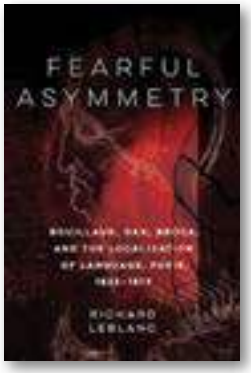
Book Review

Jack Coulehan, MD, MPH, Book Review Editor



Fearful Asymmetry: Bouillaud, Dax, Broca, and the Localization of Language, Paris, 1825–1879

Richard Leblanc
McGill-Queen's University Press, 2017, 280 pages

Reviewed by Richard Ratzan, MD

> The brain is a double organ; and, whilst this doubleness is in harmonious accordance with the doubleness of all the organs of sense—nay, more, indeed, is just what a priori reasoning would lead us to expect as necessary to the functions of the special senses as double inlets to knowledge—it necessarily follows that the functions of the two cerebral hemispheres must be identical; and, therefore, that, if there be a special organ for the faculty of speech in one hemisphere, there must also be the same in the other.
>
> —Robert Dunn[1]

When Da Vinci created his "Vitruvian man" circa 1490, he was guided by the concept of symmetria, which is a translation of the Greek word *ἀναλογία*. The idea was central to Plato's account of mathematics and Aristotle's discussion of justice, but Da Vinci adopted the vitruvian use of symmetria, which is usually translated as proportion.

Contemporary viewers of "*The Vitruvian Man*" can perceive the proportions in Da Vinci's image, but we can also see a symmetry he likely did not. At the very least, there is a language for it that was unavailable to him, because of the modern notion of symmetry as the bilateral relationship of mirrored images dates to the late 18th century, taking shape only after Legendre's 1783 mathematical proof of the symmetry in solids.[2]

The evolution of this mirror-image duality, which implies functional equality between the two sides, led to the dominance of the motif in many non-mathematical fields such as botany, crystallography, and anatomy.

Richard Leblanc, in his book *Fearful Asymmetry,* draws on the history of this evolution to illuminate the assumption physicians and anatomists made when they assumed that each of the brain's two hemispheres performed exactly the same function. Why should the right and left cerebral hemisphere be different in their doubleness, rather than sharing the mirrored proportions of the eyes, the kidneys, and the lungs?

For 60 years, French anatomists studied the brain but, as there are none so blind as those who will not see, they could not see the evidence for asymmetry. Despite overwhelming anatomical and clinical findings that contradicted the received doctrine of cerebral symmetry as pronounced by respected authorities, 19th century French students of aphasia could not bring themselves to see what was right in front of their eyes.

This evidentiary blindness had to be overcome before anatomists and neuroscientists could demonstrate the lateralization of the anatomic basis for articulate speech. But how was this possible in the first place? To better understand this phenomenon, Leblanc traces the history of the dogma.

It began with Xavier Bichat (1771–1802) and continued with Jean-Baptiste Bouillaud (1796–1881), both of whom were respected members of the French medical firmament. These two scientists were influenced by the phrenologist Franz-Joseph Gall (1758–1828), whose notion of localization was quasi-correct, but for all the wrong reasons. There is a strong sense in Leblanc's narrative that a good old boy mentality dominated intellectual discourse at the time, as it did elsewhere in the early to mid-19th century. This mentality was eventually open to empirical correction, as Leblanc demonstrates in an almost hour-by-hour account of this fascinating story.

The story of how this blindness was overcome begins with Marc Dax (1770–1837) who, in 1836, was the first to posit a left sided locus for articulate speech. He was a provincial, but highly observant, surgeon who, recorded his observation that the center for articulate speech was located in the left cerebral hemisphere. He never published his observations, but his son, Gustave (1815–1893), noted similar findings in 1865 and published them along with his father's earlier experience. There was an intriguing relationship between Dax's conclusions and those of Paul Broca (1824–1880), and to this day there is controversy about the historical attribution of credit for discovering the anatomical locus of articulate speech.

But, as many have noted, the winners get to write the history of an event, and the winner in this battle was Paul Broca: the anatomical site for expressive aphasia, known as Broca's area.

From the work of Marc and Gustave Dax, the tale proceeds in fits and starts, with a great deal of grandstanding. The medical establishment confronted extensive evidence for lateralization in the examination of military and suicidal head wounds and autopsies of well-studied aphasic patients, but it repeatedly reverted to the dogma of symmetry, preferring the comfort of authoritative pronouncements to clinical and pathological findings. Despite this, the cure for evidentiary blindness was complete when the idea symmetry-defying sinistrality was accepted in 1865.

In a fair and scholarly fashion, Leblanc documents the forward and backward steps scientists and physicians took in this slow-motion march from the observed but denied, to the observed and accepted. Along the way, the copious endnotes citing historical documents—most of which are in French—are astonishing. His sources range from periodical publications to letters to the minutes of academic meetings. Though not his primary aim, Leblanc lays the groundwork for important reflections that might impact research, and assessment of its veracity. The conclusions drawn from research must include an acknowledgment of the inherent limitations of instruments and methods, as well as an openness to correction when following the ostensibly established assumptions of authoritative researchers rather than questioning these assumptions—an issue that has recently been highlighted in the Alzheimer's research community.

Throughout this book, I was reminded repeatedly of a lesson Stephen Jay Gould emphasized in almost every essay in his column in *Natural History* magazine: a study of the wrong turns by the right people is as important as the right turns by the right people.[3] We can learn from both camps how to remain humble as we continue to question assumptions and pursue the wonders of nature.

References:

1. Dunn R. On loss of speech, or the power of utterance, in respect to its cerebral bearings and causes. Br Med J. 1869 Jan 30; 1(422): 99-101.
2. Hon G, Goldstein BR. From Summetria to Symmetry: The Making of a Revolutionary Scientific Concept. New York: Springer, 2008.
3. Gould SJ. The Panda's Thumb: More Reflections in Natural History. New York: W.W. Norton. 1980; 76–84.

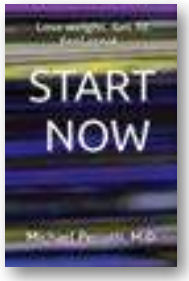
Dr. Ratzan, is an Internist in Hartford, CT, practicing at Hartford Hospital. His e-mail address is qpwertyu12@gmail.com.

Do you want to review a book?

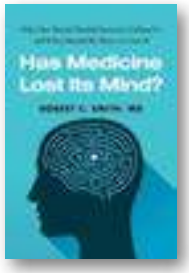
The Pharos publishes reviews of books related to the broad fields of medical humanities, including but not limited to history, philosophy, ethics, literature, sociology, economics, law, and anthropology as they relate to medicine and the experience of illness and healing. This journal does not publish reviews of personal memoirs or books devoted to clinical treatment or developments in any specialty of medicine.

If any reader has identified a book they would like to review, please contact *The Pharos* at pharos@alphaomegaalpha.org, and indicate your interest before beginning to write. *The Pharos* can only publish a limited number of reviews each year. Inquiries are welcome, please do not but request that you not submit a review without prior approval.

More books by AΩA authors



Start Now: A guide to your best health
Michael Perrotti, MD (AΩA, Albany Medical College, 1989); Independently published, March 18, 2025, 213 pages.

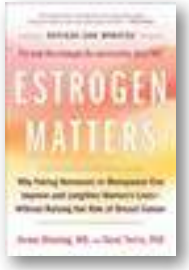


Has Medicine Lost It's Mind?: Why Our Mental Health System Is Failing Us and What Should Be Done to Cure It
Robert C. Smith (AΩA, University of Iowa Roy J. and Lucille A. Carver College of Medicine, 1962); Prometheus; March 4, 2025, 200 pages.

Hope for Awareness
George Spaeth, MD (AΩA, Harvard Medical School, 1959); Moonstone Arts Center, 2025.

Underestimated: My Unlikely Journey to Becoming a Surgeon
David Kabithe, MD, FACS (AΩA, University of Louisville School of Medicine, 1997); November 29, 2024;184 pages.

Surgeons and Something More: The History of Surgery at the University of Pennsylvania
Clyde F. Barker, MD (AΩA, Perelman School of Medicine at the University of Pennsylvania, 1994, Faculty), and Elizabeth Barker; the American Philosophical Society Press November 12, 2024, 592 pages.



Estrogen Matters: Why Taking Hormones in Menopause Can Improve and Lengthen Women's Lives—Without Raising the Risk of Breast Cancer (2024 Revised and Updated Edition)
Avrum Bluming, MD, MACP (AΩA, Columbia University Vagelos College of Physicians and Surgeons, 1964), and Carol Tavris. Little, Brown Spark; September 3, 2024; 352 pages.

Beyond the False Summit
Thomas L. Schwenk, MD (AΩA, University of Nevada, Reno School of Medicine, 2017, Faculty); Surrogate Press; May 3, 2024; 400 pages.