In the Eye; But Why?

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SPHEX Club Presentation

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The genesis for this presentation, as I recall, occurred while sitting on a rock adjacent to a mountain stream.

"W*herever the trout are, its beautiful."* Thomas Masaryck

Or maybe it was in the middle of the James River.

In either case, as is often the case, I wasn't fishing; my fly rod rested on my lap.

"Many go fishing all of their lives without knowing that it is not fish they are after."
Henry David Thoreau

That's enough about fish and fishing; that's all you are going to hear from me about that in this presentation.

The point is, I was enjoying the beauty of the outdoors, the woods and the stream, or the river. And the thought crossed my mind, "Why is this beautiful?" Or, "Why do I think that it is beautiful?" "What is beauty, anyway?"

Those thoughts stuck with me and, despite my consideration of a couple of other topics for my SPHEX presentation, this one got traction.

My preparation started as a thought piece. I don't consider myself a deep thinker, I'm not very contemplative. I am a fairly good technical writer, able to communicate facts and explain things. But I rarely wander into philosophy or the arts where measurable facts seem less relevant, and I don't consider myself either very imaginative or creative. So, I realized that this might be somewhat of a stretch for me, but what the heck, it's my ninth and maybe my last SPHEX presentation, and I couldn't get any traction with the other topics.

Here is an overview of the thoughts and questions that informed this presentation.

- Why is something beautiful?
- Is it beautiful intrinsically, in and of itself? Is it beautiful because I think or feel that it is beautiful? Is beauty a decision, …a perception, thought, or feeling?
- Is something beautiful even if it is not seen? Is beauty merely a human construct?
- Is there a difference between "that's beautiful" and "that's nice?"
- Is beauty subjective or are there objective standards, some commonality to beauty?
- Can beauty be measured, and if so, by what standards?
- Why is something "more beautiful" than something else similar or dissimilar? Is beauty comparative or relative? Is it dependent on something else?
- Is beauty situational – does it depend? Does our perception of beauty depend on our state of mind or physical condition? Does it take awareness, focus, perception, and appreciation? For example, sand dunes in a desert may be beautiful to see as a tourist but one may have a different perception if lost in the desert and dying of heat exhaustion and thirst.

- Can something that is common and routine be beautiful sometimes?

- Why am I struck by "beauty" and you are not? Is beauty truly, and only, "in the eye of the beholder?" Why?

"*Beauty is in the eye of the beholder.*"
Margaret Wolfe Hungerford

Let's get this out of the way right up front. When I mentioned to family and friends that I was preparing a presentation on beauty, the immediate comment that I received in response was, "Beauty is in the eye of the beholder." So, I just want to put it out there. But, is this a true statement?

I am sure that many of you have experienced the phenomenon that when you have decided on a topic for a SPHEX paper the universe starts to send potentially relevant and interesting information your way.


12/3/25, 5:37 PM Catholic University of America professor receives $3.89 million for study on beauty | Catholic News Agency

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Catholic University of America professor receives $3.89 million for study on beauty

Credit: Trevor Owens via Flickr (CC BY 2.0)

By Madalaine Elhabbal

Washington, D.C. Newsroom, Aug 30, 2025 / 08:00 am

https://www.catholicnewsagency.com/news/266255/catholic-university-professor-receives-3-dollars-89-cents-million-for-study-on-beauty?utm_campaig... 1/6

In August 2025, it was reported that a Catholic University of America sociologist, Professor Brandon Vaidyanathan, had received a $3.89 million grant from the John Templeton Foundation for a "first-of-its-kind large-scale, international study of beauty." The multi-year

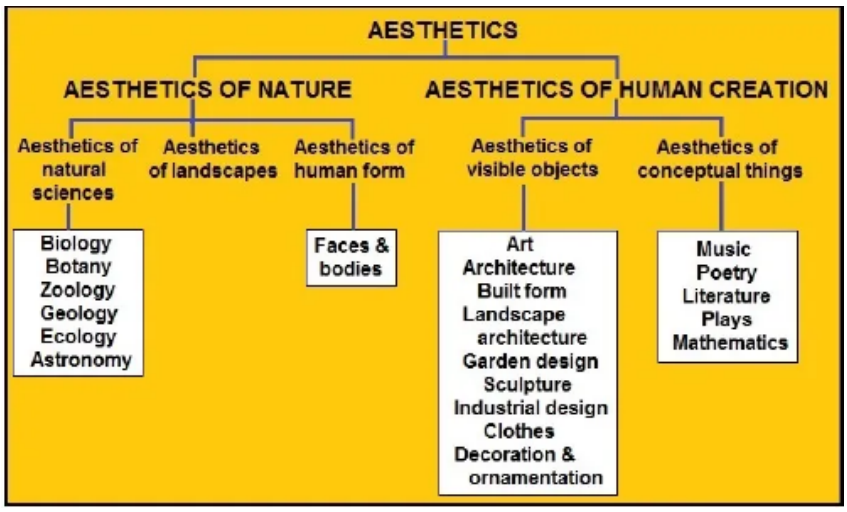
study will center on understanding how experiences of beauty generate "a sense of meaning and transcendence." The study's title is, "Can Beauty Save the World? Aesthetic Engagement Among the Spiritual But Not Religious," referring to a statement in Fyodor Dostoyevsky's novel, The Idiot, that, "Beaty will save the world." According to the press release,

> *The research will span disciplines including literature, neuroscience, philosophy, psychology, and sociology to better understand how individual and collective experiences of beauty may contribute to creating a sense of meaning and transcendence. The target population is the 'spiritual but not religious,' a rapidly growing demographic that seeks alternative avenues for transcendence in a secular age.*

The research will focus on the United States and the United Kingdom and will include the employment of wearable technology to measure the physiological impact of aesthetic engagement, hoping to generate "new insights into the relationship between beauty, well-being, and spirituality," and "to spark a global conversation about beauty in the many ways it is manifested as essential to human flourishing."

As fascinating as that is, and although $4 million is tempting, it is a little too much for a SPHEX presentation. There are many different manifestations of beauty – physical, natural (animal, vegetable, mineral), human, built, panoramic and microscopic, an idea, art, music, math, poetry or prose; animate or inanimate. I needed to narrow the scope down; to get back to that mountain stream.

Dr. Andrew Lothian, an Australian practitioner in landscape quality assessment, has written extensively on "scenic quality," including the philosophy of beauty, or what he refers to as "aesthetics." Here is his "Taxonomy of Aesthetics."



My focus is on what he calls the “aesthetics of landscapes.” That is, natural beauty perceived and experienced outside, relatively unaltered by human manipulation. I am thinking about the vistas, the landforms, the places, and the ephemera, of the outdoors.

Coincidently, again, in September I came across an article from Travel + Leisure announcing that a national park in Spain had been named the best panoramic view in the world. I had to follow up. [Slide #9] The national park is Ordesa y Monte Perdido (Lost Mountain) National Park in Aragon, Spain. The park is a UNESCO World Heritage Site featuring dramatic valleys, forests, and meadows, crowned by Monte Perdido, the third highest peak in the Pyrenees. This national park was one of twenty “top views of the world” picked by award-winning travel and wildlife photographer Bella Falk.

Here are the top five.

1. Ordesa y Monte Perdido National Park, Spain

2. Peyto Lake, Banff National Park, Canada

3. Lake Atitlan, Guatemalan Highlands

4. Ait Banhaddou, Morocco

5. Machu Picchu, Peru

Number 7 is White Sands, New Mexico (see page 3 above), and is the only site in the United States.

According to the Cewe website (a U.K. photography website), Ms. Falk's picks are based on "visual impact, variety, and accessibility." She said, "*The best panoramas have scale, so you're sucked in by the landscape but also have anchor points to draw your eye in, such as a river or jagged peak. The best views are emotionally powerful and give you that moment of stillness, scale, and perspective that makes you want to stay and watch for longer*."

The Travel + Leisure website also had a link to an article identifying the fifty-one most beautiful places in the United States. I don't know who selected them, but can you guess what was selected for Virginia? It was the Blue Ridge Parkway.

I appreciate that Travel + Leisure picked a view in our backyard (kind of), but there are better views and I want to share one of my favorite views.

Considering the photographs that you have just seen, and if you think that any or all of them are beautiful, or at least have some beauty in them, can you say why?

Here are some suggestions. The photographs may be visually appealing; they may offer a combination of color, contrast, symmetry, order, or wholeness that may resonate with the observer. Are these objective characteristics? Can they be measured? I think that they can be to some degree.

But these are just photographs and the observer's experience with them is only two-dimensional. It's not like being there is it? That's one of the challenges of some landscape assessment processes. A photograph only engages your sense of sight. Other senses, hearing, touch, smell, and even taste come into play when you are actually present in the place; and, those senses might add or detract from the experience of beauty.

The experience of beauty goes beyond the senses to an emotional or spiritual level, to a feeling of awe. Standing on Rocky Row, with a vast expanse in front of you, you get a glimpse of where you stand in the universe. It's hard to get that from a photograph.

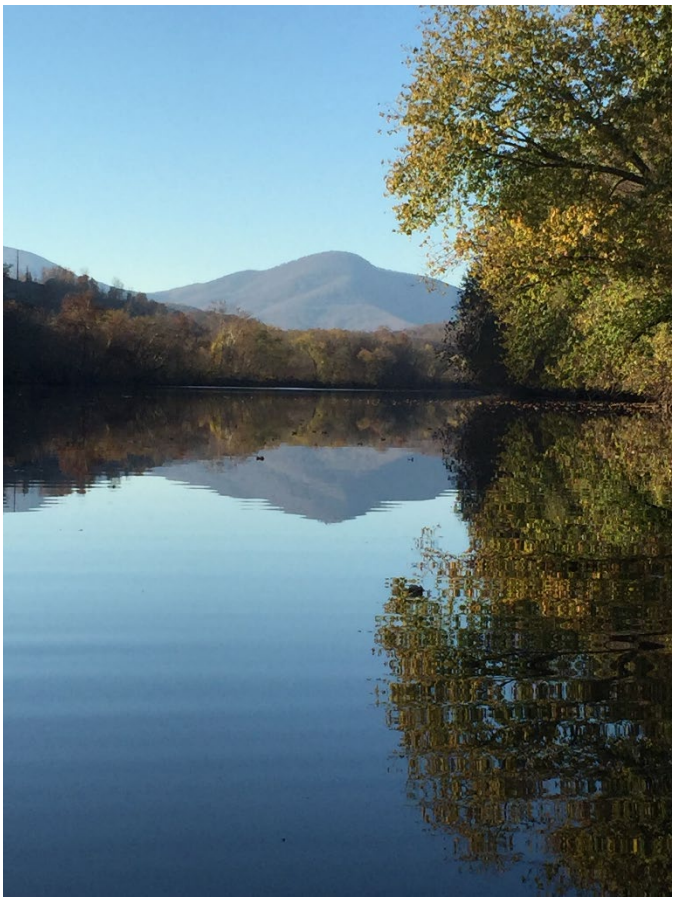
Another question; do the human artifacts present in most of the photographs add or take away from the sense of beauty?

That is as far as I got in my thinking about the topic of beauty. Inevitably, but reluctantly, I went to the internet to do some research, test my theories, and find some answers. Much to my surprise, but to none of you, I found that my musings were not original. The questions that it took me seventy years to ask have been debated for millennia. Seeking the answers led me into many disciplines in which some of you listeners/readers are much more knowledgeable than I; philosophy, religion, art, photography, psychology, mathematics, physics, neuroscience, and even artificial intelligence.

First, I went to the Oxford English Dictionary for the definition of beauty. There are eighteen meanings listed. That should tell you something about the challenges of trying to nail down this topic. Here are two that I liked the most :

> *1. Such combined perfection of form and charm of colouring as affords keen pleasure to the sense of sight (in the human face or figure; or of other objects).*
> *2. That quality or combination or qualities which affords keen pleasure to other senses (e.g., that of hearing), or which charms the intellectual or moral faculties through inherent grace, or fitness to a desired end.* (OED, Compact Edition, 1971)

The Cambridge Dictionary defines beauty as "the quality of being pleasing and attractive, especially to look at." Other definitions indicate that beauty pleases the aesthetic senses, or the mind. The idea that a defining attribute of beauty is that it affords pleasure is a theme of what I later learned is the "Hedonistic" concept of beauty. Saying that beauty is something that pleases the senses seems a little pedestrian. I think that beauty should have more of an impact – it should trigger awe, a visceral or a spiritual reaction; even fear. This deeper impact, beyond the picturesque or the beautiful, is referred in the literature on beauty to as "the sublime."



A major source for my presentation was Crispin Sartwell's discussion of beauty in The Stanford Encyclopedia of Philosophy. In his introduction, Mr. Sartwell says:

> *The nature of beauty is one of the most enduring and controversial themes in Western philosophy, and is—with the nature of art—one of the two fundamental issues in the history of philosophical aesthetics. Beauty has traditionally been counted among the ultimate values, with goodness, truth, and justice. It is a primary theme among ancient Greek, Hellenistic, and medieval philosophers, and was central to eighteenth and nineteenth-century thought, …. By the beginning of the twentieth century, beauty was in decline as a subject of philosophical inquiry, and also as a primary goal of the arts.*

Sartwell's article addresses "some of the major approaches to or theories of beauty developed within Western philosophies and artistic traditions."

Is Beauty Objective or Subjective?

"The single most prosecuted disagreement in the literature" about beauty is the debate over whether beauty is objective or subjective. (Sartwell) You might say, well of course, we all know that "beauty is in the eye of the beholder." But, can't we also acknowledge that "*there is a perception of beauty, born instantaneously, which establishes itself as indisputable and compelling fact, and leaves no room for any internal objection. It constitutes an immediate reaction of the whole being, independently of all forms of culture.*" (Quere) Is that an objective quality?

The exploration of beauty involves engagement with two entities; the thing that is beautiful, and the beholder, or the perceiver, of that beauty. It reminds me of the question, " If a tree falls in the forest, does it make a sound?" Can something be beautiful if there is no one to perceive it?

Whether you think beauty is objective or subjective may depend on your focus; on the thing or on the perceiver. Over time, we have shifted that focus more on the perceiver. The classical concept of beauty, up until about the 18th century, held that beauty has an objective quality; it is inherent in the object itself or the qualities of that object. Augustine suggested that things give delight because they are beautiful. Plato and Plotinus locate beauty in the realm of the Forms and speak of the ideal form – a "harmonious coherence" of parts that produce a unity of order, proportion, and symmetry.

To some, this sense of order came from a creator who created a beautiful world to reflect his own nature. In other words, the beauty of the world is grounded in God's beauty (Tyrer).

Another explanation for beauty being inherent in nature is evolutionary psychology, which explains that the human brain has evolved for reproductive fitness and that we perceive beauty in places that are conducive to our wellbeing (such as savannahs, and river valleys). This doesn't explain, however, why we also find beauty in harsh environments, deserts, mountains, and arctic tundra that are not conducive to reproduction.

One commentator concludes: "*Nevertheless, beauty does strike us as an objective feature of the world. Perhaps any argument against this viewpoint would be a more complex position than the simple acceptance of objective beauty. Given that the simple viewpoint is to be preferred, it may be that objective beauty is always with us.* (Tyrer)"

Human beings, however, don't seem inclined to unquestionably accept simple viewpoints and more complex positions abound; positions that today are more predominant. Even the classical concept of beauty acknowledged its power to give pleasure to its perceiver.

Around the eighteenth century, influenced by philosophers such as David Hume, John Locke, and Immanuel Kant, discussions on beauty focused more on the perceiver than on the object. Hume said, "*Beauty is no quality in things themselves: it exists merely in the mind which contemplates them; and each mind perceives a different beauty.*" (Sartwell) Locke found beauty to be "*a set of qualities dependent on subjective response, located in the perceiving mind rather than of the world outside the mind.*" (Sartwell)

A problem arises, however. If beauty is entirely subjective, "if anything that anyone holds to be or experiences as beautiful is beautiful, then it seems that the word has no meaning." (Sartwell) Hume and Kant suggest that " if beauty is completely relevant to individual experiences, is ceases to be a paramount value." (Sartwell)

We are faced with a paradox, what is referred to as "the antinomy of taste," – a contradiction between two beliefs or conclusions that are in themselves reasonable." Beauty, or taste, is obviously subjective, yet we often argue about it and as a society we recognize both exemplars of good taste and tastelessness. Furthermore, as already suggested, we recognize that some objects, landscapes, sunsets, etc. have a similar effect of pleasure or awe on nearly everyone.

Hume and Kant address this paradox by acknowledging the validity of those exemplars of taste, "the critics," who help us determine what is beautiful or tasteful. When there is near unanimity of critics, that stands the test of time, (for example, regarding the Mona Lisa or Michaelangelo's David) does that judgment gain some objectivity?

Another point – Kant argues that the judgment of beauty is a disinterested judgment, that the perceiver has no utilitarian purpose in mind, they are indifferent to the existence of the object, and therefore can render a pure, impartial judgment. Furthermore, Kant says that such judgments have a universal respect in that "anyone similarly situated ought to have the same experience and reach the same judgment." (Sartwell)

This brings another aspect into the discussion of beauty; the acknowledgment that there is a social and cultural aspect to the perception of beauty – that the judgment is "inter-subjective." The literature that I found focused mostly (with one exception) on Western perceptions of beauty and not on Eastern or Indigenous cultures. Here is an attempt by Dr. Andrew Lothian to capture in a single graphic all of the "realms of Western landscape influences" that shape people's perceptions of landscape quality or beauty.

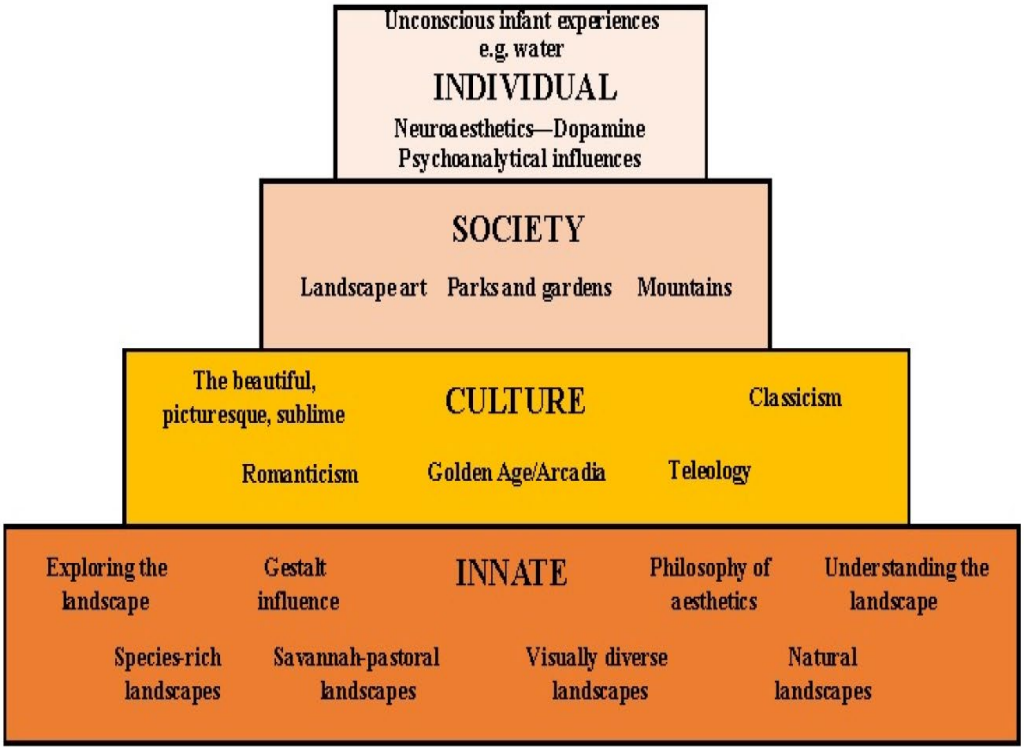


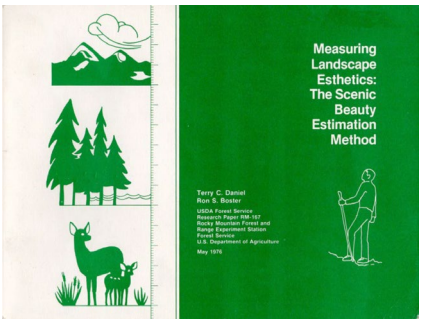
Figure 3. Realms of Western landscape influences.

Some of these we have already touched on, but I want to mention another one that I found to be particularly interesting. In the late eighteenth century in Britian the concept of the "picturesque" became popular. According to Elizabeth Scarbrough, "What Makes Nature Beautiful?," "*This 'landscape aesthetic' assumes that one ought to employ a mode of aesthetic appreciation of the natural environment that is informed by the practice, and aesthetic criteria of, landscape painting.*" That seems backward to me, but it gets even stranger. Eighteenth century landscape painters used devices such as the "Claude glass" to help frame the scene they were planning to paint.

The Claude glass became so popular that tourists would carry them to view landscapes without any intention of painting them.

Measuring Beauty

The general agreement that the perception of beauty is subjective, or inter-subjective, hasn't stopped researchers from trying to find ways to measure it. One of the oldest attempts to measure beauty that I found was the work of Terry Daniel and Ron Boster who, in 1976, published a USDA Forest Service research paper titled, "*Measuring Landscape Esthetics: The Scenic Beauty Estimation Method.* Their work still informs efforts to assess landscapes for scenic quality or value.



Daniel's and Boster's work arose out of the environmental movement of the 1970's when policy makers were trying to find a balance between resource extraction and development and environmental preservation in the planning and management of public lands. There was an effort to balance or integrate the traditional economic concerns around timber, forage, and water with what the authors referred to as the "less tangible products" of esthetics, wildlife, and recreation. The goal was to provide an objective measurement of those less tangible products that could also be considered, along with economic goals, in land use decisions. Many of today's efforts at landscape assessment are intended to help inform public policy decisions.

Acknowledging that "…beauty is only partially defined by characteristics of the environment, and depends, in large part, upon human judgment," (an "interactive" process "where scenic beauty is inferred from a judgment made by a human observer in response to his perception of a landscape") Daniel and Bostic developed a technique for measuring scenic beauty in terms of public perceptual judgment using photographs and ratings by volunteers. Ratings, on a scale of 1 to 10, were gathered for different landscape configurations, statistically analyzed for different groups of observers, and then ranked to provide a comparative indication of importance or value. This early effort to commoditize scenic beauty to assist policy makers with the inevitable trade-offs of land use decisions has been the basis for increasingly sophisticated approaches.

Doctor Andrew Lothian, who I have already mentioned twice, has developed a process that he calls the "Community Preference Method." Dr. Lothian is the director of Scenic Solutions, "an Australian-based consultancy which offers services in measuring and mapping landscape quality, in assessing the visual impact of proposed developments and activities, and in formulating policies to protect, manage and enhance landscape quality." Lothian prefers to use the term "landscape quality" rather than scenic beauty or other designations and he has written extensively on the philosophies and theories of scenic aesthetics and on the influences, in Western thought, on landscape quality preferences.

Lothian comes down squarely in the camp that "landscape quality" is a subjective quality but, he insists that it can be objectively measured. His website is subtitled, "The Science of Scenery." He says, "Because landscape quality derives from our senses, our perceptions, it is inherently subjective. However, this does not mean that it cannot be measured and understood objectively."

Here is Dr. Lothian's definition of "Landscape Quality:" "*Landscape quality is the human subjective perception, both positive and negative, of the physical landscape, responding to its land forms, land cover, land uses, the presence of water, and other attributes."*

Thus, he says, *"Landscape quality is not the physical contents of the landscape but rather our mind's interpretation of it. Rather than say, "It is a beautiful landscape," we should say, "I think it is a beautiful landscape."*

Nevertheless, Lothian says that landscape quality has the following characteristics:

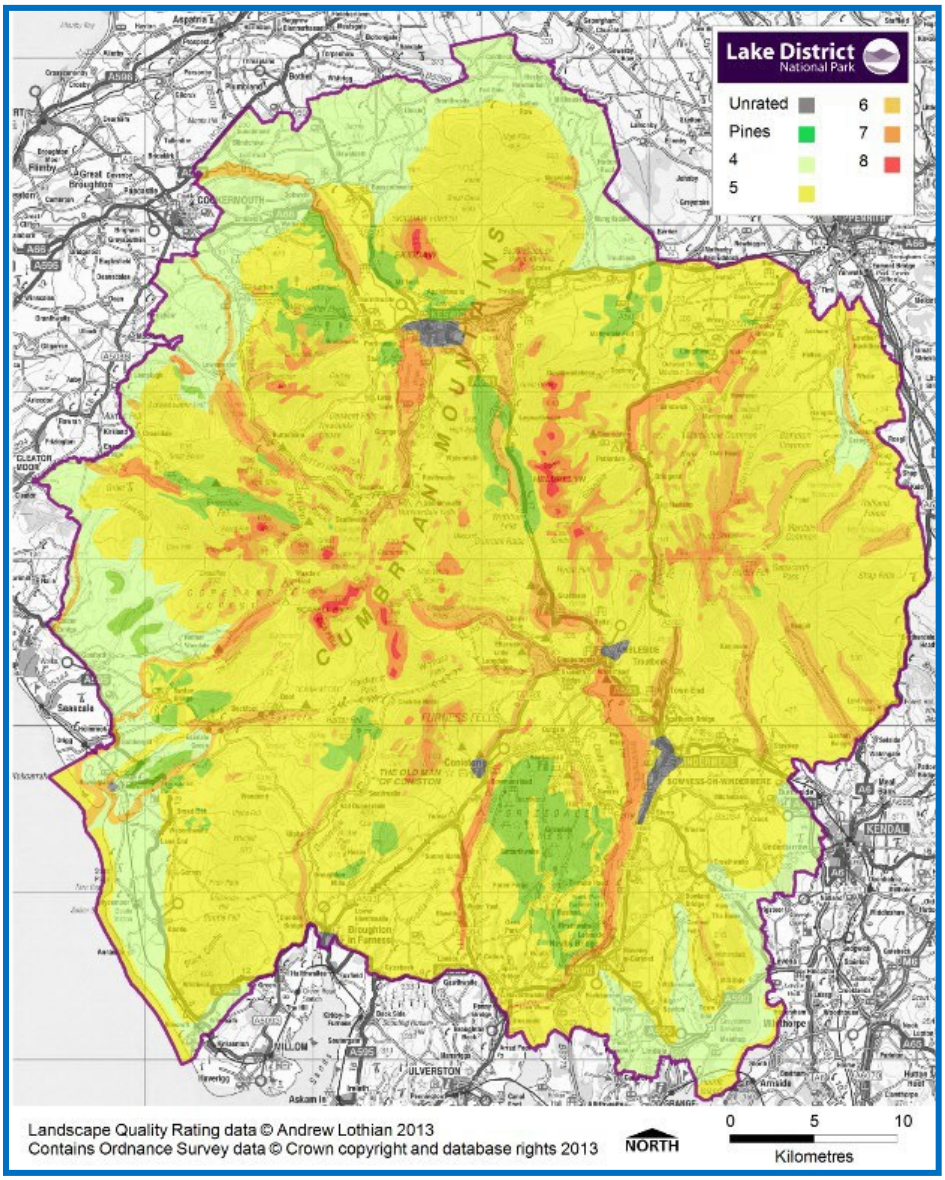
- It is a public good, not privately owned
- It is not diminished by use
- It can be changed but is never destroyed
- It is a qualitative resource and therefore requires human perception for its measurement
- It exists whether or not the area is accessible for viewing
- It is an environmental resource of community value
- It has no immediate useful purpose – it is not utilized to attain some higher good (a Kantian concept)

Landscapes can be natural, without human interaction, or manipulated and changed by human activity.

Dr. Lothian criticizes earlier efforts to measure scenic quality for using the wrong paradigm. He says:

> *These attempts sought to measure the landscape's biophysical attributes: land slopes, aspects, soils, geology, biodiversity, geomorphology, rivers, lakes, and its views and highlights, all in the expectation (and hope) that somehow out of all this analysis, its inherent landscape quality would emerge. It never did. An issue was that the factors assessed varied from person to person.*
>
> *The failure occurred because analyzing the landscape objectively is a cognitive process of the brain, involving observation, measurement, analysis, and synthesis. In contrast, assessing qualitative values, its scenic quality, is an affective process involving one's likes and dislikes, our preferences, and is inherently subjective. Qualitative values must be assessed by studying preferences, not by analyzing the components.*
>
> [looking at the whole – like the Classical approach]

Despite its subjective quality, Dr. Lothian insists that scenic quality can be objectively assessed. He says that the key is to utilize the science of psychophysics, "measuring the effect of external stimuli via our senses on the brain." Lothian credits a long list of academics and practitioners with developing the "science of landscape quality assessment" and offers his application, a 12-step method that "involves using community preferences to measure scenic quality and, through analyzing the results, mapping it at a regional scale." [Lake District, United Kingdom]


Lake District
National Park
Unrated
Pines
4
5
6
7
8
CUMBRIAN MOUNTAINS
KENDAL
ULVERSTON
Landscape Quality Rating data © Andrew Lothian 2013
Contains Ordnance Survey data © Crown copyright and database rights 2013
NORTH
0
5
10
Kilometres

Dr. Lothian's Community Preference Method is not unlike that of Daniel and Boster. It uses standardized scenes of a region and then surveys respondents (hundreds), asking them to rate the views "scenic attractiveness" on a scale of one to ten (1= very low, 10= very high). The survey also gathers demographic information (age, gender, education), residence and familiarity. Then the method uses statistical analysis (including regression analysis, standard deviation, etc.) to develop ratings of landscape quality which are then represented graphically.

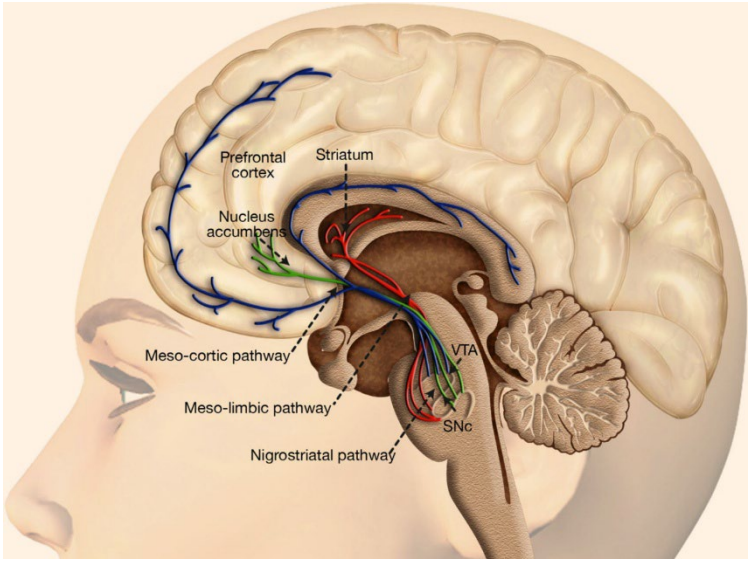
One of the things that struck me about Dr. Lothian's approach was that, although he claims to use the science of psychophysics (measuring the effect of external stimuli on the brain), there seems to be little actual science along those lines.

I found some information, however, on the use of science to measure beauty and use the results to inform design decisions in landscape and building architecture. Simon Aldous, in an article titled, " How scientists are measuring beauty in the beholder," on *The Developer* website, reported that "a growing number of researchers are using visual eye tracking, skin conductance and electrical activity in the brain to quantify beauty through its impact on the human body." He says that the researchers insist that beauty can and should be measured and cites studies that link personal happiness and better health to an aesthetically pleasing environment.

Another article, "The neuroscience of beauty: What your brain finds beautiful – and how this shapes your thoughts," by Ceri Perkins, on the *BBC Science Focus* website, wades into the subjective/objective debate. Perkins says:

> *Much of what we find beautiful is highly subjective. However, experts who have interviewed large numbers of people and analysed some of the world's most revered works of music, art, and architecture have identified common attributes among the things we find beautiful. These universal qualities include simplicity, pattern, rhythm, symmetry, certain juxtapositions of colour, specific combinations of musical notes and physical elements arranged in certain ratios and geometries.*

She reports that neuroscientists, using a brain-imaging fMRI scanner on volunteers, determined that the experience of beautiful images (or music) was related to activity in the medial orbitofrontal cortex of the brain, an area that plays a role in feelings of reward and pleasure. Other studies have identified that part of the brain known as the striatum, also involved in reward and judgment, responds to beautiful faces.



Her article included this, which led me down a couple of side paths:

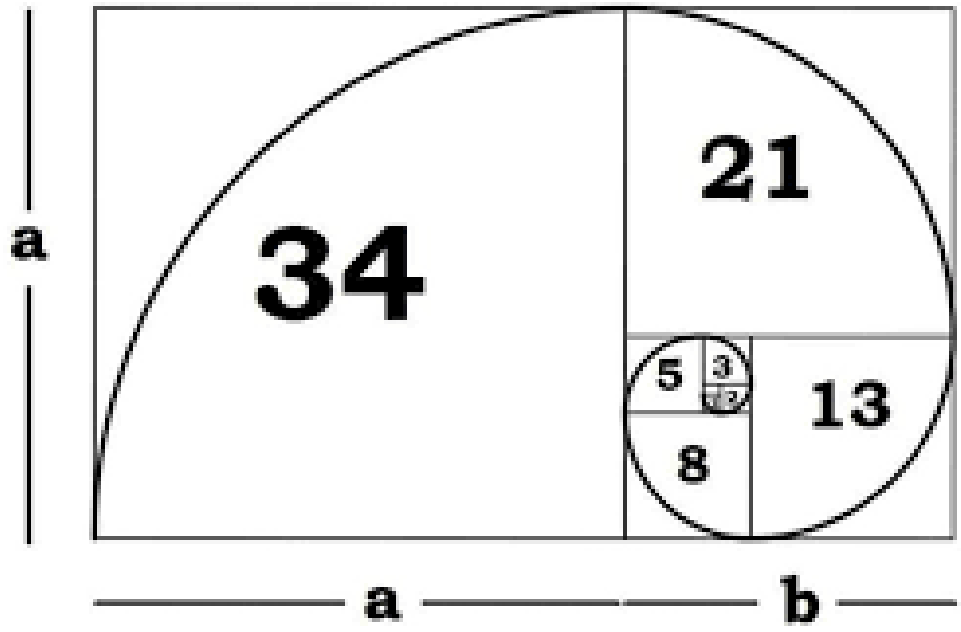
But why do we experience beauty at all? Does it have a purpose? The leading theory is that we're hardwired to appreciate forms and patterns that are pervasive in nature, such as fractals, the Golden Ratio and symmetry, because they helped our ancestors survive.

A symmetrical face, for instance, suggests good health and strong genes in a potential mate. Our brains recognise plants that grow in fractal patterns as healthy and safe to eat, and make us wary of those that grow askew. Things that help us survive activate the reward centre in our brain, inducing feelings of pleasure and, in doing so, cause us to attach value to them.

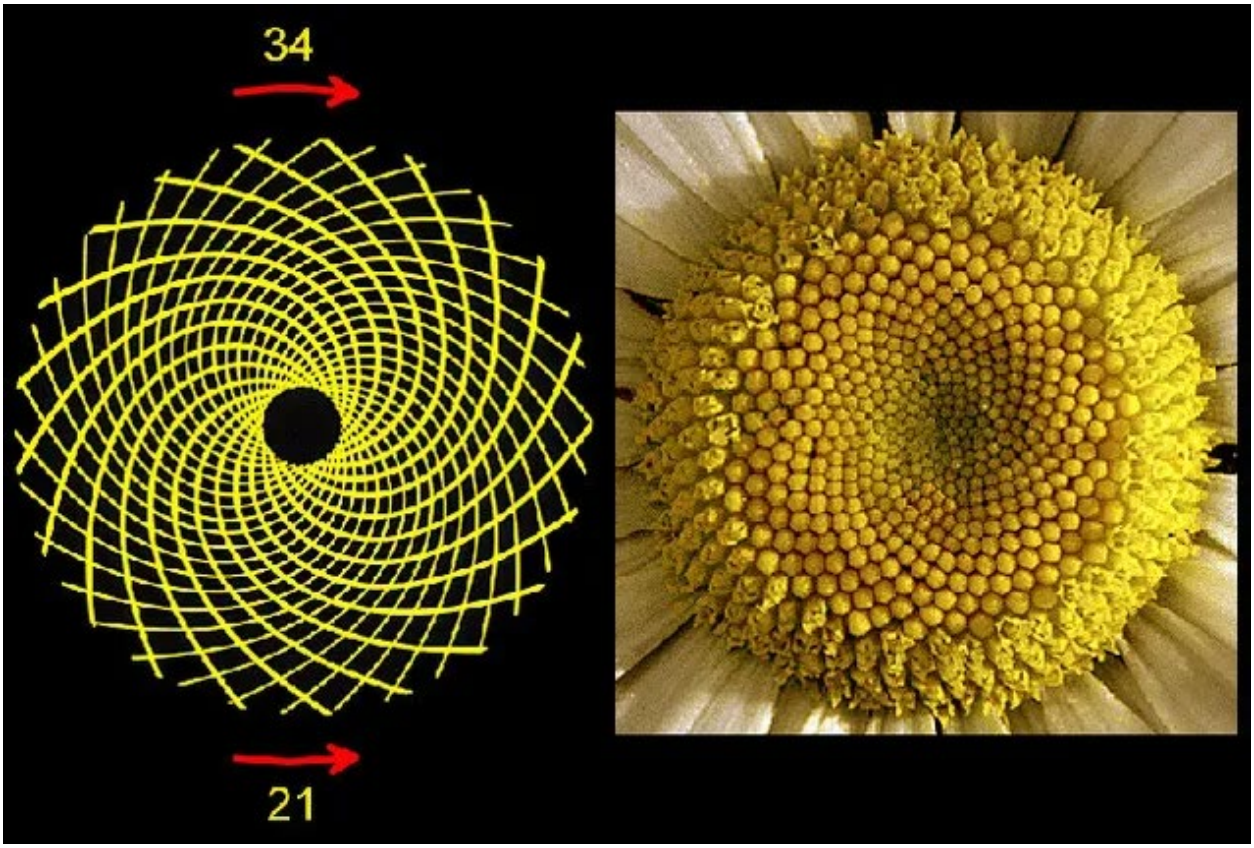
"Golden Ratio?" Fractals? I had to investigate.

I actually first encountered the Golden Ratio, or the Golden Mean (or Golden Section), in my reading about classical interpretations of beauty. According to the Stanford Encyclopedia of Philosophy (Sartwell), *"The classical conception is that beauty consists of an arrangement of integral parts into a coherent whole, according to proportion, harmony, symmetry, and similar notions."* This idea was familiar to Aristotle, Plato, Plotinus, and Thomas Aquinas and carried into the Italian Renaissance with its focus on "perfect proportion" in art, sculpture, and architecture.

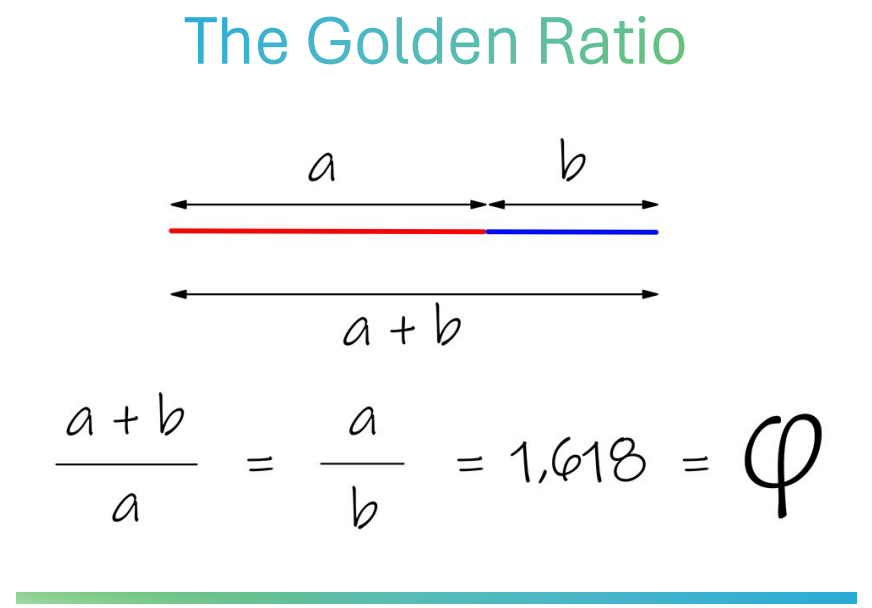
To understand the Golden Ratio, we need to get into mathematics a little. The ratio is based on Fibonacci numbers, which is an infinite series of the sums of the preceding two numbers (0,1,1,2,3,5,8,13,21,34…).



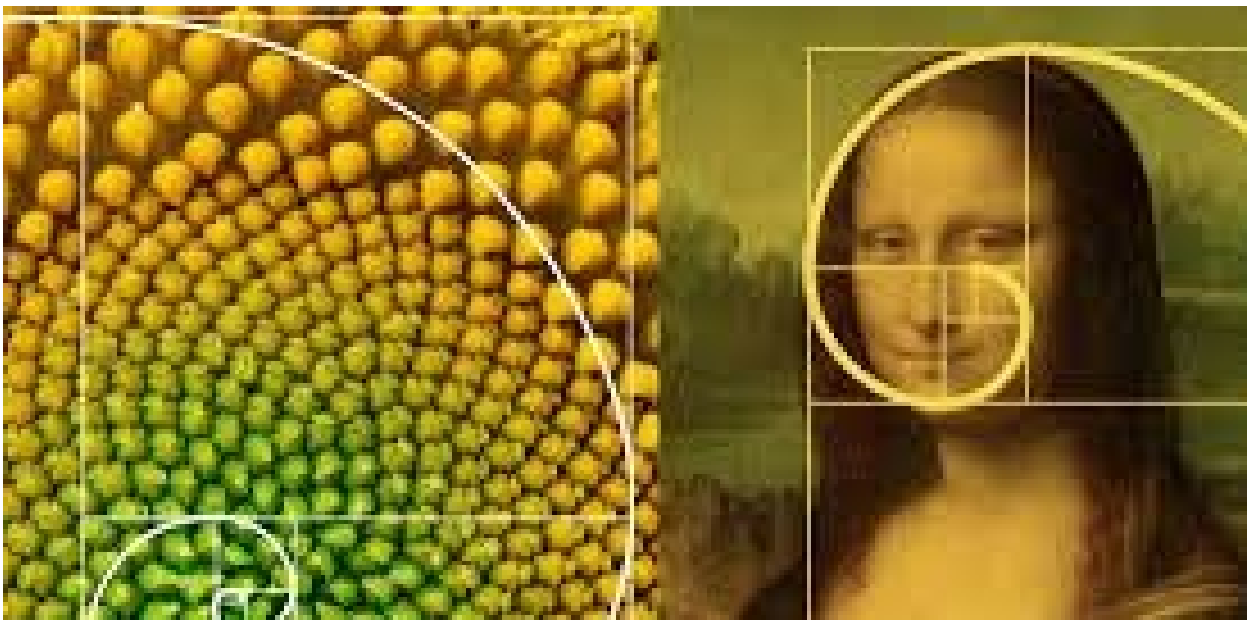
Fibonacci numbers are common in nature, for example, in the spiral arrangement of a pinecone or a sunflower.



The Golden Ratio was determined by comparing a Fibonacci number (for example, 34) to the two numbers that compose it (13 & 21). "*Two quantities are in the Golden Ratio if their ratio is the same as the ratio of their sum to the larger of the two quantities. (or, a+b is to a as a is to b)*" (Wikipedia). There is a quadratic equation involved that is beyond me so you will have to take my word for it that the ratio is an irrational number (like Pi) with a value of approximately 1.618…. It is represented by the Greek letter Phi.

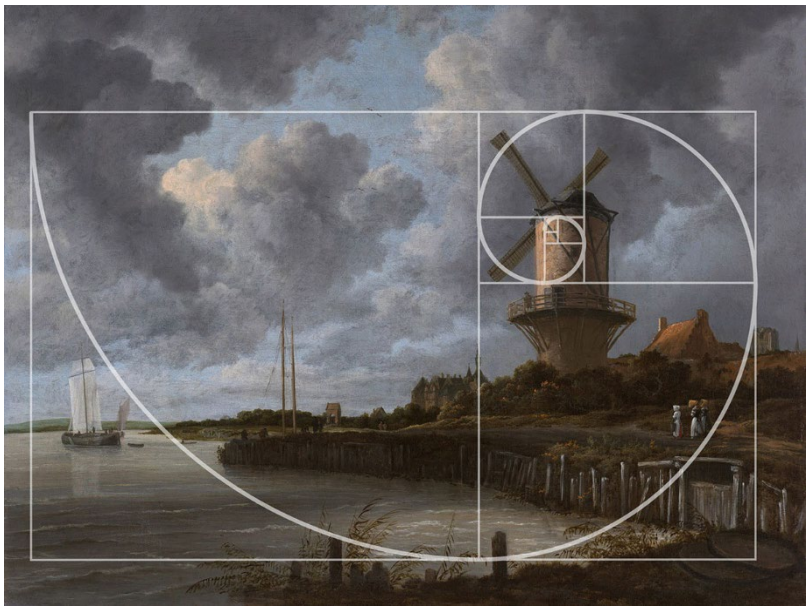


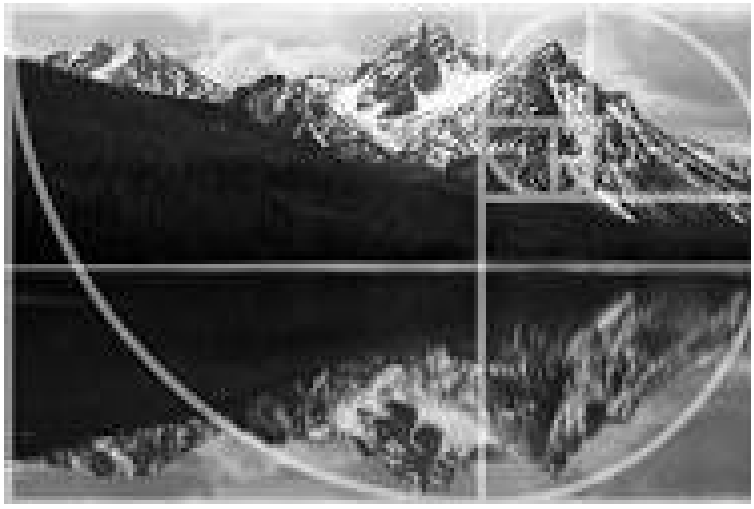
The argument is that this ratio shows up in nature and is emulated in art and architecture to make aesthetically pleasing creations.



The Golden Spiral

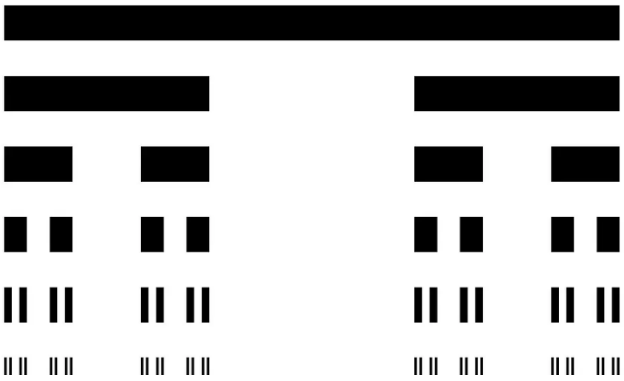
The Golden Ratio in Architecture



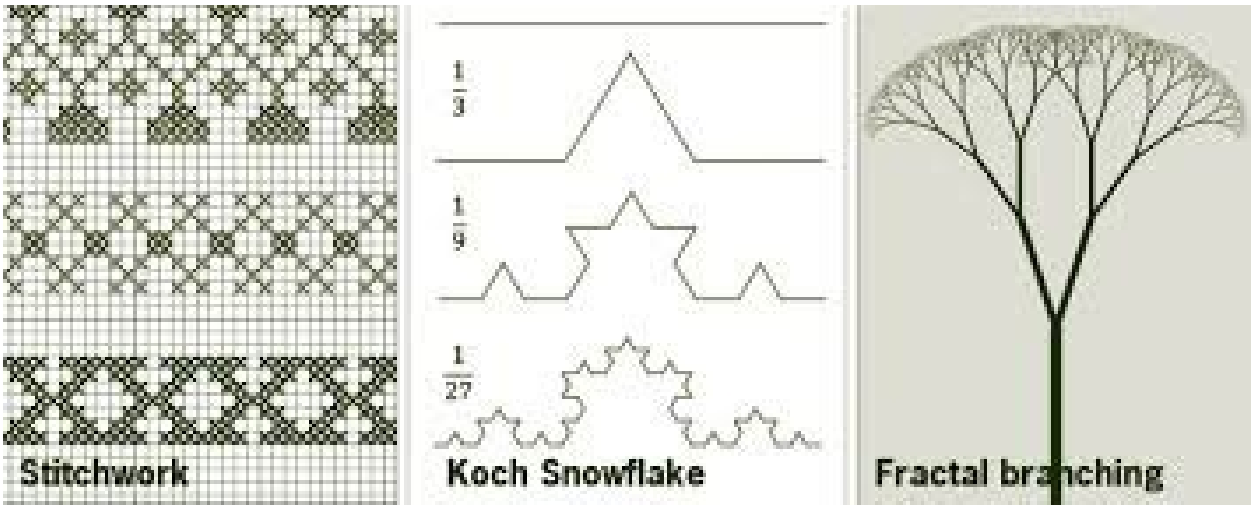


I will make just a couple of points before moving on. One, although useful in design, sometimes it seems like the golden ratio or Fibonacci spiral is forced onto nature. Second, with respect to nature, it should be obvious that the ability to see a spiral is dependent on one's aspect or vantage point when viewing a landscape.

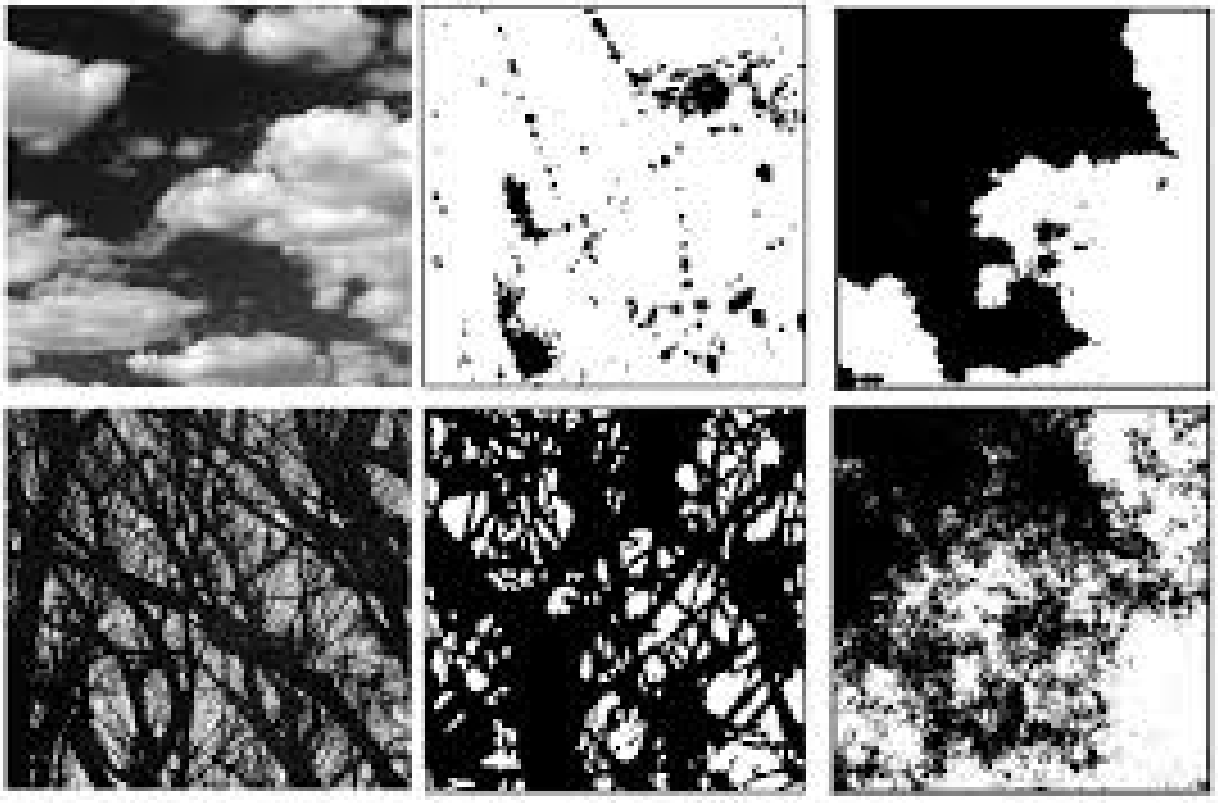
So, what about fractals? *"A fractal is a generally self-similar pattern, repeating its structure over and over again, across different scales. In other words, as you go deeper into a fractal, you will come upon another shape that resembles the whole, and the process is repeated in a loop indefinitely."* (Jarin, "Simplicity in Complexity")



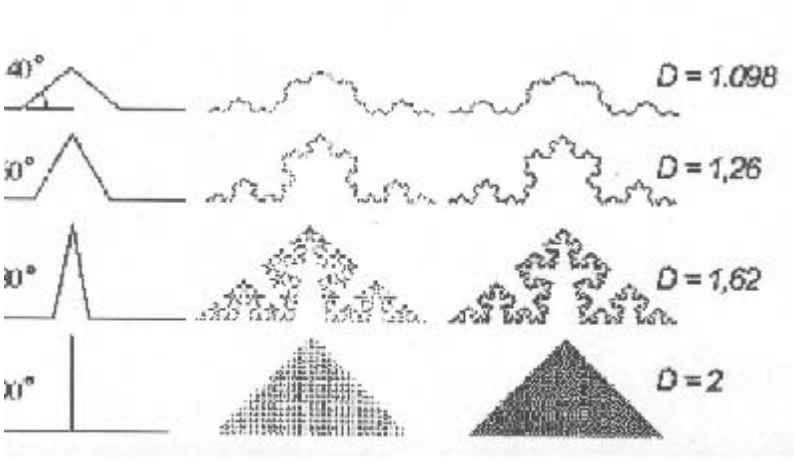
Cantor Set – A Simple Fractal



It is relatively easy to see fractals in nature, such as in the branching of a tree, clouds, river systems, and coastlines.



Aldous Simon in his article that I referred to earlier reported that, “researchers found that humans overwhelmingly prefer fractal images with a dimension (the measure of fractal complexity) between 1.3 and 1.5 (on a scale of 1-2).” (He attributed the popularity of Jackson Pollock’s poured paintings to the use of fractals that closely mimic the complex patterns of nature.)



Fractal Dimension

This seems to me to be somewhat consistent with Dr. Andrew Lothian's findings that views with more components (quality, tranquility, height, diversity, etc.) rate higher in landscape assessments, but only significantly for the first three or four. (Lothian, "Measuring & Mapping Scenic Quality…") After that the ratings are fairly consistent, even up to ten components. It seems that we humans like complexity, up to a point.

Here is an example of the use of fractals in landscape design.

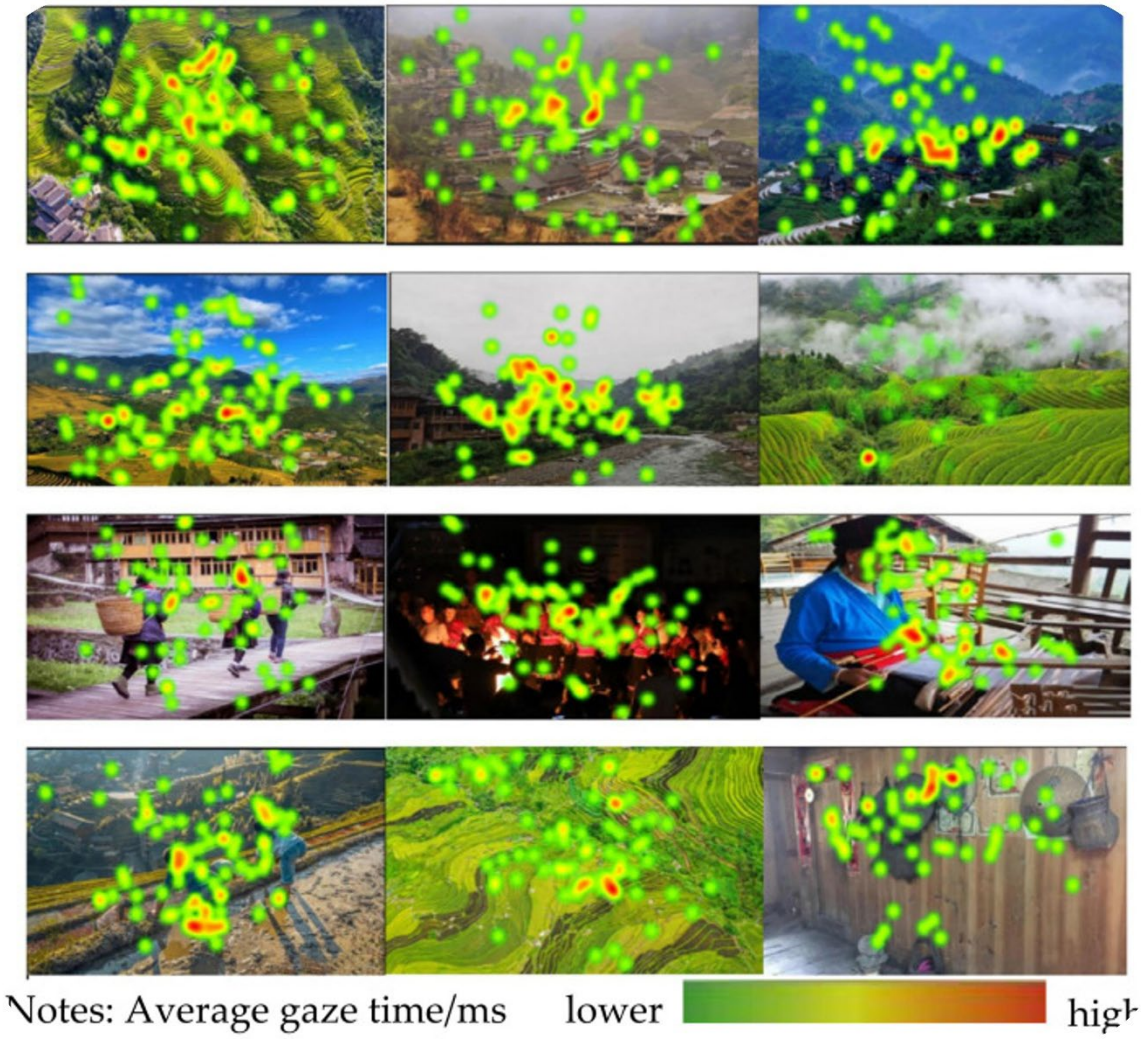
The Ryoanji Rock Garden in Japan (15th century)

Do you see it? I am not sure that I do.

I found an example of using visual eye tracking to try to quantify aesthetic experience. Chinese researchers were attempting to establish an objective dimension in a visual quality evaluation system. They used on-site questionnaires and then a "stimulus- organism- response (SOR)" model [external factors are the stimulus, the individual's physiological and psychological perception is the organism, and the individual's psychology and behavior are the response] was used to examine the visual stimuli and aesthetic responses perceived by tourists, followed by laboratory eye-tracking to observe tourists' points of attention on the Longji Terraced Fields landscape. (Zhang, et.al.)

Longji Rice Terraces, China

From what I gather, their findings indicated that participants tended to focus on more aesthetically pleasing components of the images, often at the intersections of landscape elements.

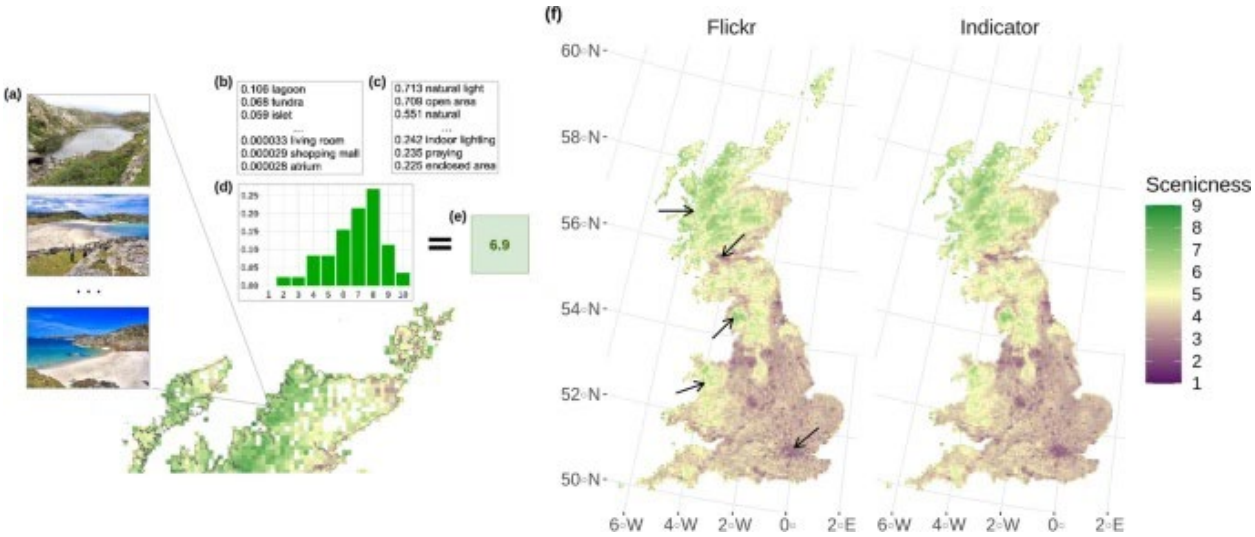


Gaze Time Plots

This brings me to my final examples of measuring scenic quality and they involve crowdsourcing and the use of artificial intelligence. From 2009 to 2005, an organization known as mySociety managed a project called “Scenic or Not.”

The project, based in the United Kingdom (as many assessments seem to be), utilized photographs from around the country and users were invited to go on their website and rate the images on a scale of 1 to 10. According to mySociety, "*The result of this game was a crowd-sourced database, giving an aggregate 'scenicness' rating for every square kilometre of Great Britain.*" The site had about 200,000 images and although the original mySociety site is no longer active, the "game" is now being hosted by the Data Science Lab at the Warwick Business School.

Scientists from the Ecole Polytechnique Federale De Lausanne in Switzerland and Wageningen University in the Netherlands used the Scenic or Not database to train a deep learning AI system and then had it analyze 9 million photos of English landscapes posted on the social network Flickr. They then created a map of the United Kingdom showing areas of color according to their visual attractiveness.



Using AI to Quantify the Beauty of a Landscape

According to the article that I read, the results can be scaled down to much smaller areas. The scientists claim, "*This research provides a technological basis for modelling people's aesthetic enjoyment of the landscape, while incorporating the most important element: people themselves."* In essence, it's a very powerful opinion poll.

Critiques of Natural Beauty Measurements

Sally Marsh, at The Institution of Environmental Sciences in London, has published a critique of natural beauty measurements. Her article also gave some insight into why so many studies seem to be focused on the United Kingdom. Goal Ten of the U.K.'s Environmental Improvement Plan calls for "Enhancing beauty, heritage, and engagement with the natural environment." Marsh says that the data supporting the attainment of that goal is limited and lacking in that it has tended to focus on a few qualities (scenic quality, natural heritage, cultural

heritage, landscape quality, relative wildness, and tranquility), that are difficult to measure, are subject to observer bias, and ignore the experiential or emotional aspect (which she says that laypeople and decision-makers tend to distrust). She says:

> *Scenic beauty assessments are part of a genre of aesthetic preference and landscape quality studies, which do not necessarily share a consistent aesthetic theory or agreed set of definitions and terminology. While there are undoubtedly useful outputs from such studies, it is difficult to claim that they tell us anything meaningful about beauty as an aesthetic value. Beauty is not something that lends itself to easy measurement. As soon as it is ranked or rated it ceases to be about beauty and, instead, tends to become an indication of preference for a different combination of qualities, such as place or image composition.*

Marsh points out that preference studies common in natural beauty research are usually made in an indoor setting looking at a framed image from a fixed distance and require snap judgments. Although such settings offer control of variables, they don't allow for perceptions from of all of the senses and they overlook the emotional engagement that often occurs in nature. Marsh insists that the experience of beauty in nature cannot be captured by a static image because,

> *A natural beauty experience involves a dynamic relationship between perceiver and object. The perceiver is an integral part of the object, not an external spectator, and this holds true even if we are standing on a mountain turning our attention to a specific view. 'Natural (nature)' – or 'landscape/scenic' – are descriptors that encompass and describe the object our senses and cognition engage with in a beauty experience. What distinguishes such experiences as aesthetic ones is the role of positive emotions – described by Immanuel Kant as disinterested pleasure. This is pleasure in nature not linked to any utilitarian purpose such as trading nature for another benefit.*
>
> *In real-world environments, natural beauty is often a prolonged aesthetic experience mediated by movement and exposed to the effects of temporal changes such as light and weather. Like any perceptual experience, beauty starts with engagement of all the senses. As we move, the boundary of what we notice moves with us as the body senses changes in the environment through the skin, constantly adjusting and re-adjusting the detail and scope of what we see and hear.*
>
> Marsh says further:
>
> *Neuroscience describes beauty as an emergent mental state arising from the interaction of three neutral systems: sensory-motor (sensation, perception, motor system); emotion-valuation (reward, emotion, wanting/liking), and knowledge-meaning (expertise, context, and culture). What aspect of the object we engage*

with can differ between moments and between people sharing the same moments. We suspect that the richer an environment is in wildlife and bio-abundance, the greater the opportunities for a deeper natural beauty experience. But the difference in baselines between individuals, cultures, generations, and environments make this a difficult subject to test.

Because of the inherent difficulties in measurement, we create an approximation, a simplified model, underpinned by aesthetic theory, but inevitably excluding critical factors (such as emotions and experience), giving disproportionate weight to others, and ignoring things that are difficult to measure. Nevertheless, due to time constraints and other resource limitations, policy makers tend to look to simple models to provide input into decision making without considering other aspects of aesthetic theory.

Marsh concludes:

Currently, all these models ignore or downplay the dynamic and multi-scaler nature of the object in natural beauty and, in their stand-alone substitution for natural beauty, exclude information on people's experiences of it. An emotional response to nature tends to be distrusted in laypeople and decision-makers in favour of data and expert judgement, which are considered more objective. However, in natural beauty, emotion and the complex interplay between cognition and knowledge are as important as the physical object, suggesting that there is no such thing as an objective assessor.

I came upon a more compelling criticism of trying to use science to define beauty and our perception of it in an article about the limitations of artificial intelligence (Jurland – another SPHEX coincidence). The author argues that science, with its focus on the material, cannot successfully analyze and define essential human concepts such as love, beauty, moral obligation, and human dignity. He cites a thought experiment conducted by the German Canadian neurologist and psychiatrist Carl Stern (1906-1975).

Imagine assembling a research team to study Beethoven's Ninth Symphony. Physicists analyze the sound waves, intensities, and frequencies; psychologists investigate Beethoven's childhood traumas and how he coped with deafness; sociologists examine his choice of Schiller's "Ode to Joy" in the post-Napoleonic political climate; neurologists use functional MRI to map which brain regions are stimulated when subjects hear the choral movement.

Yet as Stern observes, "No matter how much data our scientific team compiled, it could not 'explain' a single bar of the musical experience we call the Ninth Symphony. The problem isn't insufficient data. The problem is categorical: aesthetic experience, meaning, and beauty exist on a plane that scientific measurement cannot access.

This thought experiment is very applicable to the question of how we experience scenic beauty. I don't think that there will ever be a satisfactory scientific explanation of "beauty" and, I think that's a good thing. I am comfortable with the idea that human beings exist on multiple levels, body, spirit, and soul, whose mysteries science alone (even with AI) cannot solve.

Experimenting with Artificial Intelligence

One of my early thoughts in considering this presentation was to experiment with artificial intelligence. I resisted asking ChatGPT, "What is beauty?" but I did ask it if beauty could be measured and how, and I got interesting answers. My main idea, however, was to ask it to generate images and to see what it came up with. My first command was, "Generate a beautiful image of a natural landscape." The result was the AI titled, "Alpine sunrise with vibrant wildflowers."

I then asked, “Using the same image, make it slightly, but noticeably less beautiful.” The result was titled, “Mountain lake with wildflowers and stream.”

Notice the subtle change in language?

Then, I instructed, “Using the same image, alter it to make it ugly.” The result was a “Gloomy mountain lake in late afternoon.”

Finally, I asked ChatGPT why the first image is beautiful and the third image is ugly. It went through a list of differences around light, color, order, contrast, and meaning and concluded:

> *Beauty emerges when complexity feels intelligible and life-affirming.*
> *Ugliness emerges when complexity feels hostile, draining, or pointless.*
>
> *Nothing “objectively” ugly was added to the third image.*
> *What was removed was coherence, generosity, and promise.*
>
> *The absence is what you feel.*

Do you agree?

Conclusion

So, is beauty objective or subjective? Yes; it is both. I believe there is objective beauty inherent in God's creation. It is there for us to experience and enjoy but we don't always perceive it due to a multiplicity of factors, cultural, social, individual, and situational. When we do perceive it, however, we should accept it as a gift. We don't need to try to explain it.

And, I think that we should always be open to the reception of beauty. That to me, implies a necessary component that in all of my research I never found explicitly expressed – time. I think if we just slow down and take the time to look around, contemplate nature, the world, and our place in it, we will find beauty everywhere.

Leaving Holy Cross Church one Saturday afternoon in December, 2025

"And God saw that it was beautiful."
Genesis

Thank you.

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