THE SENSE OF THE BEAUTIFUL AND APOPHATIC THOUGHT: EMPIRICAL BEING AS IKON

by Michael Craig Rhodes

Abstract. This essay is an interdisciplinary study of beauty that attempts to bridge the gap between religion/theology and science in some measure by drawing from Dionysius the Areopagite (c. 500) a notion of being that I argue is consonant with the notion of the sense of the beautiful, which I develop using Steven Weinberg's and Werner Heisenberg's discussions of empirical beauty. I use the term *ikon* to refer concisely to Dionysius' theophanic notion of being, namely, that the beyond-being is nonsubstantially present in being.

Keywords: apophasis/apophatic thought/apophaticism; beauty; Dionysius the Areopagite (Denys); empirical being; ikon; science; theology; theophanic

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In this essay I intend to show that empirical beauty, crucial for the work of science, is no less crucial for the work of theology and that apophasis, crucial for (at least certain forms of Christian) theology, is no less crucial for the work of science. My case relies on the epistemological assumption of beauty in the work of modern science as expressed by Steven Weinberg and Werner Heisenberg, on the one hand, and on the metaphysical characterization of beauty in neo-Platonic thought, adopted in part by both Weinberg and Heisenberg and instrumental for Dionysius the Areopagite (henceforth Denys), on the other.

Structurally, the essay has three main foci. First, I focus on Weinberg's and Heisenberg's treatments of beauty to develop a notion of the sense of the beautiful. Second, I suggest that this notion seems to exhibit a sense of apophaticism. Third, I offer my interpretation and application of Denys's position, which, I argue, (1) provides a plausible interpretive framework

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for addressing the question of the origin of the sense of the beautiful through what I dub his notion of (beautiful-)empirical-being-as-ikon and therefore (2) establishes a relationship, through matter and apophasis, between science and theology.

Scientific Discovery: The Influence of Beauty

In the context of making his argument for the probability of the discovery of a "final theory" (*Dreams of a Final Theory*, [1992] 1994), Weinberg argues that beauty, or a sense of the beautiful, plays a significant role in the toil of scientific discovery. In a chapter titled "Tales of Theory and Experiment" he recounts a tale of Einstein's general theory of relativity (GTR) to this end.

Since the mid-1920s, just a few short years after Einstein introduced it to the world, his theory of gravitation had begun to affect physicists' understanding of gravity. It seemed that Newton's position was no longer viable; what had once seemed to be a fundamental assumption concerning gravity suddenly was relegated to the level of an apparent scientific error. This was not, however, a complete surprise; an ongoing difficulty with Newton's system had been recognized earlier, at least among specialists. The problem had to do with a difficulty in understanding the orbit of the planet Mercury. During this time, Weinberg tells us, it was determined "that the orbit of the planet Mercury changes its orientation about 575 seconds in a century" ([1992] 1994, 91)—or a little less than one-sixth of a degree. This was more precession than Newton's theory would allow. Astronomers were able to determine that within Newton's system Mercury would predictably precess at a rate of 43 seconds per century more slowly, that is, it "should precess by 532 seconds per century" (p. 91). It was well known that Newton's theory might well become untenable on the basis of the resolution of this 43-second discrepancy.[1] Einstein's theory, according to Weinberg, was taken by many at the time as having dealt the leveling blow, but the available evidence would not have supported such a conclusion.

Weinberg reminds us of the difference between a *prediction* and a *retrodiction*. The former, although important for scientific theories, provides a weaker degree of support than the latter does. The reason for this, Weinberg writes, is that retrodiction deals with an already known anomaly whereas a prediction suggests "a new effect" (p. 96). Einstein's GTR predicts that "the photons in a ray of light are deflected by gravitational fields" (p. 92). This was shown to be the case, but the experiments (such as Eddington's star measurements during the 1919 eclipse expedition) had to be conducted. In the case of Mercury's precession, the experiments had been done; the empirical data were available, and Einstein's theory seemed to explain the data. Therefore, the only evidence supporting the general theory was *a* retrodiction and *a* prediction (pp. 97–98).

We might think that it would have taken much more. Newton's theory had served well for so long. Why, Weinberg asks, would we want to abandon it so quickly?

Einstein himself, Weinberg writes in correspondence with Arnold Sommerfeld in 1916, "three years before the eclipse expedition," says this: "'Of the general theory of relativity you will be convinced, once you have studied it. Therefore I am not going to defend it with a single word'" ([1992] 1994, 102). Einstein refers Sommerfeld to no evidence whatsoever yet maintains that the theory is convincing.[2]

Why did Einstein feel such a high degree of confidence in his GTR? What was it about the theory that those studying it found convincing? In Weinberg's opinion, it was the theory's beauty alone. Einstein's theory was so compelling in terms of its aesthetic appeal that belief in it, Weinberg contends, was maintained until further proof became available. According to Weinberg's account, a certain scientific faith in theoretical and cosmic beauty allowed Einstein (and other physicists) to wager on its ultimately being justified by experimental data.

Of Einstein's own conviction regarding his theoretical labors, Weinberg says, "something must have given him enough confidence in the ideas that underlie general relativity to keep him working on it, and this could only have been the attractiveness of the ideas themselves" (p. 102). Even before Einstein came across a geometry that would accommodate his theory, when reason would justifiably have resisted further pursuit, working fundamentally on the basis of two guesses or assumptions—"that gravitational and inertial forces were at bottom the same thing . . . the principle of the equivalence of gravitation and inertia" and "that gravitation is nothing more or less than the effect of the curvature of space and time" (p. 101)—he persevered in his work, Weinberg contends, because the beauty of the theory was so awe-inspiring and captivating. On this interpretation, neither reason nor experimental data compelled Einstein to press on; only beauty and its pursuit sustained him.

Furthermore, the fact that from 1916 on Einstein was nominated for Nobel prizes reveals how broadly the GTR was professionally accepted. Before the 1919 expedition, and fresh on the heels of the theory's presentation (in 1915), the scientific community in an apparently irrational and nonempirically sound manner was ready to honor him for his achievement (Weinberg [1992] 1994, 102–3).

Max Planck has argued that neither reason alone nor empiricism alone accounts for scientific developments.

> The man who handles a bulk of results obtained from an experimental process must have an imaginative picture of the law that he is pursuing. He must embody this in an imaginary hypothesis. The reasoning faculties alone will not help him a step, for no order can emerge from that chaos of elements unless there is the constructive quality of mind which builds up the order by a process of elimination and choice. Again and again the imaginary plan on which one attempts to

build up that order breaks down and then we must try another. This imaginative vision and faith in the ultimate success are indispensable. The pure rationalist has no place here. (Planck [1984] 2001, 162)

This would seem to hold as well for the evaluation of a fresh new theory. Something like an "imaginative vision and faith," fueled by reason and experimental data, must have informed the community of physicists and their critical evaluation of the theory. "The reception of general relativity," Weinberg continues, "depended neither on experimental data alone nor on the intrinsic qualities of the theory alone but on a tangled web of theory and experiment" ([1992] 1994, 104). However, it behooves us to recognize that "the important thing for the progress of physics is not the decision that a theory is true, but the decision that it is worth taking seriously —worth teaching to graduate students, worth writing text books about, above all, worth incorporating into one's own research" (p. 103). To put it differently, Weinberg's contention, like Planck's, seems to be that the important thing is that the decision is made, regardless of rational or experimental support, that it is compelling enough for physicists to be personally affected by it.

Heisenberg uses an analogy that is helpful here and one to which I return later. "To be sure," he argues, "this rational thinking and careful measurement belong to the scientist's work, just as the hammer and the chisel belong to the work of the sculptor. But in both cases they are merely the tools and not the content of the work" (Heisenberg 1990, 182). Taken with Planck's notion of an "imaginative vision and faith," this analogy offers a description of Weinberg's position, because for him the physicist is committed in a kind of irrational and non-empirically sound manner to an aesthetic vision. Dirac was so influenced by the scientific search for beauty, Weinberg says, that he concluded a talk at Harvard on his work in the development of quantum electrodynamics with this advice to the graduate students: that they "be concerned only with the beauty of their equations, not with what the equations mean" (Weinberg [1992] 1994, 132).

But what is beauty?

Weinberg's Description of Beauty

Weinberg, after providing two more examples of the effect of beauty on the scientific endeavor, "quantum electrodynamics—the quantum-mechanical theory of electrons and light" ([1992] 1994, 107–16) and "the development and final acceptance of the modern theory of the weak nuclear force" (pp. 116–31), moves on in the next chapter, "Beautiful Theories," to a discussion of what is meant by *beauty* in terms of physical phenomena. Early in the chapter he makes a telling concession: "I will not try to define beauty, any more than I would try to define love or fear. You do not define these things; you know them when you *feel* them. Later, after the fact, you may sometimes be able to say a little to describe them, as I will try to do

here" (p. 134). This is such an unscientific way of characterizing the work of science that one could mistake these comments for those offered by an artist, a poet, or a person of faith. It seems, however, that Weinberg's comment characterizes science as something that it really is: a human endeavor. And this characterization seems to reveal an aspect of science on which Planck comments:

> Science cannot solve the ultimate mystery of nature. And that is because, in the last analysis, we ourselves are part of nature and, therefore, part of the mystery that we are trying to solve. Music and art are, to an extent, also attempts to solve or at least to express the mystery. But to my mind, the more we progress with either, the more we are brought into harmony with all nature itself. And this is one of the great services of science to the individual. (Planck [1984] 2001, 163)

This description seems, in my view, to be in accord with the type of description that Weinberg offers. For him there are three aspects of the discernment of a beautiful physical theory: ideational simplicity, epistemological inevitability, and logical rigidity. With these three notions he delineates a sense of the beautiful that is requisite for the work of scientific discovery.

Ideational Simplicity. Weinberg's notion of simplicity is reminiscent of a kind of Ockham's-razor approach to theoretical physics. He offers two examples of ideational simplicity from Einstein's development of the GTR: his "guess" (as Weinberg puts it) "that gravitational and inertial forces are at bottom the same thing" (p. 100; cf. pp. 134ff.) and "that gravitation is an effect of the curvature of space and time" (p. 101). Einstein simplified the problem by proceeding theoretically on assumed grounds.

It is worth noting that Heisenberg emphasizes a similar point, explicitly connecting the notion of simplicity with truth as well as beauty:

> The Latin motto *Simplex sigillum veri*—"The simple is the seal of the true"—is inscribed in large letters in the physics auditorium of the University of Göttingen as an admonition to those who would discover what is new; another Latin motto, *Pulchritudo splendor veritatis*—"Beauty is the splendor of truth"—can also be interpreted to mean that the researcher first recognizes truth by this splendor, by the way it shines forth. (Heisenberg 1990, 174)

Epistemological Inevitability. Epistemological inevitability plays a different role in describing what beauty of a physical theory is. Weinberg speaks of this aspect as having to do with the specialist's evaluation of a theory; there are theories that just seem right, that seem perfectly balanced just as they are. This aspect might be discernible in a beautiful work of art as well, but whether it is discerned in a physical theory or in a sculpture, a poem, or a play, according to Weinberg, does not alter the epistemological impact that it has on our minds.

It probably is fair to say that almost everyone has experienced some piece of music—a Ralph Stanley banjo solo, for example—or some other

piece of art that has impressed itself on the mind in such a way that there seems but one conclusion, which might well strike us as being almost irrational (or, one might argue, *trans*rational): that it could not be otherwise by one note, one brush stroke, one word, and still be the beautiful work that it is (see Weinberg [1992] 1994, 135). So it is, according to Weinberg, with the specialist and certain beautiful theories such as the GTR. Einstein's conviction concerning the accuracy of the GTR was great, but he was utterly aware of the delicacy of his theory, and it is just this delicacy that distinguishes it and makes it beautiful, at least partly. Weinberg quotes him as follows: "The chief attraction of the theory lies in its logical completeness. If a single one of the conclusions drawn from it proves wrong, it must be given up; to modify it without destroying the whole structure seems to be impossible" (p. 135).

The expression *logical completeness* is rarely if ever used in discussions about poems, plays, sculptures, or other arts. But the tenor of Weinberg's argument seems to imply that Einstein's use of this expression is not necessarily in agreement with the manner in which logicians, for example, construct proofs of soundness and completeness. In a looser sense of the term, we might say that William Carlos Williams's poem "The Red Wheelbarrow" (1985) is logically complete because of its simplicity and focus:

> so much depends upon
> a red wheelbarrow
> glazed with rain water
> beside the white chickens.

The GTR uses the creativity of mathematics as its language for describing gravitation whereas poetry uses the linguistic creativity of common language to describe life. Both, though in different manners, are types of mental play that can lead us to descriptions that seem inevitable. Weinberg puts it like this:

> The beauty that we find in physical theories like general relativity of the standard model is very like the beauty conferred on some works of art by the sense of inevitability that they give us—the sense that one would not want to change a note, or a brush stroke or a line. But just as in our appreciation of music or painting or poetry, this sense of inevitability is a matter of taste and experience *and cannot be reduced to formula.* ([1992] 1994, 148; emphasis added)

Logical Rigidity. The last element that Weinberg describes is logical rigidity. Of his own endeavor as a physicist, and of the endeavor of "this kind of fundamental physics," he says:

> We are on the track of something universal—something that governs physical phenomena throughout the universe—something that we call the laws of nature. We do not want to discover a theory that is capable of describing all imaginable kinds of force among the particles of nature. Rather, we hope for a theory that rigidly will allow us to describe only those forces—gravitational, electroweak and

strong—that actually as it happens do exist. This kind of rigidity in our physical theories is part of what we recognize as beauty. (p. 147)

A theory is beautiful in terms of logical rigidity, according to Weinberg, insofar as it describes an existing force or forces rather than as it attempts to describe all possible forces.

By way of counterexample, Weinberg describes his point this way:

Shakespeare's plays are not spare perfect structures like general relativity or *Oedipus Rex*; they are big messy compositions whose messiness mirrors the complexity of life. That is part of the beauty of his plays, a beauty that to my taste is of a higher order than the beauty of a play of Sophocles or the beauty of general relativity for that matter. (pp. 149–50)

This sense of the beautiful, according to Weinberg, plays a crucial role in discovery and evaluation of theory: "not only is our aesthetic judgment a means to the end of finding scientific explanations and judging their validity—*it is part of what we mean by explanation*" (p. 149; emphasis added).

But what is the origin of this sense of the beautiful?

The Origin of the Sense of the Beautiful

"Where then *does* a physicist get a sense of beauty," Weinberg asks, "that helps not only in discovering theories of the real world, but even in judging the validity of physical theories, sometimes in the teeth of contrary experimental evidence?" (p. 157)

Weinberg's Evolutionary Theory: Two Analogies. Weinberg suggests that it "has gradually evolved through a natural selection of ideas": "the universe itself acts on us as a random, inefficient, and yet in the long run effective, teaching machine" (p. 158). In this sense, the origin of the scientist's sense of the beautiful, for Weinberg, is not unlike the experience that a racehorse trainer acquires from many years of witnessing the wins and losses of many horses; "he has come to associate, without being able to express it explicitly, certain visual cues with the expectation of a winning horse" (p. 158). The story of the development of the sense of the beautiful, Weinberg maintains, is similar to this. It has been learned through blood, sweat, and tears, as it were, inculcated through the intersection of curiosity and natural phenomena.

This explanation, for Weinberg, provides a helpful step toward inductively affirming the probability of discovering a beautiful final theory, which is Weinberg's primary concern. He makes this point, interestingly, by means of another analogy—an analogy with Platonic and neo-Platonic thought: "Plato and the neo-Platonists taught that the beauty we see in nature is a reflection of the beauty of the ultimate, the *nous*. For us, too, the beauty of present theories is an anticipation, a premonition, of the beauty of the final theory" (p. 165). More important for our discussion, both of these

analogies present the origin of the sense of the beautiful in a manner that seems to be tacitly apophatic. Before turning to the notion of apophasis, however, I want to look at Heisenberg's comments on the sense of the beautiful and his view of its growth historically.

Heisenberg and the Genealogy of Beauty. Heisenberg recounts a personal story about his interest in mathematics as a child. His father was wanting to encourage his Latin studies, so "he brought home to me one day from the National Library a treatise written in Latin by the mathematician Leopold Kronecker." He studied the treatise and was much impressed by it. In it, Heisenberg tells us, Kronecker deals with

> the properties of whole numbers . . . in relation to the geometrical problem of dividing a circle into a number of equal parts. . . . I sensed a quite immediate beauty in the fact that, from the problem of partitioning a circle, whose simplest cases were, of course, familiar to us in school, it was possible to learn something about the totally different sort of questions involved in elementary number theory. . . . The impression of something beautiful was, however, perfectly direct; it required no justification or explanation. (Heisenberg 1990, 167)

The beauty that he felt or experienced was apparently neither rational nor empirical. It was an experience, Heisenberg affirms, that was beyond the need for proof. His reflection on the experience led him to consider two ancient notions concerning the question of the One and the many:

> But what was beautiful here? Even in antiquity there were two definitions of beauty which stood in certain opposition to one another. . . . The one describes beauty as the proper conformity of parts to one another, and to the whole. The other, stemming from the Neo-Platonic thought of Plotinus, describes it, without any reference to parts, as the translucence of the eternal splendor of the "one" through the material phenomenon. (p. 167)

Heisenberg classifies his experience as being described by the first definition. "The parts here are the properties of whole numbers and laws of geometric constructions, while the whole is obviously the underlying system of mathematical axioms to which arithmetic and Euclidean geometry belong—the great structure of interconnection guaranteed by the consistency of the axiom system" (p. 167). The "interconnectedness" of the parts presents itself as though the individual parts do indeed belong together, "to this whole." But this experience is unique because, as Heisenberg says, *"without any reflection*, we *feel* the completeness and simplicity of this axiom system to be beautiful" (p. 168; emphasis added).

This same element of the sense of the beautiful was evident in Weinberg's description. He likened physical beauty, and the experience of it, to the experience of love or fear: "You do not define these things. You know them when you feel them" ([1992] 1994, 134). The interesting epistemological enigma is that these knowledge claims seem to arise from sensation and feeling—that is, they seem to be claims based on emotive experiences.

Heisenberg's notion of beauty leads him to the conclusion that "beauty is therefore involved with the age-old problem of the 'one' and the 'many' which occupied—in close connection to the problem of 'being' and 'becoming'—a central position in early Greek philosophy" (1990, 168).[3] For him, this describes the fundamental nature of the scientific endeavor.

Heisenberg contends that the role that beauty plays in the scientific endeavor was misconstrued from late antiquity to the early modern era. With the influence of Aristotle, the significance it had enjoyed since the time of the Pythagoreans and Plato slowly faded into insignificance until ultimately thought about nature became increasingly purely empirical while mathematics became increasingly more rational.

The problem of the origin of the sense of the beautiful, according to Heisenberg, has its roots in the "basic first principle" thought of the pre-Socratics and the problem of change. It was initially contemplated that a basic first principle would be a physical element—earth (Xenophenes[4]), air (Anaximenes[5]), water (Thales[6]), fire (Heraclitus[7]). But the notion of process, change, alteration, and becoming seemed perennially to disallow this prospect—a difficulty, as Heisenberg notes, "particularly apparent in the celebrated paradox of Parmenides"[8] and the other Eleatics (Melissus and Zeno). In the thick of antique thought, according to Heisenberg, even "at the starting point of Greek philosophy of nature," therefore, we find not surprisingly "the roots of exact science"—the problem of the basic first principle "from which the colorful variety of phenomena can be explained" (1990, 168).

Underlying the quest for a physical first principle lies the assumption, Heisenberg points out, "that understanding can never mean anything more than the perception of connections, i.e., unitary features or marks of affinity in the manifold" (1990, 168). That is, according to him, the scientific endeavor assumes the kind of experience he himself had with the Kronecker text, namely, an unjustified and unexplained recognition of beauty.

The Parmenidian Problem: The Unified and the Manifold. If there is a physical unitary principle of all, how is change to be dealt with? A physical unitary principle would require a static uniformity of nature, but the dynamic manifold of physical reality requires something quite different. Parmenides, as Heisenberg argues, shifted the discussion into a black-and-white, thesis-antithesis dialogue about being and nonbeing that disallows a synthesis and thus requires that change be viewed as an illusion, the latter point being most emphasized by his disciple Zeno. For Parmenides, the dissimilars being and nonbeing do not both exist. Only being exists, and those qualities that appear to be dissimilar aspects of being—coming to be and perishing, movement and cessation—express incompleteness. Being is utterly complete. Qualities expressing incompleteness cannot be aspects of being. They are merely "names which mortals lay down and trust to be

true."[9] Not only is this an unbearable paradox for most on purely common-sense grounds, it also decimates the possibility of empiricism, making science impossible.

The Pythagorean Solution. The Pythagoreans[10] offered mathematics (or number theory) as a basic first principle from which a complex numerology was developed, the center of which was the "tetractys": "At the centre of the numerology," says Jonathan Barnes, "was the tetractys or 'group of four', consisting of the first four numbers, which together add up to ten. Ten is the perfect number: it contains the important musical ratios, and it can be arranged to form a perfect triangle."[11] This is a crucial aspect of Pythagoreanism—apparently for both Pythagorean sects, the *mathematici*, or scientists, and the less philosophical *acusmatici*, or aphorists—because from the Pythagorean perspective the tetractys is both the source and the end of philosophical reckoning. Pythagorean numerology occasions an important shift away from physical elements and physical illusions of pre-Socratic thought toward "an ideal principle of form" (Heisenberg 1990, 170).

The Pythagoreans (and later Plato) offer primarily a theoretical or rational approach to understanding nature, however, so they do little for the advancement of science. Aristotle emphasizes the empirical to the detriment of the theoretical, which also does little for the advancement of science. The problem that arose, according to Heisenberg, was that theory and practice—the parts—needed to be united into a whole. "Only from the tension," Heisenberg argues, "the interplay between the wealth of facts and the mathematical forms that may possibly be appropriate to them, can decisive advances spring" (1990, 172).

This tension, however, was not capitalized upon subsequent to Aristotle's influence until the modern era.

> But in antiquity this tension was no longer acceptable and thus, the road to knowledge diverged for a long time from the road to the beautiful. The significance of the beautiful for the understanding of nature became clearly visible again only at the beginning of the modern period, once the way back had been found from Aristotle to Plato. And only through this change of course did the full fruitfulness become apparent of the mode of thought inaugurated by Pythagoras and Plato. (Heisenberg 1990, 172)

According to Heisenberg's reasoning, there was an epistemological dissonance that lasted from antiquity to the early modern era and the work of scientists such as Copernicus (1473–1543), heliocentricity contra Aristotle's geocentricity (Barnes 1987, 212; Dantzig 1954); Galileo Galilei (1564–1642), "laws of falling bodies" contra Aristotle's different rates for different weights; Tyco Brahe (1546–1601),[12] whose pretelescope observations showed Aristotle's view of the permanency of the celestial bodies to be erroneous and were instrumental in Johannes Kepler's (1573–1630) laws

of planetary motion;[13] and Isaac Newton (1642–1727), Newtonian mechanics and theory of gravitation. Even later, in the contemporary era, the revival of the Pythagorean-Platonic emphasis on number and harmony together with the sense of the beautiful has resulted, Heisenberg argues, in "the emergence of relativity theory and the quantum theory" (pp. 174–75).

> In both cases, after years of vain effort at understanding, a bewildering plethora of details has been almost suddenly reduced to order by the appearance of a connection, largely unintuitable but still ultimately simple in its substance, that was immediately found convincing by virtue of its completeness and abstract beauty—convincing, that is, to all who could understand and speak such an abstract language. . . . *"Pulchritudo splendor veritatis"*—"Beauty is the splendor of truth"—can also be interpreted to mean that the researcher first recognizes truth by this splendor, by the way it shines forth. (Heisenberg 1990, 174–75)

The sense of immediacy, of nondiscursive, nonrational direct apprehension of beauty, to which Heisenberg refers is crucial, he reasons, to the scientific developments we have witnessed over the past five centuries or so. Beauty, for Heisenberg, or at least beauty that describes his early experience with Kronecker's treatise, "is the proper conformity of the parts to one another, and to the whole" (p. 167). The Greek *harmonia* can be rendered as consonance (the conformity of the numerical ratios) as opposed to dissonance (the disconformity of the numerical ratios),[14] which according to Heisenberg is the seminal element of modern and contemporary science and the origin of the sense of the beautiful: namely, that physical phenomena can be understood by means of numbers.

Heisenberg speaks of two definitions of beauty (p. 167), but he is reticent to say anything about the other, more neo-Platonic, definition ("the translucence, through the material phenomenon, of the eternal splendor of the 'one'"). For him, the part-whole definition is the "more sober" one and is "realized in natural science, and . . . in exact science, no less than in the arts, *it is the most important source of illumination and clarity*" (p. 183; emphasis added). But, he maintains, "in actual fact, the two definitions are not so very widely removed from one another."

How closely related are they?

An Apophatic Account of the Origin of the Sense of the Beautiful

Apophatic thought can be traced back to the neo-Platonists (Plotinus and Proklos, for example), who strongly influenced Denys's thinking. But, although our primary interest is in Denys's use of apophasis, I want to discuss the nature of apophasis first from a pre-Socratic perspective.

Semantics of "Beauty": the Sense of the Beautiful and Apophasis. Richard Geldard begins his treatise on Heraclitus with a discussion of *apophasis*,

reminding us of the semantic roots of the term: "In the Greek, *apophasis* means denial or negation and is, therefore, a fitting place to examine the aversive thought of Heraclitus" (Geldard 2000, 23). *Apophasis* is the antithesis of *kataphasis* (affirmation); and, Geldard argues, the fundamental nature of truth, according to Heraclitean thought, is properly understood as being apophatic.

Geldard reminds us that the Greek *aletheia* "consists of a prefix *a*, and *lethe*, forgetfulness or forgetting." He continues: "Thus even truth-telling has an aversive cast, being a process of not-forgetting, as opposed to the more affirmative sense in the word knowing" (2000, 24) because the term translates literally as "not-forgetting."[15]

To know is a verb that is used by a speaker to convey an affirmation of knowledge, understanding, or truth to the hearer. In terms of contemporary epistemological theory, it often is very difficult to use this verb with any degree of persuasive power, or even with any degree of informational power, if it is used without proper argumentative support. Thus, for many, the term is used in opposition to the verb *to believe*. One may *believe* anything one wishes or fancies, but one may *know* only what is provable. Knowledge, in other words, is understood primarily, as Geldard argues, in an affirmative sense: I know *x* because I can support, or prove, it by *y* and *z*. But if truth telling, or making knowledge claims, is "a process of not-forgetting," it takes on an apophatic element. The act of truth telling, or knowledge saying, becomes one "of uncovering or un-forgetting" (2000, 24) rather than of providing affirmative proof. Hence, we might say that scientist so-and-so has *dis*covered—that is, *un*covered—such-and-such a truth.

Furthermore, given this notion of truth, when Heraclitus says "Nature prefers to hide" (Geldard 2000, 157),[16] he "uncovers," or "un-forgets" for us, according to Geldard, the nature of physical truth. For him, this concept implies that nature must be sought apophatically. It could be maintained, according to Geldard's reading of Heraclitus, that Einstein uncovered the general theory of relativity—that is, he ultimately was able to say what general relativity is by means of not-forgetting or uncovering the hiddenness of nature.

How does this theory of truth square with the analogies that Heisenberg and Weinberg have offered?

Heisenberg, as we saw, makes a distinction between the tools and the content of the work of the scientist and that of the sculptor, suggesting that science conceived of in this manner can be viewed as analogous to the work of a sculptor.[17] Furthermore, in treating the origin of the sense of the beautiful, Weinberg also makes use of analogies, as already noted. First, he argues that the sense of the beautiful is like the expertise of a horse trainer. Second, he contends that the sense of the beautiful for the scientist is like the Platonic and neo-Platonic sense of beauty.

All three of these analogies emphasize a nonrational, nonempirical perspective on the origin of the sense of the beautiful that seems tacitly to suggest an apophatic notion of truth in the sense of "sculpting" physical theory or "uncovering" certain visual cues and the beauty of the ultimate (which for Weinberg is simply the anticipation of a "final theory," not *nous* or beyond-being).

Geldard's reading of Heraclitus establishes a connection between the sense of the beautiful and apophatic thought. But the notion of apophatic thought, though helpful, remains somewhat undefined. Why, for example, does the sense of the beautiful lead the scientist to "uncover" empirical beauty? Heraclitean thought seems to leave such a question unanswered. To address it we turn to Denys's "sculptor analogy."

Denys's Sculptor Analogy: Empirical-Being-as-Ikon. With an analogy similar to that of Heisenberg's, Denys maintains that the theologian would be "just as the ones creating (*poiountes,* ποιοῦντες) a statue of natural things, removing everything that is an obstruction to the true sight of that which is hidden, and revealing this hidden beauty by means of negation (*apophasis*) alone" (Heil and Ritter 1991, *Mys. Theol.* II, 1025b). The central elements of this analogy are the notion of apophasis and the theophanic notion of the beauty of empirical being, or what I call the notion of empirical-being-as-ikon or beautiful-empirical-being-as-ikon.[18]

Denys never defines *ikon* (εἰκών) explicitly and, indeed, does not use it in the manner that I just have, but in accordance with his usage I should like to define *ikon* as *a (beautiful) created image that itself represents or manifests as a unity-in-distinction the uncreated (Beauty) of which it is an image.* Denys's theophanic notion of being, what I am speaking of as the notion of empirical-being-as-ikon, implies that as a created entity empirical being is separate and distinct from its archetype, the *un*created beyond-being, yet nevertheless contains in itself the unity of its archetype. Put differently, empirical-being-as-ikon affirms that the beyond-being is fully present in empirical-being but that the beyond-being is not being and that being is not the beyond-being. Thus, according to my interpretation, Denys's notion of ikon implies a double mystery: the mystery of empirical being and the mystery of the beyond-being. And this double mystery is played out in a relationship of beauty (cf. Suchla 1990, *De Div. Nom.* IV, 701c–704c).

But what is this beauty? It too must be understood, I believe, in two ways. First, this beauty is empirical. Some aspect of the material world—gravity, for example—is beautiful because of its interrelatedness with the rest of the world (Heisenberg's part-whole theory) and because this interrelatedness, if understood properly, is simple, inevitable, and rigid (as Weinberg would have it). Second, beauty is transempirical. A certain aspect of the material world is beautiful because it manifests and makes present in the empirical world a "world" and a "beauty" that are beyond the empirical. The double mystery of the ikon is therefore *aesthetic:* the mystery of

the *beauty* of empirical being and the mystery of the *Beauty* of the beyond-being (cf. Suchla 1990, *De Div. Nom.* IV, 701c–704c). My contention is that Denys's theophanic notion of being and his closely related conception of beauty supply a fuller philosophical (and theological) context within which to discover more completely the conceptual (and ontological) value of Weinberg's and Heisenberg's conceptions of beauty.

Ikonic manifestation or representation, according to Denys's thought, is ontological[19] imagery. The Beauty of the uncreated "ontology" of the One beyond-being is imaged through the beauty of the created ontology of manifold being and, for our purpose here, through the manifold of beautiful *empirical* being specifically.[20] Empirical-being-as-ikon, therefore, is not merely an image as a reflection but a created ontological existent that, ipso facto, images the uncreated beyond-being. This conception of ikon and ikonic manifestation or representation, as I understand Denys's thought, implies a panentheistic conception of the Divine that seems to support the Pauline endorsed conception "in him we live and move and have our being" (Acts 17:28 NRSV).

I suggested earlier that if Einstein's discovery of the GTR is taken in Geldard's sense, it could be affirmed that he "uncovered" the GTR by means of having "not-forgotten" the hiddenness of nature, that is, by means of having "not-forgotten" the beauty of empirical being. I suggested the same with regard to Heisenberg's and Weinberg's analogies. But I suggested that Geldard's position is not able to address why the sense of the beautiful might lead a scientist to uncover empirical beauty. Denys's notion of (beautiful-)empirical-being-as-ikon provides a metaphysical explanation to this query and, in so doing, supports Heisenberg's claim that the two ancient definitions of beauty are closely related and an origin of the sense of the beautiful.

What more precisely is the nature of this metaphysical explanation?

From a Dionysian perspective, a scientific discovery that reveals the beauty of empirical-being—Einstein's GTR, for example—"reveals" the mystery of the beauty of empirical being by means of apophatically "sculpting" or "uncovering," and because of the ikonic nature of being it also tacitly "reveals" the mystery of the beyond-being. Furthermore, the GTR as interpreted through Denys's notion of the double mystery of (beautiful-) empirical-being-as-ikon does not exhaustively "reveal" the empirical being of gravity, *because* it "reveals" the manifestation of the beyond-being in addition to "revealing" (in a very specific sense) the nature of empirical being. Thus, if beautiful empirical being is mysterious in its hiddenness (as Heraclitus maintains), it refers us, from a Dionysian perspective, to the notion of (beautiful-)empirical-being-*as-ikon*, which provides us with an explanation of what this hiddenness is and why empirical being manifests it through its beauty, and, therefore, with a reasonable suggestion for the origin of the sense of the beautiful.

The hiddenness of nature, interpreted from a Dionysian perspective, is both its integrated empirical beauty and the expression of the undifferentiated beauty of the beyond-being. Empirical being manifests this double sense of beauty because of the aesthetic relatedness between being and the beyond-being—that is, because of the ikonic nature of being.

The origin of the sense of the beautiful, then, ultimately is the beyond-being as Cause of created being, but proximately it is this aesthetic relational matrix (or the process of relational beauty,[21] as I refer to it below) between being and beyond-being that Denys envisions through his theophanic notion of being, namely, through what I have dubbed (beautiful-) empirical-being-as-ikon.

Science as a Kind of Theology. Interpreted in terms of Denys's notion of apophasis and (beautiful-)empirical-being-as-ikon, the notion of the sense of the beautiful would seem to imply ultimately that the work of science is a kind of theology. This follows because of the double mystery of empirical being (the mystery of the beauty of empirical-being-as-ikon implies the mystery of the Beauty of the beyond-being). This is precisely where Denys seems to me to be quite helpful.

Denys's position suggests a process of relational beauty through his notion of ikon. As I am characterizing it, this is the view that beautiful-being-as-ikon-of-the-beyond-being (that is, a human investigator) has the responsibility both of *kataphatically* receiving the cosmos and its constituent parts (gravity, for example) as (beautiful-)empirical-being-as-ikon-of-the-(Beauty-of-the-)beyond-being and of *apophatically* "aiming for, loving, and desiring" by means of the creative work of "sculpting"—that is, theorizing and experimenting—the beyond-being as the Source and End of what it is to be and to know (cf. Suchla 1990, *De Div. Nom.* IV 701c–704c; 708a–709d; II 645c–d; 649a–b; 817c–825c; VII 892b–893a). According to Denys, then, the sense of the beautiful is learned ("sculpted") through the process of kataphatic-apophatic response of beautiful-being-as-ikon-of-the-beyond-being (that is, of a human being) to the "call" (the "beauty," from *kalos*) of the Beauty-of-the-beyond-being through the medium of beautiful-empirical-being-as-ikon-of-Beauty-of-the-beyond-being (for example, through gravity), according to its hierarchical capacity (cf. Heil and Ritter 1991, *Cel. Hier.* III, 164d). This means that beautiful-being-as-ikon participates with the beyond-being by means of apophatically "calling back" to the "calling" of the Beauty-of-the-beyond-being through the "call" (the beauty) of beautiful-empirical-being-as-ikon. For Denys, this calling on the part of being is the process of theosis (cf. Heil and Ritter 1991, *Cel. Hier.* VII, 208d[22]), so in the final analysis being itself, qua beautiful-being-as-ikon, becomes the responsive "call" (that is, becomes a "beautiful" human person through the process of "sculpting") by "calling back" to the Beauty-of-the-beyond-being through beautiful-empirical-being-as-ikon. The work of science can then be interpreted more precisely as an

ascetic theological endeavor from Denys's perspective, one that could be used to illustrate a certain interpretation of Paul's "work out your own salvation with fear and trembling" (Philippians 2:12 NRSV).

The important implication of my analysis is that, while my interpretation and application of Denys to the question of the sense of the beautiful relocate the question in a broader philosophical (and theological) context, what I have described as Denys's notion of (beautiful-)empirical-being-as-ikon and his understanding of the apophatic work of theology are nevertheless fully amenable to the descriptions of the sense of the beautiful that we have derived from Weinberg and Heisenberg. My analysis contradicts neither Weinberg's "evolution of the sense of the beautiful" (though it does imply that the universe would not be a "random and inefficient teaching machine"—but this is an issue that I do not address here)[23] nor his concern for a final theory. It also does not contradict Heisenberg's notion of beauty as a part-whole relation but indeed seems to support his claim that the two definitions of beauty are closely related.

I have used Denys's position to suggest the notion of (the aesthetic double-mystery of) ikon as a response to the problem that I noted with a Heraclitean notion of apophasis: that the double mystery of (beautiful-)empirical-being-as-ikon explains why a scientist might be led by the sense of the beautiful to uncover empirical beauty. Thus, a Dionysian perspective on the origin of the sense of the beautiful has an explanatory capacity that appears able to maintain the integrity of the work of both science and theology and therefore seems to provide a plausible explanation of the origin of the sense of the beautiful.

It is important that the integrity of the work of both science and theology be maintained, because this increases the plausibility of the case. More important, however, if I am correct in my assessment, Denys's understanding of empirical being as ikon of the beyond-being argues from the nature of empirical being for the existence of both a natural and a methodological relation between science and theology that emphasizes the importance of both matter and apophasis for both science and theology.

Now, to address briefly an issue that (perhaps) has been tacitly lingering in the background: It is uncertain whether Einstein himself would agree with Heisenberg's and Weinberg's analogies, understood apophatically, as reflecting his own methodology. It is probable that he viewed his own work of discovery in a manner that could be interpreted apophatically, which would suggest that fertile terrain exists for arguing that his methodology is discernibly apophatic. I do not attempt here a full treatment of this suggestion to show that Einstein's discovery of the GTR did proceed in this manner. However, in my opinion the following passage captures the spirit of Einstein's perspective: "My religion consists of a humble admiration of the illimitable superior spirit who reveals himself in the slight details we are able to perceive with our frail and feeble minds" (Einstein

Archives, 48–380). This suggests to me an approach to the work of science that would be consonant with the Dionysian interpretation that I have offered. The value of this comment is that it expresses Einstein's belief that something beyond empirical being is revealed through the "slight details" of empirical being. Indeed, one such detail that Einstein felt privileged to perceive was his discovery of the GTR. But, judging from the tenor of this comment, the real value for him was in his having dis-covered something of the beauty of the "illimitable superior spirit" that was not already manifest. This suggests that Einstein's conception of the origin of the sense of the beautiful is at least akin to what I have suggested through my interpretation of Denys's conception of (beautiful-)empirical-being-as-ikon-of-the-beyond-being, and it implies that Einstein's discovery of the GTR could indeed be cast as having proceeded in a methodologically similar manner to my interpretation of Denys' conception of empirical being and the apophatic work of theology.

NOTES

1. Weinberg points out that "a theory like Newton's theory of gravitation that has an enormous scope of application is always plagued by experimental anomalies." So, even though this problem existed and was well known, it was not until Einstein's theory solved it that the importance of the anomaly was accurately evaluated ([1992] 1994, 93–94).
2. Weinberg admits that Einstein himself may have been influenced by the measurements of Mercury's precession; importantly, however, he does not draw Sommerfeld's attention to this data ([1992] 1994, 101–2).
3. Cf. Plotinus, *Enneads* (I,6[1], 4–9).
4. Cf. Laertius [1925] 1995, LCL II, IX 18–20; Hippolytus, *Refutation of All Heresies* I xiv 2–6; Barnes 1987, 93–99.
5. Cf. Laertius [1925] 1995, LCL I, II 3–5; Hippolytus I vii 1–9; Aristotle, *On the Heavens* 294b 13–21; Barnes 1987, 77–80.
6. Cf. Laertius [1925] 1995, LCL I, I 22–44; Aristotle, *On the Heavens* 294a 28–34; *Metaphysics* 983b 6–27; Barnes 1987, 61–70.
7. Laertius [1925] 1995, LCL II, IX 1–17; Hippolytus, IX ix 1–10; Barnes 1987, 100–126.
8. Plato, *Sophist* 237a; Proklos, *Commentary on Parmenides* 708.7–22; Barnes 1987, 129–42.
9. Simplicius, *Commentary on Physics* 144.25–146.27. On Zeno see Plato, *Parmenides* 127a–128d; Aristotle, *Physics* 233a 21–31; 239b 5–240a 18; Simplicius, *Commentary on Physics* 138.3–6, 138.29–140.6, 140.18–141.11. See also Barnes 1987, 129–42 (Parmenides) and 150–58 (Zeno).
10. Aristotle, *Metaphysics* 985b 23–986a 26, 986b 4–8, 1092b 8–25; *On the Heavens* 290b 12–29; *Physics* 203a 1–8, 213b 22–27; Proklos, *Commentary on Euclid* 379.1–16, 426.1–9; Barnes 1987, 202–13.
11. Heisenberg begins with Galileo. I mention Copernicus because Galileo was so influenced by him. In his essay "Scientific and Religious Truth" (1990, 213–29) Heisenberg does begin with Copernicus. Hans Reichenbach says this: "The significance of Copernicus lies precisely in the fact that he broke with an old belief apparently supported by all immediate sensory experience. He could do it only because he had at his disposal a considerable amount of accumulated scientific thought and scientific data, only because he himself had followed the road of disillusionment in knowledge before he glimpsed new and broader perspectives" (Reichenbach 1980, 14–15).
12. I am not aware of Heisenberg referring to Tycho Brahe. My reason for doing so I hope is obvious: because Kepler rides his experimental coattails.
13. Planck I think would disagree with listing Brahe, because he speaks of him as merely a "researcher," as opposed to Kepler, to whom he refers as "the creator of the new astronomy" (Planck [1984] 2000, 163).

14. String theory and M-theory may well play a part in the birthing of a beautiful "final theory," bringing into harmony antique convictions and contemporary data—such as ten as the perfect number and ten dimensions in string theory. Cf. Kaku 1995; Weinberg [1992] 1994, esp. chaps. 9, 10.

15. Geldard has been influenced (apparently) by Martin Heidegger on this issue. See Heidegger 1975; 1998; 2005.

16. φύσις κρύπτεσθαι φιλεῖ: "Nature/being loves to hide itself," or "Nature/being loves hiding itself." See also Heidegger 1991.

17. Cf. Plato, *Phaedrus* 252d 7; Plotinus, *Enneads* (I, 6 [1], 9); Denys, *Mys. Theol.* II 1025A–B.

18. For Denys, being (οὐσία) is rational and linguistic as well as empirical (Suchla 1990, *De Div. Nom.* IV 696D; Heil and Ritter 1991, *Ep*. IX.

19. I use the adjective *ontological* (and its noun form) well aware of its conceptual inadequacy. The phrase "the beauty of the uncreated ontology of the beyond-being" is meant to express the antinomic tension of Denys's conception of God. One could speak of the divine ontology, then, as a hyper- (or supra-) ontology: an ontology beyond ontology (*hyperousia* in Denys's terminology).

20. The notion of ikon as I have presented it here, together with the ensuing discussion, suggests the need for a discussion of the "beauty of holiness," a topic too involved for the present essay. I deal with this issue (in relation to the "process of relational beauty," which I mention below) in a forthcoming essay.

21. See note 20.

22. In this passage, Denys speaks of "theosis" as the "fully fulfilled science of the theurgies." Cf. *Ecc. Hier.* I 372b–373b; 376a–377b; II 393a; III 429c–432a; 433b–d; VI 536b–c.

23. From Denys's perspective, the universe could be conceived of as having a pedagogical function, but not one that is random and inefficient or one that is mechanistic. Beauty in Denys's thought is indeed instructive, so it could be maintained that one's sense of the beautiful evolves through such cosmic instruction. But, as I see it, both the instruction and the evolution would need to be conceptually and ontologically rooted in the aesthetic double mystery of ikon, implying that the instruction, as it were, would be purposeful, efficacious, and personal.

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