider, Hans. *German Radical Pietism*. Lanham, Maryland: Scarecrow Press, Inc, 2007.
- Seamon, David and Arthur Zajonc. *Goethe's Way of Science*. Albany: State University of New York Press, 1998.
- Sharpe, Lesley, ed. *The Cambridge Companion to Goethe*. Cambridge: Cambridge University Press, 2002.
- Vaughan, Larry. *The Historical Constellation of the Sturm und Drang*. New York: Peter Lang Publishing, Inc., 1985.