The Aesthetic Brain: How We Evolved to Desire Beauty and Enjoy Art

by Anjan Chatterjee, MD. Oxford University Press, New York, NY, 2014, 217 pages, $34.95 (hardcover).

In this book, Dr Anjan Chatterjee, a clinical and research neurologist at the University of Pennsylvania, introduces us to the emerging field of neuroaesthetics and what it has to offer. He surveys fields of art appreciation, neurosciences, PET and fMRI scans and clinical trials, anthropology, evolutionary biology, and philosophical constructs. His personal search is for understanding, and in the book he shares his informed quest: "Why is something regarded as beautiful?" and "For what purpose?" Chapters range from considerations of beauty, pleasure, and art through all these disciplines.

He succinctly outlines the areas of the brain that are active in appreciating facial and body attractiveness and the implications for the evolution of our species. He makes the case for those aspects of liking and wanting that relate to art and beauty. In his cogent review of the long history of human artifact-making art, he carefully considers the many definitions of aesthetics, art, and beauty. He examines all the major definitions of these and considers how many of them are found wanting in the wide world of art as it is currently comprised.

Beauty is not a unitary concept. Dr Chatterjee outlines a continuum from hot, as in sexual passion for an object, to cool, as in Euler's elegant mathematical proof, and describes which parts of the brain are activated by images from this continuum presented to human subjects.

While the various attractions can be localized in the brain by electrode implants and more recently by PET and fMRI studies, there is no one specific area for aesthetic pleasures, which are complex admixtures of emotions colored by our histories.

Focusing on visual art, for instance, with experimental neuroaesthetics, psychologists moved from perception to attention and emotion. It was revealed that we respond to hidden mathematical regularities in artworks. Fourier spectra measure the range of spatial frequencies from broad swathes to finer details, and investigators have found that those most characteristic of natural scenes are similarly found in art from 15th century engravings through landscape paintings to 20th century abstract art, but not in photographs of laboratory or household objects, plants, or scientific illustrations. These findings can be characterized as "outer psychophysics," which Dr Chatterjee says "can also be thought of as the study of aesthetic properties of objects…but evoke an aesthetic experience within us" (p 137). He reviews studies in which subjects looked at various images and rated them from ugly to beautiful; MRI and magnetoencephalography were then used to show which brain areas were activated and to what intensity by which images were judged more beautiful. The areas involved were sensory association areas. Pleasure areas for good food, sex, and money were engaged also by expressed pleasure in beautifully judged art. Giving meaning or context allowed subjects to judge their liking of art more quickly, although, given more ambiguous explanations, subjects found modern abstract art more likeable. Thus, has he described recent work on "inner neuroaesthetics."

The author comes to his persuasive conclusion after having carefully examined prehistoric art objects, the history of art, evolutionary biology, brain anatomy, and functional studies. He notes that art blossoms, like biologic variation, during times of relaxed selective pressures—that is, during times of more freedom from societal constraints. Conversely, that art becomes quite restricted in style and content during times of severe environmental restriction or strong selective pressures, as under oppressive regimes in which deviant artists are strongly sanctioned, even until death. After regime overthrow, revolutionary art can emerge, whether it be in Germany, with the demise of Nazism, or in the form of the murals created during the heady days of the early Arab Spring. Finally, to sum up, "art changes depending on its environmental niche.…It can be released from the burden of serving a purpose, mutate unpredictably…the expression of an instinct and a relaxation from this instinct.…Art, it turns out, signals our freedom" (p 179). Chatterjee ends by saying that when we relax into art, content shaped by the local conditions of our cultures and our own experiences, we are better off for it.

For further reading, I strongly recommend the latest book by neuropsychiatrist and Nobel Prize winner Eric Kandel, *The Age of Insight: The Quest to Understand the Unconscious in Art, Mind, and Brain, from Vienna 1900 to the Present*. He, too, references unconscious attractive qualities in people that are indicative of health, good genes, and their neuroanatomic underpinnings, with many examples by Freud, Klimt, Schiele, Schnitzler, and others. On page 441, he quotes Semir Zeki, the pioneer of neuroaesthetics: "The main function of the brain is to acquire new knowledge and that visual art is an extension of that function…art extends the functions of the brain more directly than other processes of acquiring knowledge" and "Since vision is above all an active process, art also encourages an active and creative exploration of the world."

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