

# Who will guard the guardians of neuroscience?

Firing the neuroethical imagination

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Brain science is big. With the help of politicians, neuroscientists and the media, the brain has captured the public imagination. In late 2006 and early 2007, readers of *The New York Times* learned the difference between a “tightwad’s brain” and a “spendthrift’s brain” or how our “neurological circuits stop [us] from buying a George Foreman grill but not a Discovery Channel colour-changing mood clock” (Tierney, 2007); the link between addictive behaviour and a part of the brain known as the insula (Carey, 2007); and how “mirror neurons”—a sort of “neural WiFi” that alters our physiology by tracking the emotional flow, movement and intentions of the people around us—can promote healing (Goleman, 2006).

The brain is now seen as the seat of our being, the centre of the self, our secular soul, the source of our conscience and our consciousness. Bioethicists have monitored this interest in the brain and are now parsing important ethical questions brought about by neuroscience. What are the implications of neuroscience for notions of the self, agency and responsibility? How will/should neuroscience influence social policy? How will/should neuroscience be used in clinical settings? How will/should the findings of neuroscience be communicated to the public? (Illes & Bird, 2006; Marcus, 2002).

Ethical concerns with aspects of neuroscience together with cultural ideas about the special importance of the brain—Roskies (2002) calls it “neuroessentialism”—have given us a new subspecialty in bioethics: neuroethics. Now complete with

its own professional association and journal, it joins two other fledgling specialty fields in bioethics: genetics and nanoethics. This partitioning into smaller, more focused specialties, although sociologically predictable, is not pleasing to all bioethicists. Several believe that bioethics—itsself a relatively new profession—is not yet ready for a subdivision: “What remains to be demonstrated is the validity of [the] claim that advances in neuroscience require a wider perspective” (Knoppers, 2005) and “...it is not clear that the conceptual tools used to study ‘neuroethics’ are really different than those generally used for the study of ethics” (Wilfond & Ravitsky, 2005).

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Speaking “against hyphenated ethics”, Parens & Johnston (2006) point out that “proceeding as if [neuro-ethics, gen-ethics, and nano-ethics] were discrete arenas of ethical inquiry risks wasting time” and also risks incoherence. Their concern with the balkanization of bioethics is interesting to sociologists—it is revealing that a profession that was recently known as ‘bioethics’ now wishes to limit the hyphenation of its work—but it does not get to the heart of the matter of neuroethics: what fires the neuroethical imagination?

My analysis of the work of neuroethicists is part of a long tradition that asks *quis custodiet ipsos custodiet*—who will guard the guardians? Who will watch the watchers? This tradition extends from Plato, to first-century Roman poet Juvenal, to that modern fictional ‘everyman’ Homer Simpson. When Homer was caught up in a vigilante movement, he was challenged by his precocious daughter, Lisa: “Dad, don’t you see you’re abusing your power like all vigilantes? I mean, if you’re the police, who will police the police?” His answer: “I dunno. Coast Guard?”

A more recent and less whimsical example of this problem comes from the USA, where political analysts suggest that the recent fall from grace of the Republican Party resulted from the failure of the systems of checks and balances. The authors of the US Constitution created three branches of government—executive, legislative and judicial—with the express purpose of each checking the others. Between 2001 and 2006, the Republican Party controlled all three branches; with no one ‘watching the watchers’, the government suffered through an ill-conceived and mismanaged war, an incompetent response to the devastation of Hurricane Katrina, and several political and sexual scandals.

Although all agree on the importance of watching the watchers, the phrase itself indicates the difficulty of the task: watching the watchers creates the problem of infinite regression. We sociologists of bioethics—whose work it is to describe the emergence, organization and influence, or lack thereof, of a profession whose work it is to watch and to assess the work of doctors and life



scientists—find ourselves in an awkward position. If we are watching bioethicists who are watching doctors, who is watching us?

Good question. The goal of a sociology of bioethics—or, in this case, neuroethics—is to understand better the organization of moral life (De Vries *et al*, 2007). It is not the goal to hoist bioethicists by their own petard, to write an exposé or to otherwise undermine their work. We believe that our research will be useful to those we study, not because that is our intent, but because it will reveal previously unrecognized features and consequences of the social arena in which bioethics operates. The small but growing body of research on the ‘regulatory creep’ of research ethics committees shows how ethics reviews of research involving humans, which were begun with noble intent, have expanded in predictable ways that have clouded their original mission.

If we are to understand what fires the neuroethical imagination—how the field is organized and the content of its work—we must listen to the stories that neuroethics tells about itself. In particular, it is important to hear neuroethicists describe how their branch of bioethics came to be.

To the layperson there is only one story of the origins of bioethics and its daughters neuroethics, genethics and nanoethics: the technology story. In this account, bioethics emerged in response to new technologies that brought with them unprecedented and complicated ethical questions that were too vexing for the average health practitioner or life scientist to answer without

expert guidance. In some cases, this story is elaborated by adding accounts of over-enthusiastic and/or irresponsible scientists who subjected unknowing patients and ‘volunteers’ to dangerous therapies and experiments. The main idea of this standard version of the rise of bioethics is that science and technology were growing rapidly, and could no longer be controlled by practitioners and researchers.

Most histories of neuroethics are varieties of the technology story. Illes & Bird (2006) place the history of neuroethics squarely in the standard account of bioethics that runs from the Nuremberg Code in 1947, to the 1964 Declaration of Helsinki, to the Tuskegee Syphilis Study in the mid-twentieth century, to the Belmont Report in 1979 (Farah, 2005; Bosch, 2006).

It is perhaps too much to expect that neuroethicists are also social historians. However, other accounts of the rise of bioethics do exist. These alternative histories not only provide a richer understanding of the origins of the ethics disciplines, but also point to different directions for the work of these new professionals. For example, Stevens (2000) tells a different, slightly more cynical, story about the technology–bioethics connection, asserting that bioethics is nothing more than the current incarnation of a long-standing American “ambivalence about technology”.

Stevens concludes that bioethics established its institutional home by helping to calm public fears about the relatively recent ability of doctors to sustain the “living dead” and by providing the ethical

scaffolding that allowed doctors and researchers to escape the difficult moral problems associated with organ transplantation and the end of life. Unlike the conventional technology story, in which bioethicists are cast as the guardians who oversee and regulate doctors and scientists, Stevens describes bioethicists as less-than-critical allies of medicine and medical science. She concludes her history with a question: “Bioethics may ultimately be successful in helping to alleviate national anxieties about the right to die or in midwifing developments as disturbing as the cloning of a human being. But will it be able to free itself from the sources that help generate the dilemmas it seeks to resolve?”

Others have pointed out that the appearance of new technologies cannot, by itself, explain the birth of bioethics. Emanuel (1991) reminds us that questions generated by new technology are not new, rather they “are as old as man and medicine”. Medicine has introduced new machines and techniques regularly during the past century, many of which have reframed or created new moral questions. Furthermore, the mere presence of technology did not demand the creation of a bioethical specialty to act as the arbiter of ethical questions. Several existing occupations could have risen to the call: lawyers, the clergy and social workers routinely give counsel in matters of life and death, and were available to advise on the use of new technology in the 1960s and 1970s.

Why is it important for neuroethicists to have a more nuanced understanding of the



history of their field? To the extent that they believe the techno-origin myth of their profession, they fail to see the larger context that gave rise to the specialty of bioethics. They are less inclined to appreciate the way in which funding sources, and the structure of industry and academic research, shape bioethics and neuroethics. Moreover, they ignore insights from the sociology of the professions that call attention to the tendency of occupational groups to become self-promoting and protective. Understanding both the nature of their social license—to stand in the gap between medicine and its patients—and the ease with which that license can be co-opted by the “medical–industrial complex” (Relman, 1980) will make neuroethicists more reflective about their roles.

Neuroethicists often compare their work with the bioethics work that accompanied the Human Genome Project, and call for a similar programme that mirrors the funding set aside to study the ethical, legal and social implications of the genome project (Illes & Racine, 2005; Roskies, 2002). Although it might seem wise for neuroethics to make these organizational and intellectual links to the established tradition of bioethics, it diminishes the potential opportunity to rethink the well-worn and tired ideas of bioethics. A cadre of new thinkers, and a new and unique field of study, should help bioethicists to rethink the way in which the system of principles (principlism) is used and misused. It should also challenge the concepts of the field that are taken for granted, such as the distinction between

invasive and non-invasive procedures or the celebration of autonomy over paternalism. But instead of bringing new insights and breathing fresh life into understanding the ethical problems of the life sciences, neuroethics has saddled itself with mainstream bioethics.

Neuroethics was formally organized into a society in May 2006. The *Stanford Report*, an online newspaper for the community of Stanford University (CA, USA), offers a brief description of the meeting at which the decision was taken to found the Neuroethics Society: “On a recent foggy day at the Asilomar conference center in Pacific Grove, [CA, USA] 13 experts in ethics, neurology, law and clinical medicine tipped their champagne glasses to celebrate the birth of a new society. The newly minted Neuroethics Society gives some heft to a field that Stanford researchers helped found in 2002... Topics addressed by neuroethics include the use of imaging techniques to predict brain diseases or personality traits, how researchers respond to anomalies found in the scans of healthy patients and the long-term use of brain altering drugs. The group got funding from the Dana Foundation to form the society” (*Stanford Report*, 2006).

As the report points out, organized interest in neuroethics pre-dates the creation of the Neuroethics Society. In 2002, researchers from Stanford University and the University of California, San Francisco (UCSF), USA, held a meeting entitled ‘Neuroethics: Mapping the Field’, which

brought together scientists, ethicists, humanists and social-policy experts to reflect on the implications of current and ongoing work in neuroscience. Several speakers at the conference explained that neuroethics was not new, and offered varied genealogies of the field: one began with Plato (Jonsen, 2002), and another with a meeting of poets and writers including Lord Byron, Percy Shelley and Mary Wollstonecraft Godwin held in a cottage on Lake Geneva in the summer of 1816 (Safire, 2002).

Zach Hall offered a more prosaic version of the birth of neuroethics, describing a trip made by William Safire, *New York Times* columnist and Chairman of the Dana Foundation (New York, NY, USA), to the Mission Bay Campus of UCSF. Hall, who is a member of the faculty there, recalled showing Safire around: “...we were talking about all the brain research that would be going on there. I said that we also hoped to have a bioethics center. As we were talking about the need for discussion of these issues with respect to the brain, Bill suddenly turned to me and said, *neuroethics*. It was like that magic moment—‘plastics,’ in the movie *The Graduate*. Bill said, ‘neuroethics,’ and I thought, ‘that’s it.’ It was a recognition that these problems are so serious and have such broad implications that they deserve a special designation” (Hall, 2002).

This transition from an idea to an organization underscores the importance of ‘acquiring a past’. As with the link to the history of bioethics, the founding of the Neuroethics Society at Asilomar lends

credibility to the new academic enterprise by creating a connection to the well-known meeting of geneticists that was held there in 1975. One of the participants at the 1975 meeting wryly observes: “testimony to the [Asilomar] conference’s success are the frequent calls to resurrect the ‘Asilomar Process’ to resolve the ethical dilemmas posed by newly emerging ideas and technologies” (Berg, 2004).

The fact that neuroethics is now an ‘organized specialty’ allows us to see who the key players are, who supports their work and how their interests—and, hence, the interests of the specialty as represented by the Neuroethics Society—are shaped by their social location. Among the six members of the executive committee and the seven members of the governing board of the Neuroethics Society, there are indeed scientists, ethicists and humanists, but nearly all, according to their web descriptions, are promoters of neuroscience and neurotechnology. Nine of these 13 have degrees in a branch of neuroscience such as neurobiology, neuropsychology, cognitive neuroscience or personality; the other four have degrees in philosophy, law or sociology, but at least two of these individuals are widely known for their enthusiasm for science and technology. Of course, close association with the field of neuroscience is a prerequisite for those who would be guardians of the field, but absent among the leaders of the Neuroethics Society are respected academics who have a critical view of neuroscience.

The creation of an organized specialty requires financial support, the source of which often determines the nature of the work that gets done and its conclusions. This is true for clinical research, where industry-supported researchers are more likely to discover that the drugs of their sponsors are efficacious (Bhandari *et al*, 2004). Funding by pharmaceutical companies can also direct the agenda of centres for ethics (De Vries, 2004). In the case of neuroethics, most funding has come from the Dana Foundation, which is a private philanthropic organization with a strong interest in the brain. Although philanthropic funding is preferable over funding from for-profit corporations that exist to enrich owners and/or shareholders, even philanthropies might have axes to grind. In the case of the Dana Foundation, its mission is clear: to support brain research, and

to provide information about the personal and public benefits of that research. Parens & Johnston (2006) worry about this enthusiasm and its effect on neuroethicists, and caution their fellow bioethicists that “irrationally exuberant modes of reductionism [...] can plague hot new arenas of scientific and technological development. [...] For example, proximity to geneticists may have made some of us ‘gen-ethicists’ too quick to accept claims about ‘genes for’ complex human traits or about the imminence of engineering them. Neuroscience—in particular, research using neuroimages [Illes & Racine, 2005]—might today be operating in an equally exuberant mode [Martensen, 2004].”

There is another deeper problem with the way neuroethics is funded, which neuroethicists share with other sorts of bioethicists: the obligations of the ‘gift’. As Douglas (1990) points out, “A gift that does nothing to enhance solidarity is a contradiction,” and her observation is amply supported by the works of Mauss (1990) and Hyde (1983). Clinicians have begun to recognize the hidden costs of gifts, and an increasing number are refusing the free lunches, pens and tickets to sporting events that are proffered by the pharmaceutical sales force—driven in large part by ‘No Free Lunch’, a not-for-profit organization that discourages the acceptance of such gifts.

However, bioethicists and neuroethicists are in a difficult place as, unlike clinicians, they have nothing to sell. Physicians who refuse free lunches are amply supported by their work in the clinic, but ethicists have no one to bill for services rendered. Given this structural problem, ethicists are disinclined to say ‘no’ to those who seek, and pay for, their advice. Those who do so will not only lose support for their work, but might also find themselves excluded from the conversation.

The work of neuroethicists reflects the ambivalence created by their social location. Neuroethical commentary reveals a ‘Jekyll-and-Hyde’ struggle between technophilia and technophobia: reading this work, we learn that neuroscience is frightening, but we also hear of ‘bold new findings’, ‘remarkable scientific discoveries’ and ‘potential’ that is ‘almost beyond comprehension.’ In this ambivalence, we see the problem of guarding the guardians—that is, of guards being captured by those they are sent to guard.

Consider the neuroethical work on brain imaging, for example. The ability to ‘see’ which portions of the brain react to certain stimuli has given rise to research on how humans make economic, ethical and political choices. Which part of the brain ‘lights up’ when we consider whether to throw a fat man in front of an approaching train? Does another part of the brain respond when asked to throw a switch and send the train down a track where it will kill a—presumably thin—workman (Greene *et al*, 2001)? Which part of our brain lights up when asked to choose between receiving a \$15 gift voucher today or a \$20 gift voucher a month from now (Cassidy, 2006)?

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The uncritical way in which neuroethicists respond to this research is surprising to a social scientist. Rarely do they comment on the fact that images of the brain are generated when a subject is lying in a functional magnetic resonance imaging machine. Do brains respond in identical ways in the artificial environment of a scanning machine and in natural environments? If researchers discover that those who can defer gratification use the pre-frontal cortex to deliberate on the gift-voucher question, whereas those who cannot resist \$15 today are using the limbic part of their brain, what does that tell us? Yes, neuroethicists recognize that the “reductionist approach of neuroimaging to human behavior [should] be made compatible and complementary to approaches represented by philosophy, sociology and anthropology” (Illes & Racine, 2005), but most of their work proceeds as if neuroimaging is telling us something real, important and frightening.

A central interest in neuroethics is brain science and social policy. Illes & Bird (2006) describe three areas of this interest: lie detection, cognitive enhancement and direct-to-consumer advertising. The authors point to fascinating and frightening possibilities. How will we use the ability to read the brain and detect deception? Does neural enhancement diminish our authenticity? How can personal autonomy be reconciled with the corporate marketing of health

products? Notice how the technophilia/technophobia tension shapes neuroethical questions, and also which questions are not asked. Missing from the discussion, for example, is a socio-economic critique of neuroscience. Little or no neuroethical comment can be found on the behaviour of pharmaceutical and medical device companies that have suppressed clinical trial data that might dampen sales and restrict markets (Dyer, 2004), or on the funding priorities of industries, governments, universities and foundations.

Neuroethics is part of the larger social movement of bioethics. Similarly to bioethics, neuroethics works on the premise of a need for an ethical specialist to oversee the work of scientists and researchers. Bioethics and now neuroethics are replacing an older model of medical ethics that drew on Aristotelian 'virtue ethics', which assumes that ethical behaviour flows from virtuous individuals—who are well-schooled in the humanities and attentive to the world around them—not from training in the responsible conduct of research, review of conduct by ethics committees and institutional review boards, or oversight by professional ethicists. Beginning in the late 1960s, for reasons briefly mentioned above, this model was turned on its head: rather than ethics guiding action, actions were subject to the review of professional ethicists who were called on to assess and direct the behaviour of clinicians and researchers.

What is the best way to promote a more ethical neuroscience? Although I do not doubt that we need ethical reflection on neuroscience and neurotechnology, I believe that we need to think critically about how to do this.

In her story, 'A Good Man is Hard to Find,' US writer Flannery O'Connor describes a family outing that goes wrong. Two parents and their children, along with the children's grandmother, leave their home in Georgia for a vacation in Florida. Along the way, the grandmother—a demanding and unpleasant woman—insists on a detour to see a plantation that she once visited. Her son reluctantly gives in, and while searching for this elusive destination they land in a ditch. No one is seriously harmed, but in this vulnerable state they encounter 'The Misfit', a prison escapee who, together with his accomplices, systematically begins to kill everyone in the family. The grandmother is the

last person alive, and as she pleads with The Misfit for her life, she begins to see him in a new light: "She saw the man's face twisted close to her own as if he were going to cry and she murmured, 'Why you're one of my babies. You're one of my own children!' She reached out and touched him on the shoulder. The Misfit sprang back as if a snake had bitten him and shot her three times through the chest." Walking away, The Misfit said, "She would of been a good woman if it had been somebody there to shoot her every minute of her life" (O'Connor, 1993).

The difficulty, of course, is getting someone to 'shoot us every minute of our lives'. In the case of neuroethics, it is important for its practitioners to remember their role as guardians and to avoid the predictable social processes that require guards for the guardians. Practically speaking, neuroethicists should make room for some misfits among their leadership—academics and lay people who will shoot them every minute of their organizational lives. The presence of a misfit or two will help neuroethicists to benefit from critical perspectives drawn from other disciplines, to generate a more reflexive approach to their work, and to become less self-protective and more useful in the task of humanizing neuroscience.

#### REFERENCES

- Berg P (2004) Asilomar and recombinant DNA. 26 Aug. [http://nobelprize.org/nobel\\_prizes/chemistry/articles/berg/index.html](http://nobelprize.org/nobel_prizes/chemistry/articles/berg/index.html)
- Bhandari M *et al* (2004) Association between industry funding and statistically significant pro-industry findings in medical and surgical randomized trials. *CMAJ* **170**: 477–480
- Bosch X (2006) Linking neurons and ethics. *Science* **311**: 339
- Carey B (2007) In clue to addictive behavior, a brain injury halts smoking. *New York Times*, 26 Jan
- Cassidy J (2006) Mind games: what neuroeconomics tells us about money and the brain. *The New Yorker*, 18 Sep
- DeVries R (2004) Businesses are buying the ethics they want. *Washington Post*, 8 Feb, pB2
- DeVries R, Turner L, Orfali K, Bosk C (2007) *The View from Here: Bioethics and the Social Sciences*. London, UK: Blackwell
- Douglas M (1990) No free gifts. In Mauss M (ed), *The Gift*, p x [foreword]. London, UK: Routledge
- Dyer O (2004) GlaxoSmithKline to set up comprehensive online clinical trials register. *BMJ* **329**: 590
- Emanuel EJ (1991) *The Ends of Human Life: Medical Ethics in a Liberal Polity*. Cambridge, MA, USA: Harvard University Press
- Farah MJ (2005) Neuroethics: the practical and the philosophical. *Trends Cogn Sci* **9**: 34–40
- Goleman D (2006) Friends for life: an emerging biology of emotional healing. *New York Times*, 10 Oct
- Greene JD, Sommerville RB, Nystrom LE, Darley JM, Cohen JD (2001) An fMRI

- investigation of emotional engagement in moral judgement. *Science* **293**: 2105–2108
- Hall Z (2002) Welcome. In Marcus SJ (ed), *Neuroethics: Mapping The Field*, pp 1–2. New York, NY, USA: Dana Press
- Hyde L (1983) *The Gift: Imagination and the Erotic Life of Property*. New York, NY, USA: Vintage
- Illes J, Bird SJ (2006) Neuroethics: a modern context for ethics in neuroscience. *Trends Neurosci* **29**: 511–517
- Illes J, Racine E (2005) Imaging or imagining? A neuroethics challenge informed by genetics. *Am J Bioeth* **5**: 5–18
- Jonsen AR (2002) Neuroethics: from Plato's republic to today. In Marcus SJ (ed), *Neuroethics: Mapping The Field*, pp 273–277. New York, NY, USA: Dana Press
- Knoppers BM (2005) Neuroethics, new ethics? *Am J Bioeth* **5**: 33
- Marcus SJ (ed) (2002) *Neuroethics: Mapping the Field*. New York, NY, USA: Dana Press
- Martensen RL (2004) Bioethics on the brain. *Med Humanit Rev* **18**: 27–45
- Mauss M (1990) *The Gift*. London, UK: Routledge
- O'Connor F (1993) *A Good Man is Hard to Find*. New Brunswick, NJ, USA: Rutgers University Press
- Parens E, Johnston J (2006) Against hyphenated ethics. *Bioethics Forum*, 8 Sep. [www.bioethicsforum.org](http://www.bioethicsforum.org)
- Relman AS (1980) The new medical-industrial complex. *N Engl J Med* **303**: 963–970
- Roskies A (2002) Neuroethics for the new millennium. *Neuron* **35**: 21–23
- Safire W (2002) Introduction: visions for a new field of 'neuroethics.' In Marcus SJ (ed), *Neuroethics: Mapping The Field*, pp 3–9. New York, NY, USA: Dana Press
- Stanford Report (2006) Illes helps launch neuroethics society. 12 Jul. <http://news-service.stanford.edu>
- Stevens MLT (2000) *Bioethics in America: Origins and Cultural Politics*. Baltimore, MD, USA: Johns Hopkins University Press
- Tierney J (2007) The voices in my head say 'buy it!' Why argue? *New York Times*, 16 Jan, pF1
- Wilfond BS, Ravitsky V (2005) On the proliferation of bioethics sub-disciplines: do we really need "genethics" and "neuroethics"? *Am J Bioeth* **5**: 20–21



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