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GUEST EDITORIAL

Neurolaw—A Call to Action

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Neuroethics has, in recent years, established itself as a subfield to be taken notice of by the wider neuroscientific community and beyond. This is probably at least in part the result of a fortunate (or unfortunate, depending on perspective) confluence of scientific developments, deemed to be "controversial" by the news media and other commentators. Whether these developments—things such as the partial "revival" of pig neural activity using the BrainEx technique,[1] the rising numbers of sensationalized stories about neuroscience,[2] or the rise in public awareness of cognitive implant technologies precipitated by the sudden interest from technology moguls[3]—really are as controversial as they are painted to be is a matter for those reading this to judge, but their presentation as such can only be good for neuroethics and neuroethicists. More space to make public comment, to inform, to explain outside the academy—such opportunities both strengthen the field and oblige the developers of these technologies to pay more attention, as the interest and knowledge of the public grows.

With this new stature behind us, I call upon neuroethicists and indeed neuroscientists to turn their attention to a smaller sister subfield, desperately in need of amplification. Neurolaw is well established, but perhaps for the most part seen as a sideline for philosophers who like to veer occasionally into jurisprudence, and legal academics who enjoy a little interesting science in their research.[4] It is a somewhat ill-defined area of study, which can be deployed variously but broadly refers to that interplay between jurisprudence, legal decisionmaking, and our increasingly detailed knowledge about the workings of the brain. We might, in general, divide it into two interrelated sets of questions: the practical or empirical, regarding neurological evidence in legal cases and in investigating or mitigating behaviors that such evidence may influence; and the more conceptual, asking how discoveries and advances in neuroscientific understanding may bear on legal theory, and how we might change law itself and incorporate neuroscientific research findings directly into legal doctrine.

These topics may not appear, initially, to be of overt concern to neuroethicists without a core interest in law. Indeed, the same seems to be largely true in legal academia. On taking up a new position in a British law school recently, the quizzical or bemused remarks of colleagues upon being told I will be teaching a topic on neurolaw in our research-led Masters course surprised me. Not to indulge anecdotal evidence, but discussing with other colleagues elsewhere, I realized this was a quite common reaction. There are not very many courses available on neurolaw, certainly in the United Kingdom—there do appear to be several available in the United States and elsewhere, but it is far from a common offering.

I would like to point out here that I in no way intend to diminish the volumes of excellent work around aspects of neurolaw that have been published (some in the pages of this very journal[5]) over the last decade or more—there are far too many examples to provide here.[6] Rather, I feel many of them have gone unnoticed by the wider fields of law and bioethics, and given their subject matter, I cannot reason why.

Neuroscience stands to influence the law in myriad ways, some of which are deeply challenging. In the realm of the practical alone,

> Evidence obtained from emerging neurotechnologies might conceivably be used by law enforcement, the courts, regulatory agencies and others as factors in predicting dangerousness; assessing competence to stand trial; assessing volitional control over actions; revealing mitigating factors

relevant to sentencing; predicting recidivism; distinguishing pain from malingering; verifying intent; and manipulating memories.[7]

The list could continue. Each of these potentialities—and in several cases, extant realities in courtrooms—raises serious ethical quandaries. The same is true of conceptual neurolegal issues—can there be criminal responsibility if free will is a fiction? Can we justly punish offenders? Does legal personality—and do legal rights—collapse if personal identity can be changed with a neurostimulator or implant? Here is not the place to expound on all of these—or indeed the more "traditional" neuroethical issues that arise from the very use of the types of neurotechnology or brain-state data in question. Readers will be abundantly familiar with them already. The issue I wish to highlight is a simpler one, and one which we in neuroethics are well positioned to intervene in.

There is an impetus within legal systems today to introduce more and more science wherever possible. The reasons are again many: from jurisprudential desire that law should be as egalitarian as possible; to public policy concerns that legal decisions must be as certain, as factually accurate as they can be; to the mere pragmatic fact that there are (at least in England) huge backlogs of cases[8] that need to go to trial and must be sped through the system however possible. Although this impetus is not limited to the use of neuroscience—artificial Intelligence, for example, raising its own concerns[9]—anything that might bias a stakeholder or decisionmaker to incorporate a technology where it may not be strictly necessary ought to at least worry us as techno-ethicists—and I have not explored the potential for their use in bad faith.

We have seen already attempts to use various mind-reading or "thought-identification" technologies in the courtroom, when those technologies are, at best, highly questionable.[10] The motives for attempting to do so may well be good—but the desires belying those motives are fertile ground for mistakes to be made, and perhaps even exploitation by the less scrupulous who see an opportunity to sell a technology to the legislature. Neuroscience is an impressive field, promising so much in realms that few outside it comprehend, and it is very understandable that one might be "dazzled by science." A reliable, valid lie detector sounds like the solution to many problems. The potential issues, which I have not space to explore as they might warrant, may be significant threats to freedom, to rights, and to our understandings of ourselves. Whether it is something we deliberately avoid engaging with as academics or not, the law is and shall always be the way in which we structure our society—and enact and enforce those things we believe to be morally desirable.

As neuroethicists, with our newfound—if modest—platforms, I contend it is our duty to raise awareness of these possible threats. This may be through policy engagement, public commentary, or it may be through working with our colleagues in neuroscience. They may be pursuing a neurotechnology for all the right reasons—but rarely, I think, with concern toward the impact they may have on the law.

Notes

1. Vrselja Z, Daniele S, Silbereis J, Talpo F, Morozov Y, Sousa A, *et al.* Restoration of brain circulation and cellular functions hours post-mortem. *Nature* 2019;**568**(7752):336–43.
2. The latest to make major headlines at the time of writing being: Wetzel C. Brain scans of dying man suggest life flashes before our eyes upon death. *Smithsonian Magazine* 2022 Feb 28; available at https://www.smithsonianmag.com/smart-news/brain-scans-suggest-life-flashes-before-our-eyes-upon-death-180979647/ (last accessed 2 Mar 2022).
3. See, for example, stories around Neuralink: Wakefield J. Elon Musk"s brain chip firm denies animal cruelty claims. *BBC News* 2022 Feb 15; available at https://www.bbc.co.uk/news/technology-60391099 (last accessed 2 Mar 2022); and its competitors such as Synchron: McBride S. Bloomberg—Are you a robot? *Bloomberg.com* 2022 Feb 5; available at https://www.bloomberg.com/news/articles/2022-02-05/both-startups-are-making-devices-that-they-ll-implant-in-human-brains (last accessed 2 Mar 2022).
4. Which is not to say that some readers may not themselves be specialists in the area, but I think they would acknowledge their minority.

5. Such as Kellmeyer P. Ethical and legal implications of the methodological crisis in neuroimaging. *Cambridge Quarterly of Healthcare Ethics* 2017;**26**(4):530–54; and recently Suskin Z. Lady justice may be blind, but is she racist? Examining brains, biases, and behaviors using neuro-voir dire. *Cambridge Quarterly of Healthcare Ethics* 2021;**30**(4):702–9.
6. Examples I have recently made use of in teaching neurolaw include, among others: Morse SJ. Neuroethics: Neurolaw. *Oxford Handbooks Online* 2017; available at https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199935314.001.0001/oxfordhb-9780199935314-e-45 (last accessed 2 Mar 2022); Brown E, Is neurolaw coming soon to a courtroom near you? Scientific American 2019; available at https://www.scientificamerican.com/article/is-neurolaw-coming-soon-to-a-courtroom-near-you/ (last accessed 2 Mar 2022); Ienca M, Andorno R. Towards new human rights in the age of neuroscience and neurotechnology. *Life Sciences, Society and Policy* 2017;13:5; Farah MJ, Hutchinson JB, Phelps EA, Wagner AD. Functional MRI-based lie detection: Scientific and societal challenges. *Nature Reviews. Neuroscience* 2014;**15**:123–31; Bublitz J. The soul is the prison of the body: Mandatory moral enhancement, punishment & rights against neuro-rehabilitation. In: Birks D, Douglas T, eds. *Treatment for Crime: Philosophical Essays on Neurointerventions in Criminal*. Oxford: Oxford University Press; 2018:289–320; Harris J. Moral enhancement and freedom. *Bioethics* 2010;**25**(2):102–11.
7. U.S. National Academies of Sciences, Engineering, and Medicine. *Neuroscience and the Law: Exploring the Legal Implications of Emerging Neurotechnologies—A Workshop*; 2018; available at https://www.nationalacademies.org/event/03-06-2018/neuroscience-and-the-law-exploring-the-legal-implications-of-emerging-neurotechnologies–a-workshop (last accessed 2 Mar 2022).
8. Boycott O. Criminal justice system is "on its knees," says top English lawyer. *The Guardian* 2020 Nov 19; available at https://www.theguardian.com/law/2020/nov/19/criminal-justice-system-is-on-its-knees-says-top-english-lawyer (last accessed 2 Mar 2022).
9. Sourdin T. Judge v Robotrobot? Artificial Intelligence intelligence and Judicial judicial Decisiondecision-Makingmaking. *University of New South Wales Law Journal* 2018;**41**(4):1114–33.
10. Harris J, Lawrence D. Hot baths and cold minds. *Cambridge Quarterly of Healthcare Ethics* 2015;**24**(2):123–34.

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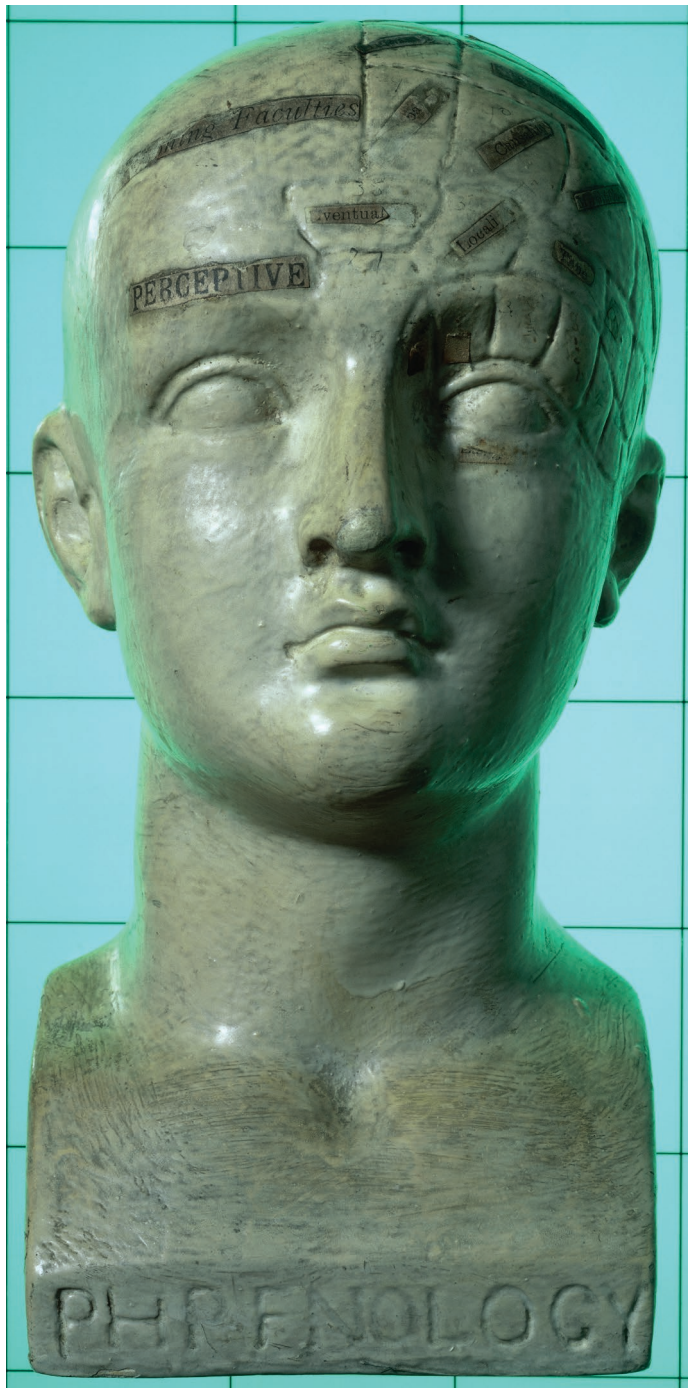

Phrenological head, 19th century, Location: Museum of London, Great Britain
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