

Title: The Sublime in Popular Science

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The sublime in popular science

By popular science I mean works of non-fiction aimed at communicating science to a general adult audience. It is a genre that is present in multiple media (TV and film documentaries for example) but I am focusing on the written texts only. Examples include books by Stephen Hawking, Brian Greene, Richard Dawkins, *etc.*

The sublime, however, is a much more protean concept, with a sinuous history. Longinus published a treatise, some time around 100 CE, called *Peri Hypsous* (*On the Sublime*) which defined a lofty, soaring style in oratory and poetry. Although Longinus used examples from nature when writing *his* loftiest passages, he considered the sublime a rhetorical effect solely evoked by great writers and speakers. This contains a kernel of resemblance to our modern usage, chiefly in the sense that Longinus felt the sublime could lead to *ekstasis*: a transporting of the audience out of themselves by astounding them.

Eighteenth century Britain saw an intellectual fashion for the sublime, following the first Latin and English translations of Longinus's work at the end of the previous century. English and Scottish writers generally considered the sublime to be a dual effect: delight mixed with terror. This trend culminated in the work of Edmund Burke, who contrasted the sublime with the beautiful, locating its source chiefly in nature, thereby repudiating most artistic attempts at the sublime and yet it was the Romantic movement in painting and poetry who seized on it as an aesthetic effect. One thinks of the paintings of Friedrich or the early poetry of Wordsworth, in which the human figure is overwhelmed, dwarfed by the immensity of nature that is at once alluring and forbidding.

Kant was following developments in Britain and, responding mainly to Burke, attempted the first systematic analysis of the sublime, which forms a large part of *The Critique of Judgement*. Kant establishes a movement of the sublime, whereby the subject is first struck by some large object in nature (the "dynamical sublime") or the contemplation of infinity (the mathematical sublime) and their imagination is overwhelmed. Then, one becomes aware of a "supersensible" faculty that allows us to think about the sublime object even as it exceeds our imaginative powers. This saving faculty is reason and in realising that it supersedes the imagination we are restored to a kind of equilibrium and feel no small delight in the process.

The sublime disappeared from philosophical discourse until its recrudescence in the 1980s¹ in continental philosophy and literary theory. I have detected three theories from this time —from Derrida, Lyotard and Lacan — that are especially germane to the sublime in popular science.

¹ Some exceptions include Barnett Newman's manifesto "The Sublime is Now" from 1948 and Thomas Weiskel's *The Romantic Sublime* from 1976.

Derrida posited the idea of the *parergon*, which means “outside the work”, distinguished from the work itself, the *ergon*. Derrida is interested in the paradoxical nature of a boundary or frame, which simultaneously is and is not of the work. He applies this to the columns that frame architectural works, the frames bordering paintings and also assumptions or central ideas that border or delimit written texts. Regarding the sublime:

art gives form by limiting, or even by framing, there can be a parergon of the beautiful, a parergon of the column or parergon as column. But there cannot, it seems, be a parergon for the sublime [...] because the infinite is presented in it and the infinite cannot be bordered. (Derrida 127)

We have another oxymoron, however, as the idea of something beyond the work or beyond the limit implies that there *is* a limit; and once a limit is established, it demarcates that which is inside as much as that which is outside. In works of cosmology, in Hawking’s *A Brief History of Time* for instance, we encounter many problems on the border of boundedness: the finite yet unbounded universe, imaginary time, whether or not infinite values make sense in physical equations, the singularity of a black hole, *etc.* Does quantifying something as “infinite” attempt a frame or form for what is necessarily frameless? I will discuss this updating of the Kantian mathematical sublime with reference to modern cosmological ideas, presented in popular science texts, wherein there is an unease with the problem of the limitless.

Presenting difficult content in an accessible manner is of course the *raison d’être* for popular science writers. For Lyotard, this is the source of the sublime in postmodern art, which is art that “presents the fact that the unrepresentable exists” (Lyotard 79). An example of this tension can be read in string theorist Brian Greene’s *Fabric of the Cosmos*, in which he spends hundreds of pages trying to help us visualise what cannot by definition be visualised: extra-dimensional space. Diagrams are no use as they exist, like his readers, in three spatial dimensions. He then spends almost one hundred pages explaining — admirably exoterically — the quantum measurement problem and what sub-atomic particles do: something that can never be presented because it is smaller than the wavelength of light, so we’ll never know what it looks like and also because it violates our basic, innate categories of causation and locality. Greene in the end cannot really do much to express this sublime except by repeatedly describing the results of quantum experiments as “stunning”, which is something of an anti-sublime, brought on by domesticating the content for his readers.

Most fundamentally, there is perhaps a paradox at the heart of all attempts at communication, what Lacan calls the Thing, which later writers have identified as the site of the sublime Lacan’s system. Shaw, for example, attempts to define the Thing as “a kind of non-thing; we become aware of it as a kind of void or absence residing at the heart of signification” (Shaw 134). In the context of contemporary physics, this calls to mind the ultimate gap in the heart of the system, namely Gödel’s incompleteness theorem, which proves that any formal system of sufficient complexity (arithmetic, predicate logic, *etc.*) can be either complete or consistent but not both². This problem is non-trivial when applied to the physical universe, where at the vanguard of theoretical physics, descriptions of nature at the most fundamental

² For a whimsical introduction to the theory, Douglas Hofstadter’s *Gödel, Escher, Bach* is still highly informative. For a text solely dedicated to the theorem, aimed at a non-specialist see Nagel and Newman’s *Gödel’s Proof*.

level are arguably purely mathematical. Max Tegmark's popular work *Our Mathematical Universe* is sublime in its continual attempts at overwhelming the reader with parallel universes, multiverses and infinities within infinities, but this is all in the service of his claim that all matter is actually an instantiation of mathematical structures. In tackling Gödel's problem, Tegmark encounters paradoxes even more basic than those discussed above.

Recognising that contemporary theorists have generally attached the sublime to the paradoxical, ineffable, unrepresentable — anything that confounds our imagination — then popular science seems a natural site for the sublime, specifically what I call the *modern scientific sublime*. It is surprising therefore that people interested in aesthetics and literary texts do not engage with this genre more often. But, if one assumes a more worldly, literary tone, one can say that the quality of writing in popular science certainly does vary widely and while some scientists and science communicators are extremely lucid writers, one wishes that the best writers from other genres were working in this field, because we might get subtler more variegated texts. What is interesting is that none of the texts I have examined really engage with the idea of why people enjoy having their minds stretched by unintuitive scientific ideas.

At this point we might ask what the sublime actually is. The traditional view was that it is a glimpse of the divine. When we run up against the limits of our comprehension nowadays, we can reach for an explanation less baroque than an encounter with the godhead or access to some transcendent, spiritual realm³. More materialist explanations present themselves, such as: is the sublime experience merely some kind of cognitive glitch? Our brains are neurologically bounded, we don't have unlimited capacities and so occasionally we encounter things that approach the limits of our cognitive powers⁴.

What is most interesting about the modern scientific sublime, I think, is that there is an isomorphism or homology — by which is meant a similarity or analogous set of features — between the way our cognitive apparatus struggles when presented with things at the limits of its capacities and the material found in popular science books which concern the limits of understanding, the limits of the universe, the vanguard of physical theories, the edges of what can be represented visually. In a sense, the content of popular science texts not only describe the real limits of the world and our understanding thereof, but induce within us an encounter with the limits of our thinking. Thus we have truly sublime content leading to sublime experience.

Finally, there is a latent or sometimes overt ecological message in many popular science texts. This makes them relevant to the current debates in ecocriticism, where the concept of nature being used is somewhat narrow⁵ and is in fact close to that used in the Romantic epoch: forests, birds, rivers, oceans, mountains. The modern scientific sublime offers an expanded view of nature to incorporate what we cannot see with the naked eye, all the way down to quarks and all the way out to the large-scale structure of the universe and including many strange phenomena in between

³ Although we could define a sub-genre of popular science texts that do attempt to use modern physics, especially quantum mechanics, to erect a mystical system or to argue a form of Platonism. Cf. the work of Roger Penrose.

⁴ Such an explanation is actually a not altogether satisfying endorsement of the Kantian formulation of the sublime in its basic structure.

⁵ Drawn, as it is, primarily from modern nature writing, another non-fiction genre that is currently undergoing a resurgence.

such as unfamiliar wavelengths of light, dark energy, black holes, the microscopic machinery of life, neurons, consciousness⁶ and perhaps even parallel universes. Although history says otherwise, I hope that a broader view of nature may lead to a richer conservationist message and that is the idea explored in the final chapter of my work, which will examine Carl Sagan's *Cosmos* and its bearing on eco-critical debates especially Christopher Hitt's notion of the ecological sublime.

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⁶ I have not yet decided whether to limit my investigation to popular physics and cosmology books or to include other popular science works about evolution, neuroscience, *etc.*