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# Beauty and Truth Again?

## Lessons from Physics, Art, and Theology

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There are distinct signs that the poet John Keats' Grecian Urn has found its voice again. This is a surprise. The final Delphic utterance of the decorated vessel in his poem *Ode to a Grecian Urn* runs: "Beauty is Truth, Truth Beauty, — that is all / Ye know on earth, and all ye need to know." Though well-known as verse, it has long been relegated to romantic wishful thinking.

The dominant, highly dualistic discussion of beauty and truth over the last century, and of aesthetics more generally, has long stifled the wistful notion that beautiful ideas are more likely to be true than ugly ones. Furthermore, multiple voices in late modern philosophy adopt the equally dualistic assurance that the objective (truth) and subjective (beauty) simply don't mix, that they support no connection, enjoy no conversation. Yet a recently-published and extensive survey of over 20,000 scientists in the US, India, Italy and the UK, *The Role of Aesthetics in Science*, by Brandon Vaidyanathan and Christopher Jacobi, found that only 34% of scientists disagreed with the statement declaring "mathematical beauty is a good indicator of scientific truth." A very large majority also found that the objects of their scientific investigations were aesthetically beautiful.

Here, I want to explore the reasons for the apparent failure to suffocate the Urn's continuing voice in our own time. Anticipating that this will require some philosophy as well as the testimony of science itself, the continually conflictual conversations between beauty and truth will

require listening to the arts, as well as the sciences. Surprisingly perhaps, the road to resolution leads through theology.

The erstwhile correlation of truth and beauty is beset with problems in both concepts—and these begin at the level of philosophical definition long before contesting any comparison. True objective reality is out of human reach (following Kant), without substance (following Berkeley), or subjectivity in disguise (following Hume). On the other hand, subjectivity is internal to any individual’s own response (after Schiller), so entirely relative, and resistant to external standards of merit, artistic or otherwise. If a Duchamp declares a urinal on its side to be art, then art it is. Attempts to de-relativize beauty seem always to slide towards a superficial utilitarianism (following Hegel).

Of course, a reader fatigued by fighting their way through this philosophical tangle can simply sweep aside its problematic history. They can simply assume the possibility of objective truth, most securely in the form of scientific knowledge. Similarly, a shared standard of beauty can be accepted as an axiom of faith—we all know beauty when we see it (if not all of us then at least qualified critics do, according to Hume). But even then, Keats’ *Urn* is found more frequently smashed into shards than admired—for science has repeatedly elicited not beauty or delight, but aesthetic revulsion. Only a decade after its poetic declaration of the unity of truth and beauty, Edgar Allan Poe penned his *Sonnet to Science* containing the lines:

*Science! true daughter of Old Time thou art!  
Who alterest all things with thy peering eyes.  
Why preyest thou thus upon the poet’s heart,  
Vulture, whose wings are dull realities? ...  
... Hast thou not dragged Diana from her car,  
And driven the Hamadryad from the wood  
To seek a shelter in some happier star?*

The same charge as Poe’s of disenchanting the world was laid at science’s feet by Keats himself, whose long poem *Lamia* complains that its “dull philosophy” has “clipped an angel’s wings” and that science

“unweaves the rainbow.” The rich aesthetic of wonder, awe and mystery that generates poetic beauty is not, at least for Poe and Keats, enriched by science, but rather sucked dry through acts of palpable violence.

The history of ideas begins to suggest a strangely inescapable consequence of bringing truth and beauty into conversation with each other—that of conflict at every turn. The act of relating objectivity and subjectivity seems to open a deep vein of non-reconciliation within the human experience irrespective of context, be that artistic or scientific. Examples abound, but one close to the conceptual heart of physics, on the one hand, and of the visual arts on the other, is the idea of *symmetry*.

Theoretical physicist and science-communicator Brian Greene is correct when he writes, “In physics, as in art, symmetry is a key part of aesthetics.” For my own part, one of the most beautiful results in all of theoretical physics is surely the theorem named after the brilliant German mathematician, Emmy Noether, who showed that for every symmetry in the laws of physics—in other words for every transformation that leaves them unchanged, such as observing the universe from a different direction or at different times—there must exist a conserved quantity. Such symmetry is spatially instantiated in the sparkling glory of crystals; it encompasses within its consequences the steady spinning of the Earth about the planet’s poles; it even generates the ordered families of ‘elementary’ particles of high-energy physics. Yet the aesthetics of even such powerful symmetry does not go uncontested. Francis Bacon, whose influence on the development of early modern science is hard to overestimate, confessed that “there is no excellent beauty that hath not some strangeness in the proportion.” For Bacon, pure symmetry seems to miss something essential to lasting beauty. Kant went further still: “All stiff regularity (such as approximates to mathematical regularity) has something in it repugnant to taste.”

In spite of the findings of Vaidyanathan and Jacobi, the more recent history of beauty and truth in science has also been much more usually characterized by conflict than consonance. Some fascinating signs that

all is not straightforward appear in their report. The example of symmetry exposes a current disagreement between different sciences—though esteemed within physics, is found much less attractive by life scientists. The physics-biology division reveals other divergences, the former finding simplicity more aesthetically pleasing, the latter complexity.

There have been, to be sure, high-profile proponents of beauty as a guide to scientific truth. Perhaps the high priest of these, within physics at least, is British theoretical physicist Paul Dirac, for whom, “it is more important to have beauty in one’s equations than to have them fit experiment.” Admittedly his relativistic version of the Schrödinger equation for the electron contains symmetries that are not only mathematically elegant but also lead inexorably to the unforced emergence of electron spin and of the existence of anti-particles. It is easy to understand how exposure to such siren examples as this have beguiled two generations of Dirac’s successors into searching for the path of physical truth behind the doorway of mathematical beauty.

The community of “string-theory,” for example, stands starkly in this tradition, now possessing a five-fold mathematical theory that contains an unimaginably vast number of possible universes, but no testable experimental predictions whatsoever. No wonder that its critics such as physicist and writer Sabine Hossenfelder, in her book *Lost in Math*, warn that, “Beauty is a treacherous guide, and it has led physicists astray many times before ... Physics isn’t math. It’s choosing the right math.” The implication is that “the right math” may not be the most aesthetically appealing, in spite of the opinions reflected in *The Role of Aesthetics in Science*. Hossenfelder is just one of a numerous and outspoken community of physicists who have, over several years, raised strong objections to the choice of the string-theorists to follow mathematical beauty rather than experimental evidence in guiding their program. The complaint is not purely methodological, but takes on moral aspects as well: surely science ought always to make contact with experiment? The duration, scope and wide discussion of these arguments is one reason to be surprised at the findings of *The Role of Aesthetics in Science*. The problematic example of string theory does

not seem to have deterred most of the field from allowing beauty a continuing place as a guide to truth.

Widening perspective beyond physics shows that any resolution of the tangled contest between knowledge and aesthetics will need to move beyond that particular science, even beyond the sciences as a whole, for a similar chorus of discordant voices seems to emerge in every disciplinary context. Turning the flow of the argument slightly, the visual arts have long furnished an arena for disagreement over whether claims for beauty are demonstrably true or not.

Japanese-American artist Makoto Fujimura writes, for example, of the modernist painter Mark Rothko's luminously colored canvasses, "Rothko's paintings are about standing in proximity to a kind of ominous, 'otherized' world. But I see hope in that unfamiliarity. And the reason is, it makes me want to go to my studio and paint again." Yet British art and literary critic Roger Scruton declares of Rothko's art, "the work consists of little more than a few rectangles of coordinated colors. Anyone who is not told the value of such art would find it difficult to identify it with beauty or beauty with any type of dollar value." Unpicking such stark divergence is challenging: the credentials underpinning both voices are as strong, their authors' engagement with ethical discussion as subtle and profound, though reaching completely different conclusions. If any generalization on their outlook holds, it might be that Scruton's mental gaze has turned more often to the past and to its traditions, Fujimura's to the future and its possibilities. Both critiques, positive and negative, therefore draw yet again on ethical dimensions to the question—it is impossible to resist questions such as which perspective, historical or future, ought one to prefer.

Although the "subjective/objective" dichotomy appears at first sight to have no moral, but only philosophical purchase, questions of ethics have therefore proved repeatedly inescapable whenever truth and beauty are put into conversation. Digging beneath the surface of the Scruton/Fujimura debate around Rothko's art, or that between Greene and Hossenfelder on string theory reveals ethical concerns, as we have seen, as well as suggesting the transcendent and rather profound nature

of the ethical issues at stake. In the light of them it becomes hard to resist asking, not only what aesthetic and moral philosophy have to say on questions of beauty, but to pose the same questions of theology too. This is not to urge assent to any form of religious belief (although such narratives do provide useful material in addressing morality), but simply to recognize that the academic discipline of theology, uniquely within the humanities, retains topics and critical tools central to the truth/beauty dichotomy. Among these lie critical histories of teleology (or “purpose”), the experience of truth itself, the possibility of the absolute, and a theology of aesthetics.

By this point, the reader will not be surprised to learn that the chorus of voices from theology is as discordant when it attempts to sing about beauty as that from any other discipline. The most systematic modern theologian of aesthetics, the Swiss Catholic Hans Urs von Balthasar, in his seven-volume work *The Glory of the Lord* (Herrlichkeit; *Eine theologische Ästhetik*) sets beauty at the heart of any illumination of human understanding of the transcendent:

*The beautiful is above all a form, and the light does not fall on this form from above and from outside, rather it breaks forth from the form's interior ... The content (Gehalt) does not lie behind the form (Gestalt), but within it ... Whoever is not capable of seeing and 'reading' the form will fail to perceive its content. Whoever is not illuminated by the form will see no light in the content either.*

Beauty “points to” otherwise hidden (theological) truth in the same way that light illuminates a dark place. In a, perhaps unexpected, connection, Makoto Fujimura agrees with von Balthasar. In his *Art and Faith*, a personal search for a Christian theology of an artistic vocation, he allocates to artistic creativity a sacred role that offers a pathway to restoring imagination in a world where it is in short supply. Yet not all agree – the German systematic theologian Rudolf Bultmann, in his *Belief and Understanding*, seems to take a diametrically opposing view:

*For Christian faith the idea of the beautiful has no formative significance for life; it sees in the beautiful the temptation of a false*

*glorification of the world, which withdraws the view from the “transcendent.”*

Beauty becomes a diversion from insights into transcendent truth, rather than Fujimura’s pathway into it, further heightening a dualism between the world and the eternal, the finite and the infinite.

Finding that beauty is contested within a current, at least Christian, theological context is perhaps not so surprising in the face of a very scarce attestation of cognate words in the Hebrew Bible or the Greek New Testament. Biblical authors don’t talk about beauty frequently, and when they do, the usage often gives rise to contest or affront. A collective connection between “beauty” with its Hebrew cognate (*yopi*) of the visual sense of “bright” or “glorious,” for example, is almost exclusive within the Old Testament to the Book of Ezekiel. Emerging from the continuous optical thread of image invoked by the prophet, his invocation of beauty is also part of a strategy to shock his hearers out of complacency. Elsewhere in the Hebrew Bible, beauty is more associated with action than with any static aesthetic. Isaiah’s messenger, to take another case, has beautiful feet because their owner brings good news of future vindication and peace to Israel following oppression and conflict, not because of any fastidious attention to pedicure.

The New Testament locus classicus of beauty (in the koine Greek of *kalos*) is also shot through with conflict. It is the episode in Mark’s gospel (chapter 14) where Jesus dines in Bethany with Simon, a diseased (and therefore outcast) man. This is the meal at which the first sign of future betrayal is attributed to Judas. Before that, an unnamed woman (who may be the same Mary of other episodes in the town) surprises the gathering by anointing Jesus from a fresh jar of expensive perfume. In the face of outrage from some of the guests, claiming that the cost would have been better dispensed to the poor, Jesus defends her action as “a beautiful thing. You will always have poor people with you. You can help them any time you want to. But you will not always have me.” In explanation he adds the doubly-remarkable saying, “What she has done will be told anywhere the good news is preached all over



the world. It will be told in memory of her.” First, this intimate, local action will become universally shared and global, and second, in a patriarchal culture the subject of its future cultural memory will not be the learned Jewish rabbi, but the woman whose creative imagination for symbol and sensitivity to historical moment saw the possibility for beauty. For Fujimura, the anointing of Mark 14 is central to a theological understanding of beauty in art:

*To me, all art resonates from the aroma of Christ as he hung on the cross. Art seeps out like Mary’s nard onto a floor that is supposed to be “clean”; such art reveals what is truly beautiful (Mary’s act) and what is truly injurious (Judas’ act) at the same time.*

Perhaps beauty is always contested, always the nexus of conflict, because it continuously challenges our out-of-joint temporal assumptions, our current misconstrued set of symbols, our manifestly incomplete set of representations of the world. An act that looked at first wasteful and messy, after a new work of beauty, points to the crucifixion—a larger act of apparently gruesome violence, but which constitutes the greatest expression of love in history. Beyond that new significance, both acts belong to a series that points forward to a future of unimagined healing and reconciliation. When that degree of radical creation is let loose within a confined cultural context that looks to the past, and which concentrates on the benefit of its established hierarchies, then such “beauty” is bound to be invisible at best, the provocation of violent resistance at worst.

Taking this idea—that the quality of beauty belongs more to action than to substance or form—and more to eternity than to the present moment, perhaps explains why theologian David Bentley Hart entitled his own study on the theology of aesthetics *The Beauty of the Infinite*. Hart notes that our experience of the “created other” (that is non-human material) is known through “the free and boundlessly beautiful rhetoric of a shared infinite.” Nothing finite or unfinished can ultimately be beautiful. He continues: “The rhetoric of the other evokes *my representations*” (my italics). This seems to capture my personal experience as a scientist attempting to represent the material world, in



words I could never have found for myself. Scientists who spend time thinking theoretically about the systems they seek to understand know the “in-betweenness” of a “representation of the other” evoked, for example, in the terms of theoretical physics, by nature’s “infinite and beautiful rhetoric.”

Fujimura’s and Hart’s theological explorations of beauty not only resonate with the experience of doing science, but go a long way towards disentangling, or at least explaining, the knots of conflict that have surrounded the celebration or rejection of beauty in science. They also underline the considerable theological consequences of the human vocation and ability to do science. For reappraising the entire scientific endeavor as a deep and long-term human project to become reconciled to nature, a “created other” that seems dark and threatening at first, opens science itself to the same theological narrative as that of beauty.

Beauty itself becomes eschatological—belonging not to objects in the present, but to the end of a story of actions, each pointing, just as anointing or resurrection do, to a future new order, reconciled to the human and understood. By so locating beauty at the end of the series of representations of the world that constitutes science’s own story, they show beauty as indicated and enacted, rather than instantiated within this or that theory or idea. In what is itself an example of such a “beautiful indication,” and also a step of reconciliation, this theology of scientific aesthetic also unearths some of the long-buried purposes and narratives of creativity that the sciences and arts share in common.

No wonder, therefore, that scientists disagree about beauty—some branches of science ascribing beauty to the simple, others to the complex, some to geometrical symmetry, others more to the presence and play of color (again these are all findings of the Vaidyanathan and Jacobi survey). A family of sciences as fragmented as is our own current patchwork of sub-disciplines can hardly be expected to agree on aesthetic criteria in our own age, any more than did schools of early-modern philosophy. But this is not to advocate abandoning beauty’s place within science. As pointers, as indications of the road forward rather than destinations achieved, beautiful experiments and theoretical

ideas can, and even must, be celebrated, their aesthetic appeal unashamedly enjoyed. For they point to the truly and eternally beautiful science that gazes on the natural world in as much completeness, comprehension and love as its creator who, in the final stanza of a great Hebrew poem:

*... looked to the ends of the earth, and beheld everything under the heavens,  
So as to assign a weight to the wind, and determine the waters by measure,  
When he made a decree for the rain and a path for the thunderbolt—  
Then he saw and appraised it, established it and fathomed it.*

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