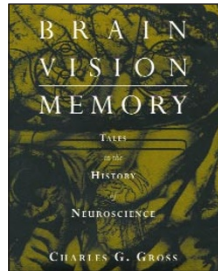


# A vision of history



## *Brain, Vision and Memory: Tales of the History of Neuroscience*

by Charles G. Gross

A Bradford Book, MIT Press, 1998. \$32.50 softcover, pp 247

ISBN 0-262-07186-X

Reviewed by Dale Purves

In an era when the retrospective horizon of scientists tends to be measured in years if not months, it is heartening to read these collected essays by Charles Gross, who skips across the centuries—indeed, millennia—with authority, intelligence and wit. Gross, a highly accomplished neuroscientist in his own right, has a long-standing affection for historical figures and issues, often quite quirky ones. Gross tells us that when his thesis advisor asked him to write the usual historical preface to his dissertation, the distraught mentor found his pupil some six months later still laboring enthusiastically on Galen's studies of frontal-lobe damage in piglets, having reached only the second century A.D.

What Gross offers in these five previously published articles is a sample of his interests in a variety of historical issues related, for the most part, by the theme of brain structures underlying vision. Like many impassioned historians, Gross is at his best when he tells us about events that transpired on the margins of the mainstream. Thus, one of his most entertaining essays is an account of the neuroscientific thinking of Emmanuel Swedenborg, the Swedish nobleman, philosopher and mystic who correctly identified the cerebral cortex as the organizer of sensory-motor function at a time—the middle of the 18th century—when this structure was taken to be a largely useless 'rind' (primarily because vivisected animals were oblivious to cortical extirpation, in contrast to their vigorous reaction to the manipulation of other organs). Before turning to the religious mysticism that con-

sumed the last 30 years of his life (the fruits of which persist today in the Swedenborgian Church), Swedenborg anticipated an understanding of cortical function that was not generally espoused for another two hundred years. The underlying question that interests Gross in this account is whether a pure theoretician can ever contribute significantly to biology. Because Swedenborg's prescient ideas had no impact whatsoever, Gross answers the question in the negative.

Equally intriguing is Gross's story of the hippocampus minor, a fascinating tale of the paleontologist Richard Owen's highly prejudiced attempt to show that a trivial feature on the floor of the lateral ventricle provided proof-positive that the human brain could not have evolved from that of a great ape. Like Stephen Jay Gould's *The Mismeasure of Man*, the essay provides dramatic evidence of how respected and powerful scientists have used brain structure—real or imagined—to promote their social and political agendas. Happily, Owen met his nemesis in T.H. Huxley, who was eventually able to demote the hippocampus minor to its proper inconsequential status. Some readers may be disappointed that, in his penchant for history, Gross generally eschews recent events, which in this case might have brought us up to date on the ongoing use of brain and cranial anatomy to promote social biases.

In another essay, Gross takes up Leonardo da Vinci's extraordinary contributions to neuroscience, focusing primarily on his depiction of the ventricles (based on injections of wax), his description of the optic nerve and his

thoughts about optics. No less interesting in the account, if considerably less accurate, is Leonardo's concept of the neuroanatomy underlying sexual intercourse. To accommodate Avicenna's dogma that semen was generated in the brain and traveled down the spinal cord, Leonardo's otherwise splendid drawings (which Gross reproduces) contain the depiction of a hollow nerve well suited to this purpose running from the spinal cord to the penis.

The most modern treatment in the essays describes work largely from this century on the functions of the extrastriate cortical areas that have some effect on vision. Although highly informative, Gross' freewheeling style seems inhibited here, perhaps because the article includes an account of some of his own work, as well as that of his contemporaries. (History is always easier to write frankly when the author is not an actor, or when the principals are dead.)

**Gross provides a highly colorful tapestry that touches on many historical facets of visual neuroscience, which he has obviously enjoyed weaving.**

The high point of the article is a wonderful account of the Klüver-Bucy syndrome (the fearless, hypersexual state induced in macaques by bilateral destruction of the temporal lobes) and the events that led to its discovery (largely dependent on Klüver's personal interest in the effects of mescaline).

The longest essay (some 90 pages) tracks the diverse ideas about the visual cortex, from the first mention of the cerebral cortex in the Edward Smith papyrus (1700 B.C.) to the present. Although chocked full of interesting facts, too little space is devoted to each historical contributor (usually a paragraph or two) to entirely save this article from the kaleidoscopic quality of a more conventional review.

Such minor flaws aside, Gross provides a highly colorful tapestry that touches on many historical facets of visual neuroscience, which he has obviously enjoyed weaving. Thank goodness his thesis advisor didn't rap his knuckles too sharply over Galen's piglets.

Dale Purves is at the Department of Neurobiology, Duke University Medical Center, Durham, North Carolina 27710, USA  
email: [purves@neuro.duke.edu](mailto:purves@neuro.duke.edu)