



## Ipsa Scientia Potestas Est (Knowledge is Power)

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# Ipsa Scientia Potestas Est (Knowledge is Power)

Judy Illes, Stanford University

In July 2006, I co-chaired a symposium called “At the Ethical Frontier of Higher Brain Function Research” at the Japan Neuroscience Society (JNS) meeting in Kyoto, Japan. Together with the other symposium chairs, Osamu Sakurai and Tamami Fukushi, and the panelists, we explored the history of neuroethics since antiquity, its emergence in pre-modern and modern days, and the specific challenges that neuroethics has tackled over the past several years. We discussed, deliberated and debated the future into which forecasted issues could be framed.

Does this sound much like other milestone meetings in neuroethics? Perhaps. Indeed, we reviewed some familiar issues such as the need for proactive integration of ethics into neuroscience protocols (Illes et al. 2006), risks to privacy in a new age of neuroimaging (Illes and Racine 2005), and cognitive enhancement with drugs and devices (Farah and Wolpe 2004). But we also explored still-uncharted territory. Beyond public engagement, which has been broached as a first international theme for neuroethics (Illes et al. 2005), we openly spoke about the cross-cultural future for neuroethics and how health care systems, value and belief systems will factor into neuroethics priorities and the methods to pursue them (Chen 2006). We engaged in a discussion of a possible new frontier for animal neuroethics, hearing proposals for more humane means of acquiring neural signals using optical imaging techniques rather than conventional electrode implants, achieving motivational effects using social competition paradigms instead of food deprivation paradigms, and even of a 401K-type retirement plan for monkeys once their involvement in experiments is complete (as the alternative is not conducive to their longevity) (Fujii 2006).

In a satellite meeting to the JNS symposium, an office building conference room in the Otemachi Sankei Plaza office building in Tokyo held an overflow of people representing a diverse range of disciplines at the “The International Workshop of Neuroethics in Japan; Dialog on Brain, Society, and Ethics.” Themes overlapping with the JNS symposium were the need for practical ethics tools for neuroscien-

tists, privacy and rapid technology innovation. Unique to the workshop were themes focused on brain-machine technology that, for example, enables functional magnetic resonance imaging signals to drive movement (literally rock-paper-scissors) in a robotic hand. Members of the audience raised questions about whether humanoid robots can have “Kami,” a spirit, the capacity to value, and intrinsic motivation. To my own pointed challenges to proposals in favor of a robot spirit, Mitsuo Kawato replied that there is little human behavior that within 10 to 20 years will not be modeled algorithmically. Could he be right, given what studies by Antonio Damasio (2003) and others have revealed about human emotion, creativity, and consciousness? Is our behavior really so linear? I remained skeptical, albeit intrigued. I certainly began to wonder where bioethics, as a “discipline that combines biological knowledge with a knowledge of human value systems” (Potter quoted in Jonsen 2003, 27), should go next with respect to neuroethics, given these predictions of computational neuroscience alone. What then will regenerative medicine and nanotechnology bring (Khushf 2004)? How will forces of biocapitalism factor in?

It is said that the special status of the brain was already appreciated in 400 BC. Hippocrates believed that, “the brain is the material substrate underlying cognitive and affective powers. It ought to be generally known that source of our pleasure . . . grief . . . is none other than the brain. [It is the . . . seat of madness, fear, fright . . . eccentricity . . .” (quoted in Gross 1998, 13). There was no shortage of 17th- and 18th-century thought leaders who, two millennia later, provided the first anatomoclinical correlations of brain and behavior (Marshall and Fink 2003) or those that support this view today. As Leshner (2005, 1–2) wrote in the *American Journal of Bioethics*, “[n]ow that the brain is well accepted as the seat of the mind, it takes on additional qualities as the seat of the ‘self’, the place where our individual personalities reside.”

In this century, behavior is no longer reduced directly to the function of a single gene; instead, behavior is increasingly seen to be an emergent property of a distributed

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processing information system, synapses and neurotransmission (Churchland 2006; Greely 2002; Hyman 2002). Partly as a function of the complexity of the central nervous system and partly a result of new interventions to understand and change central nervous system, we are faced with a field called *neuroethics*, whether or not we like that it exists with its own name and identity. Neuroethics, as defined by researchers such as Michael Gazzaniga (2005), is:

... more than just bioethics for the brain. [It] is the examination of how we want to deal with the social issues of disease, normality, mortality, lifestyle, and the philosophy of living informed by our understanding of underlying brain mechanisms. It is—or should be—an effort to come up with a brain-based philosophy of life. Foundation:

Defined by champions of neuroscience such as William Safire of The Dana Foundation:

Neuroethics [is] the examination of what is right and wrong and good and bad about the treatment of, perfection of, or unwelcome invasion of and worrisome manipulation of the human brain [...] It deals with our consciousness—our sense of self—and as such is central to our being (quoted in Marcus 2002, 5).

These convictions and others bring us to a common message: neuroethics is for everyone—theoreticians, philosophers, researchers, clinicians, lawyers, engineers, and all citizens of science.

To this end, it is my great pleasure to launch *AJOB–Neuroscience* with this inaugural issue. *AJOB–Neuroscience* will:

- foster international discourse and promote global thinking in neuroethics;
- provide a platform for debating current issues in neuroethics; and
- enable the incubation of new themes and emerging priorities in neuroethics.

The overriding goal is to capture the clear cross-disciplinary excitement about neuroethics and capitalize on the extraordinary momentum it has acquired. *AJOB–Neuroscience* will embrace broad thinking and provide a platform for dialogue and exchange. It will provoke debate. It will be intolerant only of intolerance. The position and target papers in this inaugural issue, “Neuroscience and Ethics: Intersections” by Antonio Damasio, “The Neurobiology of Addiction: Implications for Voluntary Control of Behavior” by Steve Hyman (who has, among other accomplishments, just been named the first President of the new Neuroethics Society), and “Personhood and Neuroscience: Naturalizing or Nihilating?” by Martha Farah and Andrea Heberlien, fully reflect the open perspective and the range of topics we will handle.

Our board of editorial advisors is no less distinguished and multidisciplinary. Let me extend my deepest thanks to Colin Blakemore, Patricia Churchland, Martha Farah, Adrian Ivinson, John Mazziotta, and Barbara Sahakian, who, together with *AJOB* Editors Glenn McGee, David Magnus, Paul Wolpe, and Sean Philpott, not only shared this vi-

sion but also worked tirelessly to assist me in getting this project out of the starting block.

Welcome to *AJOB–Neuroscience*. Build on the past. Think aloud. Challenge the mundane. Take risks. Contribute.

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