

**THE AESTHETIC BRAIN:  
HOW WE EVOLVED TO DESIRE  
BEAUTY AND ENJOY ART**

by Anjan Chatterjee. Oxford University  
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I am among those who find the subject of art and the brain fascinating, yet I have never warmed to the field of neuroaesthetics. While it is true that art is ineluctably a function of the brain, I find that, in order to reduce art to modalities that scientific ways of neuroaesthetic investigations can address, scientists inevitably seem to remove key aspects of art from their equations. The primary issue I have with wrapping my brain around the neuroaesthetic approach is that I don't think art is a "problem" we can/will resolve from a neurobiological perspective—and I think this is a

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good thing! That said, I do think science and art in general, and scientists and artists in particular, have something to contribute to our conversations on art and the brain. Given this, I'm glad people are talking across disciplinary lines.

Lately it seems the topic has really struck a chord, with everyone wanting to contribute a new theory, methodology or art project. Anjan Chatterjee's new book, *The Aesthetic Brain: How We Evolved to Desire Beauty and Enjoy Art*, is one of the recent books in the genre. Like many of its siblings from the science/philosophy side of the spectrum, Chatterjee's contribution to the idiom offers much theoretical content based on a large body of science and social science research. Essentially Chatterjee believes "the brain will help us understand the *how* of aesthetics, and frameworks from evolutionary psychology will help us understand the *why* of aesthetics" (p. xv). His underlying assumption is that beauty is integral to how most people think about aesthetics, and thus the book is built around the idea that beauty, pleasure and art are connected. Still, although art is highlighted in the subtitle, *The Aesthetic Brain* is about aesthetics rather than art. Chatterjee writes:

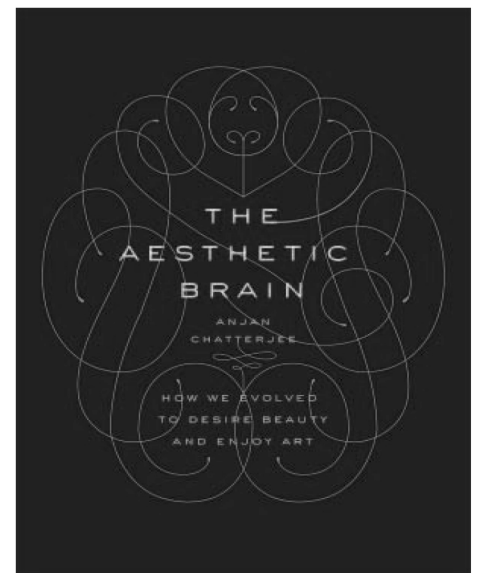
Aesthetics and art are not the same. They are overlapping but different ideas. Aesthetics, as generally understood, focuses on properties of objects and our emotional responses to those properties. The object need not be art per se. . . . Aesthetics typically relates to the continuum of beauty to ugly. . . . Art can and usually does have aesthetic properties. However, the artist's intentions, the art work's place in history, and its political and social dimension are also relevant to art. These aspects fall outside of what we might regard as "aesthetic" (p. 115).

Chatterjee divides *The Aesthetic Brain* into three sections: Beauty, Pleasure, and Art. Each section is comprised of many short chapters

that serve to ask and answer specific questions. The beauty and pleasure sections draw on research studies that are intended to show that we have instincts for beauty and pleasure. For example, his assumption is that most people like art that is beautiful and he presents experimental research to support that we like beauty, symmetry and so on. Next, in order to establish that we have a pleasure instinct, he looks at human behavior in terms of pleasure, offering anecdotes and studies that support the idea that the parts of the human brain involved in positive reinforcement of behavior are also involved in the sensation of pleasure.

Art is the final section. Much of the discussion about art seemed rather abstract and quite unlike Chatterjee's essay on Katherine Sherwood's work for her *Golgi's Door* exhibition [1], which revealed more a person forming a relationship with a body of work on its own terms. *The Aesthetic Brain*, by contrast, offers a philosophically reasoned argument—lively, but largely detached from both the people who make art and the essential language(s) of art. Nonetheless, I do believe this book could help move our cross-disciplinary conversations in a worthwhile direction because Chatterjee is not intent on building yet another theoretical structure outlining how we need to study art and the brain. Instead, he defers. Rather than jamming art into a model, he allows the book to remain an invitation for us to have a broader discussion. To my mind, this conclusion allowed him to land in something like the right place. He writes:

Art germinates instinctually and matures serendipitously. Its content is a serendipitous mixture born of time and place and culture and personality. Could it be any other way? Being deprived of a grand unifying instinctual theory of art is not a cause for concern. Instead, the diverse, local, and serendipitous nature of art is precisely why art can surprise us, enlighten us, force us to see the world differ-



ently, ground us, shake us, please us, anger us, bewilder us, and make believers of us (p. 185).

On the way to this conclusion, Chatterjee stresses a number of important points. First, he points out on several occasions that there is no evidence from brain studies of a specific neural network dedicated to aesthetics, nor specific networks dedicated to aesthetic sensation, aesthetic emotion or even aesthetic meaning. Rather, he notes, brain responses to art are organized in flexible ensembles. Indeed, part of what makes art and aesthetic experiences rich and unpredictable is the flexibility by which components combine in aesthetic ensembles. Using Art Shimamura's triad of "emotions, meaning and sensations," Chatterjee looks to see if it can form a framework broad enough to accommodate all art: the art we know from Paleolithic times to the eclectic variety surrounding us today. The problems he finds are that different people emphasize the elements of the triad differently and that "contemporary art does pose a special challenge for scientists. Thus the challenge lies in figuring out if science can deal with meaning in art and whether this challenge sets inherent limits on the reach of science" (p. xxi). Chatterjee examines the problems art poses by asking if art is an instinct or a cultural by-product of life. He also grapples with ways the scientific design might address contextual meaning embedded in

artworks as well as recent conceptual and non-aesthetic trends that defy the “simplicity” of simple static paintings and sculptures. As I noted above, he decides we cannot.

Chatterjee, who is a neurologist, does overlook some recent neuroscientific research on art and our sensory experience. Some of this work would have allowed him to demonstrate more concretely that art is ultimately as nuanced and complicated as our neural machinery itself. *Art and the Senses* by Francesca Bacci and David Melcher [2] would have given him a wealth of concrete quantitative and qualitative studies by artists, scientists and humanists. *The Age of Art: The Quest to Understand the Unconscious in Art, Mind and Brain* by Eric Kandel [3], a recipient of the 2000 Nobel Prize in Physiology or Medicine, included a full chapter titled “The Biological Response to Beauty and Ugliness in Art.” Kandel integrates the work of the Viennese artists and scientists at the turn of 20th century with several topics Chatterjee considers (e.g. pleasure and sex, art that isn’t strikingly beautiful, etc.). Moreover, Kandel’s exploration of the expressive art of Klimt, Kokoschka and Schiele, artists who many say challenged the aesthetic focus on beauty, would have offered an excellent and tangible counterpoint in the discussion. Chatterjee, by way of contrast, seemed to lose sight of actual artworks when looking at much of the aesthetic design space. Gerald Edelman’s *Neural Darwinism*, which synchs nicely with Chatterjee’s comments on brain plasticity, also seemed like a good fit for the discussion [4].

Another direction that could have been included is Charles Bell’s work, particularly since Bell had an interest in aesthetics as both an artist and neuroscientist. Bell (1774–1842) was a Scottish anatomist, surgeon, physiologist and artist who worked before the invention of photography. Bell not only studied and taught art [5], he also made major contributions to neuroscience. A larger point here is that Bell’s theories of emotion offer an

evolutionary counterpoint to current views. Although his theories did not stand the test of time empirically, Bell had a tremendous influence on others. For example, Charles Darwin’s *The Expression of Emotions in Animals and Man*, a book Chatterjee references, drew significantly on Bell’s work. Ironically, Chatterjee references Paul Ekman’s work related to this Darwin book, but not Ekman’s collaborative work with Prodger exploring Darwin’s use of art in developing his theories about emotion [6]. We now know that Bell’s theoretical views incorporated many of the racial and theological biases of the 19th century and his errors alert us to the need to think about how we build our prejudices into our theories.

I also think *The Aesthetic Brain* would have been stronger if Chatterjee more effectively communicated points of overlap and dissonance between art and aesthetics. To my mind, images of artwork could have helped him frame his thinking and the scientific literature. Indeed, it is striking that the array of research he offers related to beauty and pleasure includes many anecdotes but strikingly little art, and few visuals. There are only three images in the book. One is a line showing the proportions of the golden section. One is a picture of a golden section. The third is a rather dense image of the pleasure and reward centers of the brain, which seemed quite out of place as a singleton brain image, given how little it offered in the scheme of things. Many art-related examples came to mind as I read, and I think having images in the volume would have had added appeal to readers from the arts.

Reading the section on beauty, I thought about Leonardo da Vinci’s (1452–1519) grotesque drawings of human heads and Charles Bell’s comment on them in *The Anatomy and Philosophy of Expression as Connected with the Fine Arts*:

[Leonardo] searched for ugliness. If he saw an uncommon face,—if it were a caricature of expression,—

he would follow it, and contrive to look at the individual in all aspects. He would pursue a curiosity of this kind for a whole day, until he was able to go home and draw it. We have here the practical result of the theory, which is, to study the deformities, in order to learn to avoid them; and certainly the effect was admirable, since we know, as his biographer has written, that his painting of beauty raised love in all beholders [7].

Édouard Manet (1832–1883) is another artist who could have helped tie threads together and highlight various conundrums. Henri Matisse wrote in 1932, for the centenary of Édouard Manet’s birth, that Manet was “the first painter who immediately translated his sensations, thereby liberating his instinct” [8]. We see this in the exquisitely rendered still life paintings of flowers he did during the last months of his life, as he lay dying. Manet had been ill for several years and unable to paint. Upon receiving bouquets from friends who came to visit, he decided that he wanted to paint them all, and he nearly did. From an aesthetics perspective, it is easy to see beauty in these renditions. Still, although brain studies could help to analyze the beauty people perceive in these paintings, they would add nothing meaningful on their own and would even skew the pathos within this body of work. This kind of example would have concretely reinforced Chatterjee’s point that meaning in art poses a problem to scientific study. (Including the story behind the paintings in an experimental design might show activation of a pathos center, which would indeed be an interesting way to study the brain.)

Artworks might also have helped him with contextual nuances in other ways. Food, for example, was a topic discussed in the pleasure section. Even if we are unaware of the art historical canon’s view that Diego Velázquez (1599–1660) liked to use working-class characters in his work, we can, for example, relish

his talent in visually capturing and conveying the smell of eggs cooking in his wonderful painting, *Old Woman Frying Eggs* (1618). Similarly, why do Wayne Thiebaud's cakes look delicious [9] while Cézanne's apples, although visually tantalizing due to how he handled the paint, appear to carry little "taste" information to the brain? Chatterjee's discussion of money also brought many works to mind. I immediately thought of the contrast between Quentin Matsys's (Dutch, 1465/1466–1530) painting *The Moneylender and His Wife* (1514), which condemns avarice and exalts honesty, and *200 One Dollar Bills* by Andy Warhol, a 1962 work that was sold by Sotheby's for \$43,762,500 in 2009 [10]. But, of course, my larger point is that I like looking at art and I also think a large array of artworks would have helped communicate the core ideas of the book and how/why art challenges a grand theory of neuroaesthetics.

*The Aesthetic Brain*, although quite comprehensive in some ways, also brings to mind that one book cannot cover everything. Many kinds of art, particularly those the standard art canon has difficulty coming to terms with, were very much in the background even within the book's broad definitional space. Perhaps this is because aesthetics theories tend to deal more with objects than *praxis*? In this case, Chatterjee did not consider how "embodiment" approaches are challenging the "spectacle" or social, textual preferences advocated in the elitist circles of critics like Blake Gopnik, a commentator Chatterjee mentions frequently. Collaborative efforts to research the senses today likewise seem to fall outside of Chatterjee's scope. Marcus Novak's multimodal data exploration conceived with the Allosphere, *Allobrain* [11], comes to mind in both instances. This work presents a virtual world consisting of isosurfaces of brain blood density drawn from fMRI imaging data in an attempt to provide the experience of being inside a brain as architectural space. Another example is media artist Jill Scott's neurome-

dia sculpture "The Electric Retina," created during her residency at the Neuroscience Lab University in Zurich, Switzerland [12].

Prototyping and model-making are similarly absent, and I believe *Leonardo* readers would think these topics belong in a discussion of "the properties of objects and our emotional responses to those properties" (p. 115), particularly since much of this work has a sensory component (and a long historical trajectory). Leonardo da Vinci's unpublished studies of the brain, which were more advanced than what science was doing at the time, were perhaps a precursor of this kind of work today. His 16th-century studies, based on wax castings of cattle ventricles, produced a picture of the brain far beyond what science had "seen" at that point because scientific dissections of his era were hampered by the inability to preserve the form of the brain when studying it. Scientists of that time rapidly sliced through important information hoping to learn as much as possible before the tissue deteriorated. Leonardo, by contrast, used his artistic training to make a model of the organ so as to study its properties.

In summary, the analyses of beauty, pleasure and art in *The Aesthetic Brain* are spelled out through various psychological and neuroscientific experiments, as well as evolutionary and anthropological theories that directly or indirectly measure aspects of beauty, pleasure and art. Overall, the discussion parallels art rather than addressing it directly. Chatterjee's style will appeal to academics and generalists who are interested in aesthetic theory. Those interested in art may enjoy its range. He concludes by noting that there is no neural network dedicated to aesthetics and by asking whether we have an instinct for art or whether art is a cultural by-product of life. The challenging issue he grapples with in building his scientific design is how we embed the contextual meaning of artworks as well as recent conceptual and non-aesthetic trends that defy the "simplicity" of simple static paintings and sculptures.

This is a challenging issue (and I think an unsolvable one). At the end, Chatterjee refreshingly concludes that a grand theory for neuroaesthetics cannot encompass many aspects of art. I liked the book largely because I share this view.

## References and Notes

- 1 Chatterjee, Anjan, "Apoplexy and Personhood in Katherine Sherwood's Paintings," in *Golgi's Door*, J.D. Talesek (ed.) (Washington D.C.: National Academy of Sciences, 2007) pp. 44–52.
- 2 Bacci, Francesca, and Melcher, David, *Art and the Senses* (Oxford, U.K.; New York, NY: Oxford University Press, 2011). Also, see my review of *Art and the Senses* in *Leonardo*, Vol. 47, No. 5 (2014) pp. 515–516. The review is also available on Leonardo Reviews Online: <<http://leonardo.info/reviews/mar2014/bacci-ione.php>>.
- 3 Kandel, Eric R., *The Age of Insight: The Quest to Understand the Unconscious in Art, Mind, and Brain: From Vienna 1900 to the Present* (New York, NY: Random House, 2012).
- 4 Edelman, Gerald M., *Neural Darwinism: The Theory of Neuronal Group Delection* (New York, NY: Basic Books, 1987).
- 5 Wellcome Images offer a number of examples of Bell's artwork; see <<http://wellcomeimages.org/indexplus/image/L0019305.html>>.
- 6 Philip Prodger offers a good overview of this collaborative effort, including Darwin's studies of Bell's work, in his 2009 publication *Darwin's Camera: Art and Photography in the Theory of Evolution* (Oxford, U.K.; New York, NY: Oxford University Press, 2009). Also, see my review of *Darwin's Camera* in *Leonardo*, Vol. 44, No. 1 (2011) pp. 78–80. The review is also available on Leonardo Reviews Online: <[www.leonardo.info/reviews/apr2010/ione\\_prodger.php](http://www.leonardo.info/reviews/apr2010/ione_prodger.php)>.
- 7 Bell, Charles, *The Anatomy and Philosophy of Expression as Connected with the Fine Arts*, 4th ed. (London, U.K.: J. Murray, 1847) pp. 19–20.
- 8 Fried, Michael, *Manet's Modernism: Or, The Face of Painting in the 1860s* (Chicago, IL: University of Chicago Press, 1996) p. 6.
- 9 For Thiebaud images, see: <[www.nga.gov/content/ngaweb/Collection/art-object-page.72040.html](http://www.nga.gov/content/ngaweb/Collection/art-object-page.72040.html)> and <<http://whitney.org/Collection/WayneThiebaud>>. Cézanne's *Still Life with Apples and a Glass of Wine* is available at: <[www.philamuseum.org/collections/permanent/51227.html?mulR=1912982316](http://www.philamuseum.org/collections/permanent/51227.html?mulR=1912982316)>.
- 10 See: <[www.louvre.fr/en/oeuvre-notices/moneylender-and-his-wife](http://www.louvre.fr/en/oeuvre-notices/moneylender-and-his-wife)> for more information about *The Moneylender and His Wife* and <[www.sothebys.com/en/news-video/blogs/all-blogs/21-days-of-andy-warhol/2013/11/andy-warhol-200-one-dollar-bills.html](http://www.sothebys.com/en/news-video/blogs/all-blogs/21-days-of-andy-warhol/2013/11/andy-warhol-200-one-dollar-bills.html)> for more about the sale of Warhol's *200 One Dollar Bills*.
- 11 More information about *Allobrain* is available at <[www.allosphere.ucsb.edu/media.php](http://www.allosphere.ucsb.edu/media.php)>.
- 12 For Jill Scott's project, see <<http://vimeo.com/1387705>>.