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Goethe's Platonic Natural Philosophy: How Goethean Science Provides an Alternative Conception of the Cosmos

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Abstract: While popularly known for his works of literature and poetry, Johann Wolfgang von Goethe viewed his lesser-known scientific pieces as his most enduring achievement. I will argue that Goethe's unique scientific methodology is informed by a metaphysical commitment to a form of Platonism and that Goethe provides an intriguing alternative paradigm that unifies science, philosophy, theology, and ethics. I begin by demonstrating how Goethe's concept of the *Urphänomen* offers a Platonic conception of natural beings. I then briefly outline how this alternative scientific approach ultimately derives from his Platonic commitments. Next, I demonstrate the ethical and spiritual implications of Goethean science, establishing that Goethe's approach bridges the divide between our scientific endeavors and spiritual formation. There is, then, a continued relevance for Goethe in conversations regarding ecological ethics and our perception of nature.

Keywords: Goethe; Platonism; science; romanticism; natural philosophy; nature; ethics

1. Introduction

While far more celebrated for his literary achievements, Johann Wolfgang von Goethe (1749–1832) was also an active scientist, pioneering the field of comparative morphology and often credited as the co-discoverer of the human intermaxillary bone.¹ Indeed, Goethe viewed his scientific work as his most enduring achievement (Seamon 1998, p. 1), and the sheer diversity and depth of Goethe's reach into two seemingly disparate fields led D. R. Oldroyd to declare him “an extraordinary amalgam of poet and scientist, a man of truly universal genius and attainments” (Oldroyd 1980, p. 51). Yet the scientific method Goethe employed would not be recognizable to a contemporary scientist. Indeed, Goethe's peculiar methodology results from his rejection of what he perceived as the failures of the reductionistic, abstractive, and purely quantitative tendencies of his contemporaries. Moreover, it emerges from his own philosophical and theological commitments—commitments that belong squarely within the Platonic tradition. While much has been written on the interaction (both positive and negative) between Goethe and modern philosophers like Kant, Schelling, and Spinoza, less attention has been given to the Platonic tradition, especially with regard to Goethe's scientific work.² Moreover, while Platonism certainly had its impact on many scientific figures, Goethe's particular incorporation of these ideas separates him from his contemporaries. Thus, I will argue that Goethe's scientific methodology is informed by a metaphysical commitment to a form of Platonism and that it provides an intriguing alternative paradigm that unifies science, philosophy, theology, and ethics.

I will begin by outlining Goethe's unique theological and metaphysical views in order to justifiably locate him as a Platonic thinker. This will likewise provide the basis for a description of his alternative scientific program and the epistemological framework from which it arises. This paper will conclude with Goethe's effort to tie an ethical dimension into his work, maintaining that his practice resulted in a higher development of the human subject and culminates in universal love. This sketch of Goethe's unique theological, scientific, and ethical program will demonstrate his relevance for future conversations on the significance and fruitfulness of his particular Platonic framework for religious and scientific life.



Citation: Hart, Seth P.. 2024. Goethe's Platonic Natural Philosophy: How Goethean Science Provides an Alternative Conception of the Cosmos. *Religions* 15: 355. <https://doi.org/10.3390/rel15030355>

Academic Editor: Alexander J. B. Hampton

Received: 25 January 2024

Revised: 7 March 2024

Accepted: 14 March 2024

Published: 17 March 2024



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2. Goethe: A Platonist?

What impact did Plato and Platonism have on Goethe's writings? Certainly, Goethe inhabited an intellectual milieu where Platonism was significant. Goethe's connections with Fichte, Schleiermacher, Hegel, Schelling, and other great philosophers and scientists are well documented, and their thoughts (including aspects impacted by Platonism) would have certainly influenced Goethe's own (and vice versa). Indeed, to cite just one example, Hegel praised Goethe's ideas precisely for their resonance with Platonism, for in them, "Two worlds greet each other: our abstruse world and the world of phenomenal being [*Dasein*]" (Hegel 1984, p. 699). However, in this section, I will focus solely on the internal evidence from Goethe's own writings. And, indeed, Goethe often spoke glowingly about Plato. To give one instance, he described the ancient philosopher as a "beautiful spirit" who had "penetrat[e] to the depths" of the world, "soar[ed] to its heights, full of longing to return to his source." He further asserts that Plato's "every utterance is imbued with an awareness of what is eternally whole, good, true, and beautiful" (Goethe 1949, p. 233).

Yet establishing such conceptual dependence does not solely depend on such references. One sees in Goethe a strong congruence between his own theology and that of the Platonic tradition. For instance, Goethe affirms that there is a divine pattern through which nature is created. He writes, "Behind every creature is a higher idea. That is my God; that is the God we all eternally seek and hope to see, but we can only conjecture—not see. I ask not if this Highest Being *has* Understanding or Reason, but I feel it *is* Understanding—it *is* Reason itself. All creatures are penetrated by it, and humanity so much of it that it can recognize parts of the Most High" (Goethe 1899, p. 6; emphasis mine).³ He elsewhere states, "The Idea is eternal and unitary . . . All that of which we become aware and of which we can speak are only manifestations of the Idea; concepts we express and in as much as we do so the Idea itself is a concept" (as cited by Zajonc 1987, p. 235). The material world, then, is but a shadowy reflection of the eternal world of ideas.

While one might be tempted to regard Goethe as herein affirming a form of pantheism (as many, historically, have), Goethe elsewhere utilizes traditional language of creation with regard to the physical universe. For example, in the essay "Doubt and Resignation," Goethe asserts, "When we consider the structure of the universe in its fullest expanse and minutest detail we cannot help but think that the whole rests upon an idea which sets the pattern according to which God *creates* and works in nature, and nature in God, throughout all eternity" (Goethe 1988c, p. 33; emphasis mine). From the various phenomena of nature, Goethe believed he could grasp the underlying divine idea uniting them all. It is not the creature itself that is divine but the idea *within* the creature that instigates its various corporeal manifestations. As Arthur Zajonc writes, "Goethe in his studies . . . is seeking his God not so much 'behind the scenes' as *through* or even *within* the scenery of Nature" (Zajonc 1987, p. 237; emphasis mine). However, Goethe never goes so far as to equate God *with* nature. As each of these quotations reveals, underneath the various phenomena of nature, Goethe believed he could grasp the underlying divine idea uniting them all. In other words, Goethe affirmed a form of Platonic theism that saw the divine ideas radiating through creation, though not identifiable with the material manifestation. Further influences from Platonism will be elaborated below, but these short statements are enough to justify the overall Platonic framework of Goethe's philosophy of nature.

3. Goethe's Metaphysics

Given the prominence of words like *concept* and *idea* within his theology, it is necessary to clarify how Goethe understands these terms. To begin, Goethe was highly critical of the scientific enterprise of his day, regarding it as too abstractive, mechanistic, and divorced from its own historical development. These faults not only prevented scientific advancement but achieved an intellectual schema divorced from reality. The material world is mobile, flowing, and synthetic; the scientific conceptualizations of his day, meanwhile, were abstract, static, and analytic. *True* divine ideas are approached only through grasping

reality in all its multifarious forms and arriving at the principle of motion underlying every manifestation.

How, then, did Goethe propose to overcome the problems inherent in his contemporaries' methods? To begin, Goethean science needed to reconnect empirical investigations with a living, dynamic world. Goethe therefore critiqued his German colleagues for their preferential usage of the term *Gestalt* [shape or structured form]—a term which denotes an essentially static form—when, in fact, one's perception of natural beings reveals that “nothing in them is permanent, nothing is at rest or defined—everything is in a flux of continual motion” (Goethe 1988l, p. 63). Consequently, Goethe, in conjunction with Blumenbach (who, in turn, seems inspired by the concept of plastic natures in Cudworth), prefers the term *Bildung* [formation or shaping], which denotes the continuous evolution of the phenomenon. How, then, can Goethe keep from reducing the world to a state of Heraclitan flux? How can a stable ipseity persist through constant alteration?

According to Goethe, this problem only arises if one dichotomizes between change and identity. Goethe therefore proposed an apparently paradoxical proposition that a creature's identity can only be maintained *through* movement and transformation. In an essay called “Nature,” he writes, “There is everlasting life, growth, and movement in [nature] and yet she does not stir from her place” (Goethe 1988e, p. 3). Nature itself is forever in a state of dynamism, yet she never “stirs” in the sense that such motion is merely a further revelation and actualization of nature's form and not an obliteration of it. This dynamic view of form (which stands in contrast to the abstractive, fixed notions of his contemporaries) is the ground of Goethe's alternative scientific project. He writes, “I will go so far as to assert, however, that when an organism manifests itself we cannot grasp the *unity* and freedom of its formative impulse [*Bildungstrieb*] without the concept of *metamorphosis*” (Goethe 1988k, p. 36; emphasis mine). Thus, Goethe argues that a creature's unity always assumes diversity—or what Henri Bortoft has described as “multiplicity in unity” (Bortoft 1996, p. 86). Across this diversity, a series can be formed and understood as a manifestation of a greater whole. Hence, the phenomenon's motion is not a process of chaotic flux but grounded upon an underlying law perceptible to an exact sensorial imagination [*exakte sinnliche Phantasie*].

These underlying laws are guided by what Goethe calls the “two great driving forces in all nature: the concepts of *polarity* and *intensification*” (Goethe 1988a, p. 6). The former, defined as the force of attraction and repulsion, denotes matter *qua* matter while the latter, signifying a proclivity for ascent toward greater perfection, designates spirit *qua* spirit. However, since matter and spirit are perpetually intertwined, the two act continuously in conjunction. Within our world, neither has ontological priority, and each one is the source of the other. This seemingly contradictory conclusion is derived in the following manner. Because spirit and matter are themselves two ends of a polarity, spirit would seem to emerge from matter (matter *qua* polarity, being the underlying principle from whence both arise). Yet, simultaneously, because spirit is the principle of intensification, it must be the intensification *of* something—namely, matter. Hence, paradoxically, matter also seems to have emerged from spirit (Goethe 1988a). How is one to make sense of this? To break this ontological paradox, it seems that one must suppose both are the subsistent creations of the infinite divine principle from which matter derives and toward which finite spirit strives in an upward ascent of creation back towards its supernatural source.

An abridged outline of Goethe's metaphysical principles goes as follows: (1) Matter and spirit are ontologically united yet can still be considered in two different respects with regard to their forces (Portmann 1987, pp. 143–44). (2) The spiritual force concerns intensification while the material force concerns polarity. (3) Natural motion in beings is therefore not unintelligible but guided by a synthesis of these two fundamental forces (Steuer 2002, p. 161). (4) Consequently, polarization (repulsion and attraction) becomes a means of ascent in living creatures. (5) Likewise, ascent effects further differentiation and unification. (6) These distinct natural movements are united by a single, intelligible idea (what Goethe called the *Urphänomen*) which manifests through the multiplicity of the

phenomenon.⁴ The *Urphänomen* was, in turn, identical to the divine idea itself. Goethe himself condenses his perspective as the view that “spirit and matter, soul and body, thought and extension . . . are the necessary twin ingredients of the universe, and will forever be” (Goethe 1952, p. 162).

Through this striving, nature seeks to ascend upward “as on a spiritual ladder” (Goethe 2009b, p. 6) towards higher expressions of its formative idea. For instance, within plants, Goethe observed that transformations occurred through a series of “contraction and expansion by which nature finally attains its goal” (Goethe 2009b, p. 44). All metamorphic processes within plant development were subsumed under these two general movements. Even reproduction fell under this schema and was regarded as, “anastomosis on a spiritual level” (Goethe 2009b, p. 55). Moreover, the usage of his exact sensory imagination revealed that the structures of the plant, however advanced, were the products of a transformation from one fundamental organ or *Urorgan*—namely, the plant leaf, which served as the single formative idea for all plant life.⁵

Thus, Goethe’s research seemed to demonstrate that the structures of the plant, however advanced, were the products of a transformation from one fundamental organ in its efforts to climb the “spiritual ladder.” The flowering plant marvelously revealed the dance of spirit and matter within Goethean metaphysics. Polarities are negotiated in a process of nonidentical repetition,⁶ effecting the spiritual intensification of the organism itself. The very evolution of seed into leaf, calyx, sexual organs, fruit, and finally back to seed was the manifestation of this process.⁷ Thus, each creature, in its own specific way, strives toward its idiosyncratic end—an end determined by the divine idea from which it draws life and toward which its every motion strives.

4. Goethe’s Epistemology and Methodology

The above description of the metaphysics behind Goethean science fails to fully elaborate on his equally unique epistemology and scientific methodology, and it remains to be shown just how Goethe believed one develops this “exact sensory imagination.” To begin, one must first understand Goethe’s most celebrated epistemic innovation—one that would take over a century to gain admiration—which was his concept of the *Vorstellungsart*. Goethe notes that since the categories of understanding act as a “lawgiver” (Goethe 1988f, p. 44) to sensory data, they impose an organizing idea (*Vorstellungsart*) through which the phenomenon is given meaning. Scientific observation is not a passive reception of sensory impressions by a subjective onlooker; rather, the subject actively shapes what is perceived. Observation is, in the later words of N. R. Hanson, theory-laden.

As a result, in the process of interpretation, the observer can easily become deceived by imposing an intellectual structure foreign to the object. Goethe writes, “It is easy to see the risk we run when we try to connect a single bit of evidence with an idea already formed, or use individual experiments to prove some relationship not fully perceptible to the senses but expressed through the creative power of the mind” (Goethe 1988j, pp. 14–15). Goethe here alludes to his scientific nemesis Isaac Newton, whose emphasis upon an experimentum crucis represented the antithesis of Goethe’s own lengthier yet more holistic method.⁸ Failure to heed this caution would result in the entrenchment of certain paradigms within the scientific community—paradigms demanding that all data, whether confirmatory or aberrant, adapt to their strictures. Novel ideas that would account for empirical irregularities are exiled to the margins of science simply due to the historical priority of the dominant theory. Goethe writes, “In the history of science it is important to note that the first stages of a discovery leave their mark on the course of knowledge; they have a lasting effect in hindering its progress, even paralyzing it” (Goethe 1988b, p. 42).

In other words, the interpretation of an original discovery subsequently determines the interpretative framework for that phenomenon. An aspiring scientist who might challenge this accepted opinion may find that “his age lacks the ability to recognize the truth” (Goethe 1988d, p. 47). Nevertheless, when a certain science suddenly fails to bear fruit,⁹ the defects of the accepted paradigm are exposed by the few brave enough to risk

challenging established reason (Goethe 1988m, p. 53). This new paradigm is not itself a new piece of empirical data but a distinct “way of seeing” the existing evidence.

In contrast to conventional scientific wisdom that envisions science as progressing purely through empirical research, scientific breakthroughs largely result via nonempirical means. Thus, in a voice strikingly prophetic of Thomas Kuhn and N. R. Hanson, Goethe concludes, “The greatest discoveries are made not so much by men as by the age” (Goethe 1988j, p. 13). While discoveries are, of course, brought about by persons, they are only received by the scientific community once a shift has occurred in its collective *Vorstellungsart*. Thus, contrary to science’s own mythology, scientific discoveries are not simply the byproducts of experimentation and objective “facts”; rather, science is a discipline married to historical and social contingencies, and a consistent failure to recognize this feature of scientific “discovery” has repeatedly resulted in an impediment to its progress. How, then, does one overcome this epistemic hazard? The answer lies, unsurprisingly, with a methodology grounded in the *Urphänomen*. If one can grasp this underlying concept, one uncovers not only the phenomenon in all its aspects but also the divine idea that serves as its principle. It is a discovery at once scientific and theological. How, then, is such a methodology to work?

In one of his many aphorisms, Goethe dubs his unique methodology a “delicate empiricism” that “makes itself utterly identical with the object, thereby becoming true theory” (Goethe 1988g, p. 307). This seemingly simple statement has layers of depth which require unpacking. To begin, Goethe’s own form of empiricism is “delicate” in that, as opposed to the intrusive experimental methods of his contemporaries who treated matter in a domineering way, Goethe’s methodology refused to interpret natural objects as purely mechanical devices whose purpose is our own gratification (Martin 2015, chp. 4).

As such, alien modes of thinking are not projected onto nature; rather, the observer leaves the phenomenon unchanged. Goethe therefore repudiates his fellow scientists for reducing phenomena to their purely quantitative aspects, such as optical science’s conversion of colors into degrees of refrangibility. The qualitative must be given a place within science. Another way of summarizing the distinction here is that while Newtonian science and the practice that followed from it was concerned with *representations*, Goethean science remains in the presentation. Thus, as Bortoft notes, Goethe’s way of science is “one of dwelling in the phenomenon” (Bortoft 1996, p. 22) so that the “phenomenon becomes its own language” (Bortoft 1996, p. 74). Goethe’s approach can thus be called a phenomenology of nature and has even been tied to the formation of the field of phenomenology itself.¹⁰

Here, again, the Platonic roots of his methodology are evident. In Plato’s famed analogy of the cave, the highest form of life—the one succeeding in its escape from the shadowy realm of illusion—is defined as a life in the “pure sunlight [of] a perpetual *Wesenschau* or contemplation of Platonic Ideas” (Rosen 2005, p. 272). This act itself results in what Lloyd Gerson calls cognitive identification with the forms, which he defines as “the self-reflexive awareness of one’s cognitive state” (Gerson 2005, p. 216). In other words, one does not know the form via some relationship but immediately in the act of cognition.

For example, when one seeks to know justice, one does not wish to know it in one particular circumstance but to know it as it is in itself, outside of all relation. One desires a cognitive “unity” that erases all distance between the thought and the thing thought. Consequently, desire for knowledge and desire for unity merge in Plato’s thought. As D. C. Schindler notes, “Love and reason thus essentially coincide, insofar as both entail an identification of the self with its object in some respect” (Schindler 2008, p. 134). Thus, for both Plato and Goethe, the goal of investigation is identification with the object—namely, with the object’s form or *Urphänomen* lying behind and beyond any particular manifestation.

Additionally, Goethe divides one’s encounter with phenomena into three ascending stages of discovery.¹¹ The first stage, named the “empirical phenomenon,” is the basic level of encounter every observer has of a given thing. Through research, this initial perception can be raised to the level of the “scientific phenomenon,” whereby a given effect is reproduced in a sequential series of experiments in order to ascertain the exact

conditions needed for its appearance. Finally, the *Urphänomen* will emerge at the end of all experimentation in the sensory imagination, revealing the archetypal wholeness behind the object of experience. As in the great allegory, one ascends beyond the realm of shadowy motions, out of the cave of ignorance, and into the divine light. To arrive at this last stage, however, the experimenter must move from one experiment to the next adjacent one, exploring the phenomenon in a manifold of contexts. Only then can the archetype appear not as a concept but as the sensory whole that unites the entirety of the various contexts.

An imprecise but illuminating illustration would be the famous artwork *The March of Progress* by Rudolph Zallinger. In this piece (one that can be found in many, if not most, natural history museums or science classrooms), hominid evolution is aligned in a single-file row in order to demonstrate the gradual movement from ancestral apes to modern humans. Each succeeding step of evolution is placed next to the preceding stage so that the “movement” of evolution can be intuited by the observer. One imagines it as a seamless transition between the disparate figures despite no such transition taking place within the artwork itself. As such, while each figure stands alone, any keen spectator would be able to imagine how another intermediate figure between any two figures in the painting might appear. Simultaneously, no single figure reveals the evolution of humanity; rather, only together and within the context of the whole does the movement become clear. In other words, the “movement” of human evolution is clear in *all* its steps once one grasps the underlying principle discernable through an examination of many instances. The discovery of this hidden logic behind the evolution of humanity would be an exercise of Goethe’s exact sensory imagination, and what can be applied to this painting also pertains to all of nature in her various forms—not just to evolution but also to growth, development, and a myriad of other applications.

Returning to Goethe’s statement on delicate empiricism, he noted that his method required the subject becoming “utterly identical with the object.” In other words, since the discovery of the *Urphänomen* requires human imagination (here, again, the “exact imagination”), Goethe regards the experimenter herself as the “greatest and most precise physical apparatus that can exist” (as cited by Altner 1987, p. 342) since only a person can become identical with the object—namely, the divine idea that represents the highest actualization of the phenomenon. The human mind can, in essence, replicate the divine in this act of observation and study.

Goethe further reveals his indebtedness to the Platonist tradition here. Adapting a line from Plotinus, Goethe writes, “Were eyes, like sun, not luminous, No sunlight could they ever capture; If God’s own power and strength were not in us, How could divine things give us rapture?” (Goethe 1957, p. 113)¹². Physical measuring devices might aid in discovery but cannot replace the role the subject has in contributing to the disclosure of the phenomenon. As such, his statement was not a rejection of experimental instruments; rather, Goethe is challenging the tendency to reduce natural knowledge to what can be garnered from an artificial apparatus. The recognition and understanding of a given phenomenon in all its variation, possibility, and limitation are accomplished only by the human person with a sufficiently developed imagination.

The final phrase of Goethe’s statement on delicate empiricism stipulates that this procedure will result in “true theory.” Goethe returns to this idea in one of his maxims, stating, “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” (Goethe 1988g, p. 307). This rather idiosyncratic usage of the term *theory* might strike contemporary ears as odd, but as Bortoft explains, “The theory is an experience of insight in which what is seen is the intrinsic necessity, and hence the intelligibility, of the phenomenon” (Bortoft 1996, p. 228). Said differently, a phenomenon becomes a theory when the observer’s *Vorstellungsart* aligns with the object itself rather than imposing itself upon it. The phenomenon is then revealed to the investigator in such a way that her thinking becomes identical with the object of experience in its fullest sense and, consequently, with the divine idea. Thus, once the

observer has encountered the *Urphänomen*, there is nothing further behind it to discover; the *Urphänomen* itself explains all the singular manifestations stemming from it.¹³ It is this “wholeness” which, while fully present in every manifestation, is not exhausted in any single instance.

Hence, Goethe, whose fondness for paradoxical yet illuminating statements should by now be evident, can state, “What is the universal? The individual case. What is the particular? A million cases” (as cited by von Weizsäcker 1987, p. 122). In other words, a plant is only seen *as* a plant when one sees *the* plant in their experience of it. Thus, to understand a theory of vegetation, one must recognize the archetypal plant revealed behind all particular instances. There is only one “plant” discovered in each and every case. Consequently, any theory of plants will be identical to *the* plant itself since the universal must be seen in the particular in order to recognize it as a particular instantiation of that universal. By discovering this universal through its various particular expressions, the observer recognizes the inner necessity and unity of the phenomenon and thereby reveals it to be its own theory.

Through careful examination of the phenomenon, the researcher might reach this “pregnant point” (Goethe 1988h, p. 41) beyond which no further discovery can be made and from which every manifestation of the phenomenon—both actual and merely potential—can be derived. The encounter with this *Urphänomen* should not, however, be understood as an observation of an independent, objectively existing object; rather, it is the appearance of the principles that define, guide, and delimit the organism in the sensory imagination. It is, as Timothy Lenoir observes, the “appearing idea” (Lenoir 1987, p. 24)—a concept that both Weizsäcker and Hegge note falls within the wider Neoplatonic tradition (von Weizsäcker 1987, p. 129; Hegge 1987, p. 213).¹⁴ In other words, it is the idea that gives intelligibility to an object and allows for the recognition of a given phenomenon in other contexts and variations. Yet because the idea appears in every one of its various manifestations, any particular expression becomes a metaphor for all related instances of the same phenomenon.

As the preceding discussion may disclose, this *Urphänomen* can neither be an objective reality existing independently of observation nor a purely subjective event, since the underlying principle of the thing itself is what ultimately appears in the imagination. The *Urphänomen* therefore exists as the poetic, participatory encounter between the subject and object.¹⁵ The archetype never manifests in nature except through an encounter with the productive imagination in the human observer. This encounter is, therefore, a higher actualization of the phenomenon itself. It is, in the words of Zajonc, a “transcendancy of [nature’s] being” (Zajonc 1998, p. 312). Epistemology and ontology collide in this event, for the way a thing is known simply *is* the thing itself. Goethe’s participatory ontology concerning archetypal forms is therefore an ontology that overcomes the Cartesian split of subject and object and, simultaneously, the Lessingian ditch between the eternal and the ephemeral.

This ditch is bridged in more than one manner. Since the *Urphänomen* acts as a law and delimitation of creaturely motion, certain effects, such as the *Baupläne* (or organizational layout) of animals, can be regarded as the products of these necessary laws. In fact, for Goethe, the very task of science itself was to uncover these necessary connections between the various manifestations of a given creature and its archetype (Hegge 1987, p. 205). There are certain reasons why an organism manifests in the way it does, and it was the task of science to reveal these truths. For instance, the expansion of one part of an organism may force a balancing contraction of another part as compensation. In a very real sense, then, form plays a causal role in the development of organisms. Goethe labels this capacity for self-determination as the creature’s “entelechy,” a term he borrows from Aristotle (Bortoft 1996, p. 268). This capacity is, as Ronald Brady reminds us, the very condition of life itself—“a necessity to change in order to remain the same” (Brady 1987, p. 287). Each developmental stage is not simply a progression toward the archetype but also a novel expression of it. In other words, previous stages are not made irrelevant by later stages; the form manifests only when the full continuity of the motion is grasped. Hence, the

archetypal form of the creature will appear to the observer as a “time-form” which can unify the differences of time in the same manner spatial forms unify the distinctions of space (Brady 1987, p. 286). In this way, a flicker of the universal is present in every particular, gleaming through it as a meaning does through symbol.¹⁶

Thus, Goethe’s symbolical view of nature allowed the ideal to become real without fully extricating it from the world of matter. Each particular manifestation becomes greater than itself in its capacity to represent the various other stages of development within its own expression. The part, then, can symbolize the whole in that the whole is *in* the part. Each sensible appearance of a given thing is merely an infinitesimally partial sign of its complete underlying reality. In a word, the potentiality of life overflows its actuality (Brady 1998, p. 106). Yet, simultaneously, the meaning of the whole is present in every part. An analogy would be the power of symbols and gestures to convey meaning. Each expresses the attitude and thoughts of a person, yet the meaning itself is not given in the individual words, letters, and actions. Rather, meaning arises from the whole yet reveals itself through the use of symbolic figures and movements.

As such, the meaning of the individual letters and gestures cannot be understood outside of their given context. In the same way, no individual manifestation is wholly understood unless seen within the light of its meaningful context—namely, its place within the *Urphänomen*. Once grasped, the observer moves beyond the sensory and into the ideal, which is, for Goethe, the divine idea that structures reality, thought, and speech (Zajonc 1987, p. 235). Dividing between understanding, which is the cognitive faculty of rational and standard scientific thinking, and reason, which is the intuitive perception that arrives at the *Urphänomen*, Goethe writes, “The understanding will not reach her; man must be capable of elevating himself to the highest Reason, to come into contact with the Divinity, which manifests itself in the primitive phenomena, which dwells behind them, and from which they proceed. The Divinity works in the living, not in the dead; in the becoming and changing, not in the become and the fixed. Therefore reason, with its tendency toward the divine, has only to do with the becoming, the living; but understanding with the become, the already fixed, that it may make use of it” (Goethe 1850, pp. 137–38).

5. Spiritual and Ethical Implications of Goethean Science

Given the intimate connection between nature and the divine, it is little wonder that Goethe invites the scientist to consider her work as involving her own spiritual development. The discovery of the *Urphänomen* is not merely an epistemic event. If, as noted, Goethe’s proposal merges epistemology with ontology, this can only be achieved through the development of novel cognitive “organs” in our investigation and contemplation of the world. He states, “The human being knows himself only insofar as he knows the world; he perceives the world only in himself, and himself only in the world. Every new object, clearly seen, opens up a new organ of perception in us” (Goethe 1988h, p. 39). There is, therefore, reciprocity between the observer and the world; novel phenomena bring forth new cognitive organs in the contemplative observer, and these organs, in turn, create the world of experience and produce the higher actualization of the objects of experience.

As such, knowledge of the world is inseparable from self-development. The higher actualization of the object in the *Urphänomen* is simultaneously a higher actualization of the human person who discerns it. Moreover, since the *Urphänomen* represents the final stage of scientific knowledge, science only arrives at *true* science when scientists are trained to develop themselves through contemplative interaction with the phenomenon (Bortoft 1996, p. 210).

Goethe’s position here contains an implicit criticism of the Kantian epistemology taking root in Germany during his life. While Goethe readily absorbed the role Kant gave to the constitutive mind in allowing for the possibility of perception, he would radically break from this tradition by arguing that apodictic cognition was not limited to the realm of the *a priori*. Thus, while agreeing that organizing ideas craft our phenomenal experience, Goethe argued that novel cognitive “organs” might arise through careful attention to objects of

perception. By positing the existence of an “intellectual intuition,” Goethe could reconnect Kantian epistemology with the world. Thus, the mind’s active construction and creativity are a spiritual participation in what is fundamental to nature itself; the idea is not something distinct from the thing in itself but realized together in mind and in nature.¹⁷ In other words, for Goethe, divine communion and personal spiritual ascent meet hand-in-hand with a participation in the world of nature. Science and spirituality embrace.

And, through this union, one finds a solid ground for our ethical obligations toward one another. If the divine idea acts as the principle and end for all natural beings, humanity is no exception. It therefore represents the “divine powers . . . inherent in human nature” (Nisbet 2002, p. 221). Goethe’s ethics were, contra the rationalism of Spinoza and Kant, one of affective sensibility. As Nisbet notes, all of the morally exemplary characters within his major literary works possessed an “ethics of the heart rather than of the head” (Nisbet 2002, p. 229).

Nevertheless, Goethe still found affinity with Spinoza by placing love at the center of his ethical schema. For Goethe, love’s centrality was established by the divine principles present in all things. Here, again, one finds resonances with Plato’s discussions on love, especially as they are described in his *Symposium*. Goethe’s ethic is perhaps best demonstrated in his discussion of the virtue of reverence. Reverence [*Ehrfurcht*], Goethe claims, can be directed at those above, below, and at our level, and all three forms are found within existing religions. However, a fourth kind of reverence is needed—one for ourselves. Yet this reverence does not stem from an egoic sense of personal achievement or superiority. Rather, this veneration of the human person derives solely from the divine principle residing within us all (Nisbet 2002, p. 223).

Hence, a recognition of the *Urphänomen* that undergirds all natural beings demands an attitude of respect and love—not just for humanity but for all creatures (though, admittedly, in a lesser form for nonhuman beings).¹⁸ This stance of love toward the other is not just the *right* response for one’s own spiritual development; it is, by the very implications of his views, the only *natural* one. Love is, accordingly, the spiritual force behind nature’s ascent. In his *The Metamorphosis of Plants*, Goethe describes the growth of certain species as acting “with irresistible force and tremendous effort” toward “[equipping] them for works of love” (Goethe 2009b, p. 6).

Likewise, in a poem by the same name, he parallels the journey of two lovers to that of plant development, stating, “Love sanctified, / Strives for the highest fruit—to look at life/In the same light, that lovers may together/In harmony seek out the higher world!” (Goethe 2009a, p. 3). In these lines, the same process of diversification, unification, and spiritual intensification describe the lover’s journey, and the imagery of plant development provides the needed analogy for a further recognition of this truth. In other words, the same fundamental force that unites two lovers in union propels the world in its cosmic, spiritual ascent toward the divine. To love, then, is the most natural act of all and the end towards which we all must strive. As with Plato, it is the ladder of ecstatic ascent away from mere appearance toward the things as they truly are. This, for Plato, is the ultimate end of the human soul (see Schindler 2008, pp. 130–31). As Diotima in the *Symposium* guides readers along the path of love towards its *telos*, so Goethe leads his audience along the same divine journey.

6. Conclusions

Thus, I conclude that Goethe’s alternative scientific approach presents a vision of the world, knowledge, and ethics that offers fruitful resources for contemporary science and philosophy. But one might wonder if this suggestion is overly optimistic. Is a different form of science realistic? Has not the scientific community largely forgotten Goethe and his supposed achievements? Even in his day, Goethe’s peculiar form of scientific research was received with a general coldness by his academic contemporaries. Goethe himself regarded his endeavor as a doomed enterprise, at least in an immediate sense. Near the end of his life, he wrote a letter to the composer Carl Friedrich Zelter, proclaiming, “We, and perhaps

still a few others, shall be the last of an era that will not soon return” (as cited by [Altner 1987](#), p. 342). The tides of history swept against Goethe and his wholistic form of science. While during his life, Romantic systems of science—such as the analogous work being accomplished by the *Naturphilosophen*—were undeniably part of the empirical science of the day, later periods would increasingly distance themselves from what they regarded as speculative and pseudoscientific approaches. Attempts to purge scientific discourse of all scholastic vagaries and “occult qualities” continued apace after Goethe’s death. Disciples of the Newtonian tradition gazed with incredulous eyes upon any method that seemed stained with the remnants of the unenlightened past. Spying the phantom of the ancient physics lying behind Goethean science, later scientists would frequently banish his works for these imagined sins, ensuring the continued triumph of mechanistic thinking.¹⁹

Yet the reaction to Goethe’s unique form of science has not been entirely dismissive. For instance, his trailblazing works in morphology and the discovery of the intermaxillary bone are both generally acknowledged contributions to scientific history ([Bortoft 1996](#), p. 32). Moreover, a small but very present undercurrent of scientific work exists that continues to expand upon his effort. By one outdated count taken in 1998, over 10,000 studies have been directly inspired by Goethe ([Reigner 1998](#), p. 178). Both Walter Heitler, whose work helped to shape a quantum theory of radiation, and Herbert Hensel, a specialist in sensory physiology, worked within the tradition set out by Goethe. The famed physicist Mitchell Feigenbaum has also been thought to have drawn influence from the great Romantic ([McCarthy 2006](#), p. 176). In biology, Mae-Wan Ho, Herbert Hensel, and the controversial Rupert Sheldrake are among the three most famous Goethean representatives, and George McGhee has noted a resurgence of Goethean ideas through current work on theoretical morphospaces ([McGhee 2007](#), pp. 180–83).

In the philosophy of biology, Oxford’s Mary Midgley has defended Goethean science as a genuine strand of scientific inquiry ([Midgley 2010](#)). Within the general philosophy of science, Goethe’s attacks on the scientific enterprise of his day foresaw many of the greatest developments in the field over the past century. Paul Feyerabend, for instance, praised Goethe for his assaults on the dogmatic adherence to Newtonian theory of color and his unsurpassed skill as a historian of science ([Feyerabend 1970](#), p. 162). Feyerabend’s work, coupled with that of N. R. Hanson and Thomas Kuhn, has also brought to light the historical dimension of scientific paradigms and the impossibility of language freed from all theoretical baggage. In this respect, they merely expanded upon the ground that Goethe’s original critiques had already laid. Indeed, contemporary defenses and applications of Goethean science continue to appear in scientific literature (e.g., see [Landman-Reiner 2021](#)), and there is little reason to suppose this will cease anytime soon. Of course, none of this is to suggest an uncritical acceptance of all Goethean ideas and concepts; however, it does suggest that Goethe is an example of an alternative form of science and a valuable (and largely untapped) resource.

Yet Goethe is perhaps most relevant not simply for his novel scientific views but for how they may effect a union of spirituality, science, and philosophy. As this paper demonstrates, his Platonically inspired scientific enterprise achieves a marriage of opposites—eternal and temporal, sacred and mundane, mind and heart. However, the greatest wedding results between Goethe’s two great loves: poetry and the natural sciences. Nature becomes a symbol which conveys meaning beyond itself, and the world transforms into a magisterial work of art in which no part can be appreciated except through the revelatory illumination of the whole. The finite partakes of the infinite and, in this way, contains the seed and the symbol of the infinite divine within itself. Science is in want of a language to convey this reality—a reality that always speaks of more than itself. For Goethe, while literal language may often suffice, only poetry was truly adequate for the task. Poetry thus becomes not an escape from reality but the only suitable vehicle through which the world can be expressed in all its richness. As Goethe himself urged, “We get by in life with our everyday language, for we describe only superficial relationships. The instant we speak of deeper-relationships, another language springs up: poetic language”

(Goethe 1988i, p. 26). Over a century before C. P. Snow diagnosed the disease of the two cultures, Goethe may have already provided the antidote. In this way, as in many others, Goethe spoke ahead of his time. Perhaps, as Michael Martin so eloquently puts it, “Goethe’s science . . . was so revolutionary that we are only just now catching up with it” (Martin 2015, chp. 4).

Funding: This research received no external funding.

Data Availability Statement: No new data were created or analyzed in this study. Data sharing is not applicable to this article.

Conflicts of Interest: The author declares no conflicts of interest.

Notes

- ¹ I am thankful for the reviewers of this article who have provided helpful suggestions that have significantly improved the quality of the work.
- ² There has, of course, been some work in this direction (Amrine 2016). However, I have failed to discover a piece that examines this Platonic influence in detail and its impact on Goethe’s scientific work.
- ³ Translated from “Hinter jedem Wesen steckt eine höhere Idee. Das ist mein Gott, das ist der Gott, den wir alle ewig suchen und zu erschauen hoffen, aber wir können ihn nur ahnen, nicht schauen. Ich frage nicht, ob dieses höchste Wesen Verstand oder Vernunft habe, sondern ich fühle, es ist der Verstand, es ist die Vernunft selber. Alle Geschöpfe sind davon durchdrungen, und der Mensch hat davon so viel, daß er Teile des Höchsten erkennen mag”.
- ⁴ This “multiplicity within unity” is perhaps most clearly manifested in the scientific field Goethe himself pioneered: comparative morphology. As Carl Friedrich von Weizsäcker states, “The discrete, the enumerable exists only in thought; reality is characterized by continuity. Comparative morphology, therefore, exhibits the unity of reality in the continuity of the forms” (von Weizsäcker 1987, p. 123).
- ⁵ The privileged designation Goethe gives to the leaf has often left his commentators baffled. Why did Goethe opt for the term leaf for his Uroorgan? Goethe himself struggled to find some “general term” [ein allgemeines Wort] that would act as a lens through which to see all the various manifestations of the plant’s organs. While settling on the leaf, he nevertheless goes on to admit, “Thus we can say that a stamen is a contracted petal or, with equal justification, that a petal is a stamen in a state of expansion; that a sepal is a contracted stem leaf with a certain degree of refinement, or that a stem leaf is a sepal expanded by an influx of cruder juices” (Goethe 2009b, p. 102). This admission reveals that Goethe had to settle for the term leaf since no available word could adequately capture the movement of plant growth and reproduction. Yet given that any plant organ could serve the function, why did Goethe opt for the leaf? Richards has postulated that Goethe’s observation of fan palms likely inspired his choice since these leaves retain their leafy appearance even during their transformation into flowers. This, coupled with the leaf’s veiny structure (an aspect Goethe tied to the reproductive powers of the plant), encouraged Goethe to regard the term leaf as the most appropriate choice (Richards 2002, p. 418). While these observations likely confirmed Goethe’s decision, it seems more probable that, as Adolf Portmann notes, Goethe’s original choice stemmed from the fact that many botanists already believed the leaf to be the original plant organ. Even as early as the late 17th century, Nehemiah Grew and Marcello Malpighi had advanced a similar hypothesis. This idea was again picked up later by Goethe’s predecessor Caspar Wolff (Portmann 1987, pp. 134–35). As such, it seems more likely that Goethe’s choice derived from his decision to utilize an already existing tradition for the sake of his own didactic purposes.
- ⁶ I freely (and, perhaps, loosely) borrow this term from Radical Orthodoxy as it is used in John Milbank (1997) and Catherine Pickstock (2013).
- ⁷ This process of tension and resolution provide a foundation for most of Goethean science, such as the tension between light and dark and their resolution in color. As Seamon notes, this fundamental feature of the world points toward “an instantaneous, living dialectic that joins the parts in a dynamic, interpenetrating whole” (Seamon 1998, p. 6).
- ⁸ Thus, Goethe’s 1810 work *Zur Farbenlehre* was likely directed not only to undermine Newton’s theory of colors but his entire methodology of science, as well.
- ⁹ Goethe himself pairs truth with fruitfulness: “But there remains one trait by which we can most accurately distinguish the true from the illusory. The true always bears fruit” (Goethe 1988d, p. 47).
- ¹⁰ As Michael Martin notes, “Goethe’s delicate empiricism, then, proves to be a nascent form of what would become known in the twentieth century as phenomenology. Indeed, phenomenology is almost unthinkable without the contribution of Goethe” (Martin 2015, chp. 4).
- ¹¹ These stages may have been at least inspired by Plato’s analogy of the divided line. See Plato’s *Republic* 509d–511e.
- ¹² Cf. *Enneads* I.6.9, where Plotinus declares that eyes can only see the sun because they have first become “sunlike.”

- 13 As such, as Daniel Steuer notes, scientific language should concern itself primarily with Urphänomene since they “indicate the observable limits of human insight into nature” (Steuer 2002, p. 166).
- 14 The incorporation of knowledge into being is, as Hans-Georg Gadamer reveals, “the presupposition of all classical and medieval thought” (Gadamer 2004, pp. 454–45).
- 15 Contra Jocelyn Holland, the Urphänomen is not “more than illusory, if less than alive” (Holland 2009, p. 20) but manifested in the act of observation itself. It therefore does not represent a mediating position between life and illusion but, by being the principle of growth and motion, is the very life of the organism itself.
- 16 For a contemporary biological application of Goethe’s principles, see the work of Mark Reigner (Reigner 1998).
- 17 It should be noted that, like Kant, Goethe’s reception of Schellingian thought was not indiscriminate. As Dennis Sepper notes, Goethe was “rather cool” to the “speculative excesses and transcendentalizing” of Schelling and fellow idealists (Sepper 1988, p. 169). Hans Urs von Balthasar echoes a similar statement, remarking, “. . . the Idealists preferred to deduce nature to an a priori system, or, if they were Romantics, to feel a vague irrational feeling of the whole. Goethe was just as much a lone fighter in his age as Thomas Aquinas had been when he sought to combine exact research and intellectual work with a reverentially pious perception of the divine in the cosmos” (von Balthasar 1991, p. 363).
- 18 A general biological principle for Goethe was the progressive realization of environmental independence as one ascends the chain of life. Since spirit represents the telos of matter, it comes as no surprise that the more advanced (i.e., “spiritualized”) a form of animal life is, the more liberated it is from material environmental factors. For instance, the amphibian lung gives it an advantage over the fish. The reptilian internalized fluid system allows for even greater independence. Birds take this further with their adaptation of warm-bloodedness. Finally, only mammals have the capacity to develop embryos in utero. At the peak of Goethe’s chain of being stands humanity, whose very unspecialized nature enables them to inhabit an array of varying habitats.
- 19 Zajonc notes that by 1853, even Helmholtz, who was generally sympathetic toward Goethe, intentionally distanced himself from Goethe in order to place himself squarely within the reigning mechanistic paradigm (Zajonc 1987, p. 220).

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