

Rachel
Carson
Center
Perspectives

How to cite:

Smith, Chris. "Neuroscience and History." In: "Environment, Culture, and the Brain: New Explorations in Neurohistory," edited by Edmund Russell, *RCC Perspectives* 2012, no. 6, 65–68.

All issues of *RCC Perspectives* are available online. To view past issues, and to learn more about the Rachel Carson Center for Environment and Society, please visit www.rachelcarsoncenter.de.

Rachel Carson Center for Environment and Society
Leopoldstrasse 11a, 80802 Munich, GERMANY

ISSN 2190-8087

© Copyright is held by the contributing authors.

SPONSORED BY THE



Federal Ministry
of Education
and Research

Deutsches Museum 



C. U. M. (Chris) Smith

Neuroscience and History

Can neuroscience illuminate history? Does neurohistory constitute a useful research program? These are fundamental questions which must inform any investigation of the topic.

To begin with, there is a pressing need for historians and neuroscientists to understand each other's language and each other's basic conceptual systems.

The neuroscientist operates on both a micro- and a macroscale; the historian principally on a mesoscale. How does the brain “work”? The neuroscientist thinks of action potentials, synapses, and ion fluxes through intricately designed molecular gates. The historian thinks of outcomes: of how the whole brain influences the behavior of significant historical figures and events. How does the brain change? The neuroscientist thinks on both the meso- and macroscale: on both the developmental (or ontogenetic) scale and the evolutionary (or phylogenetic) scale. The historian is interested in changes occurring at the generational or, at most, the millennial scale. Conceivably, new neuroimaging techniques will help fill this mismatch, but then another problem emerges: the ancient mind-body problem. How do the changes in brain activation detected by neuroimaging translate into changes in subjectivity?¹

Yet the enterprise is far from hopeless—just delicate and nuanced. There are numerous points of possible mutual interest, numerous historical topics where knowledge of neuroscience can make a contribution: from mob behavior to visual perception. The most obvious is, perhaps, the neuroscientist's understanding of the symptoms of the neurological diseases that sometimes affect the stressed lives of the often elderly individuals who hold positions of power: kings, emperors, generals, presidents and prime ministers.² Neuroscientific insight may help account for some of their decisions.

1 Van Orden and Paap (1997) discuss the size of the gap between neuroimages and subjectivity, as does Noë (2009, chap. 1).

2 See the publications of the former British Foreign Secretary and one-time neurologist David Owen (2006, 2007, 2008). Other publications in this area include articles by Ranum, Krueger, and Schut on Abraham Lincoln (2010), and by Peters and Beveridge on King George III (2010).

In the same context, it is worth observing that personality is strongly inherited (Penke Japp, and Miller 2007). It may be that all personality types exist in a population and certain types are more strongly selected by some cultures and social strata than others. One thinks of the Castellan chaos in the early Middle Ages, where social conditions may well have favored extremely aggressive, even paranoid personalities (Smail 2008, 168–9); conversely, the mass cultures of the early riverine civilizations of the Middle East may have favored docility in the laboring masses. Surely animals are not the only organisms to have their temperaments profoundly changed by domestication. Human societies, like those of many (but not all) primates, also show repeated movement toward dominance hierarchies—one thinks of the god-like status accorded Roman, Aztec, and Inca emperors, or of the almost superhuman status of the Roman Catholic Pope, as seen by Montaigne in the late sixteenth century (Bakewell 2010, 240).

Again, is it the case that those who hear voices summoning them to leadership (one thinks, for instance, of Joan of Arc) or are otherwise convinced that they are “men of destiny” (Charles de Gaulle in 1940) are somewhere on a spectrum whose extreme end is schizophrenia? Is the need for leaders a reason that the genes which predispose for this disabling condition are selected for and remain in the human population (Crespi, Summers, and Dorus 2007)—just as the gene which causes disabling sickle cell anemia is maintained in the population because, in the heterozygous condition, it protects against malaria?

Here, also, one might take note of the work of ethologists on supernormal releasing stimuli (Tinbergen 1951). The best-known examples are the exaggerated (delighted) responses of herring gulls to supersized eggs and the evolution of the absurdly non-adaptive peacock’s tail. Do we not see the repetitive development of similar absurdities in the costumes of princes and emperors: the emperor of the Aztecs; of China; the royalty of England?

Another instance where neuroscience illuminates history is provided by the brain’s demand for “meaning.” Half a billion years of predator-prey “arms races” have ensured that sensory systems are designed to detect pattern and breaks in pattern (Smith 2009). The latter warn prey animals that a camouflaged predator is moving in for the kill and similarly allow the predator to detect prey camouflaged in the background. We, too, have our patterns of expectation. When these are broken, we are puzzled, anxious, and

defensive. The brain has also been evolved to detect “agency” and often detects “intentionality” in the world, even the inorganic world, where none exists (Shermer 2011). Is it too much to suggest that religious wars have been fought on these issues?

Finally, in this all-too-short essay, it is clear that recent studies of social neurobiology, especially of the mirror-neuron system, throw considerable light on the origins of mythopoeic thought in early societies (Frankfort et al. 1949). It is also clear that evolutionary neuroscience throws interesting light on the origins of universal human traits such as the aesthetic sense (Smith 2006) or cheater-detection in social exchange (Cosmides 1989), among others. These inbuilt characteristics often play significant roles in history. Lastly, turning to large-scale “universal” or “world” history, it may be that models from recent studies of animal phylogeny will prove valuable. Morris (1998), for instance, argues that from a vast assemblage of animal forms in the pre-Cambrian era only a few major designs have ultimately proved successful: arthropods, mollusks, and chordates; and, as we enter the Anthropocene, only the chordates have won out. Perhaps we should rework the largely discredited ideas of Spengler and Toynbee. Perhaps something similar to the evolutionary success of the chordates has happened in world history, ending with just two great solutions, the social systems represented by China and the West, respectively, or even, as Fukuyama (1992) once argued, just one: the West’s free-market capitalism.

References

- Bakewell, Sarah. 2010. *How to Live, A Life of Montaigne*. London: Chatto and Windus.
- Cosmides, Leda. 1989. “The Logic of Social Exchange: Has Natural Selection Shaped How Humans Reason? Studies with the Wason Selection Task.” *Cognition* 31: 187–276.
- Crespi, Bernard, Kyle Summers, and Steve Dorus. 2007. “Adaptive Evolution of Genes Underlying Schizophrenia.” *Proceedings of the Royal Society B: Biological Sciences* 274: 2791–99.
- Frankfort, Henry, Mrs. H. A. Frankfort, John A. Wilson, and Thorkild Jacobsen. 1949. *Before Philosophy*. Harmondsworth: Penguin Books.
- Fukuyama, Francis. 1992. *The End of History and the Last Man*. New York: Free Press.

- Morris, Simon Conway. 1998. *The Crucible of Creation: The Burgess Shale and the Rise of Animals*. Oxford: Oxford University Press.
- Noë, Alva 2009. *Out of Our Heads*. New York: Hill and Wang.
- Owen, David. 2006. "Hubris and Nemesis in Heads of Government." *Journal of the Royal Society of Medicine* 99: 548–53.
- . 2007. *The Hubris Symptom*. London: Politico.
- . 2008. *In Sickness and in Power*. London: Methuen.
- Penke Lars, Jaap J. A. Dennison, and Geoffrey F. Miller. 2007. "The Evolutionary Genetics of Personality." *European Journal of Personality* 21: 549–87.
- Peters, Timothy J., and Allan Beveridge. 2010. "The Blindness, Deafness and Madness of King George III: Psychiatric Interactions." *Journal of the Royal College of Physicians of Edinburgh* 40: 81–85.
- Ranum, Laura P. W., Katherine A. D. Krueger, and Lawrence J. Schut. 2010. "Abraham Lincoln May Have Had SCA Type 5." *Neurology* 74: 1836–37.
- Shermer, Michael. 2011. *The Believing Brain*. New York: Times Books.
- Smail, Daniel Lord. 2008. *On Deep History and the Brain*. Berkeley: University of California Press.
- Smith, C. U. M. 2006. "Evolutionary Biology and Art." *International Review of Neurobiology* 74: 1–14.
- . 2009. *Biology of Sensory Systems*, 2nd ed. Chichester: Wiley-Blackwell.
- Tinbergen, Nikolaas. 1951. *The Study of Instinct*. Oxford: Clarendon Press.
- Van Orden, Guy C., and Kenneth R. Paap. 1997. "Functional Images Fail to Discover Pieces of the Mind in the Parts of the Brain." *Philosophy of Science* 64: 85–94.