

Introduction: law and neuroscience

Michael Freeman

The articles in this Special Issue of the journal explore diverse issues, but all in different ways are stimulated by developments in our understanding of the brain. It is coming to be understood that developments in neuroscience can help those who make the law and those who study it use the insights of scientific knowledge to assist in the understanding of human behaviour. Developments in cognitive neuroscience offer new insights into the nature of normative judgement. As Casebeer and Churchland (2003, p. 170) have noted, ‘the neurobiology of moral cognition is a justifiably hot topic’. As Goodenough and Prehn (2004, p. 1713) note, ‘the great advantage of the cognitive neuroscience approach is that we can now bring together psychological models of cognitive and affective process, experimental paradigms, various behavioural and psychophysiological measurements and functional brain imaging techniques’. Greene and Cohen have argued (2004, p. 1775) that neuroscience will probably have a transformative effect on the law, even though existing legal doctrine can, in principle, accommodate its findings. They foresee, and indeed recommend, a shift away from punishment rooted in retribution towards one adopting a consequentialist approach to the criminal law. That the US Supreme Court in 2005 (see *Roper v. Simmons*) eventually came to view the death penalty as unconstitutional for offenders who committed their offences when under 18 is in part the product of this shift in thinking. Steinberg and Scott (2003) had shown that adolescents did not meet the law’s requirements for rationality and so were unsuitable candidates for the death penalty.

It should not be thought that the findings and insights of neuroscience are of value only in the area of criminal law and punishment. Stake has shown that ‘fundamental principles of property are encoded in the human brain’ (2004, p. 1763). Rather as humans share a common grammar (Pinker, 1994) – despite the many languages in which they speak – so they may share a core property instinct, though the law of property is far from uniform across the world’s legal systems. In all areas of civil law, including family law, there is the promise of delivery of better justice. Thinking about litigation – why it is undertaken, what claimants want from it, what they are prepared to take, settlement processes – may be better understood (see O’Hara and Yarn, 2002). Since neuroscientists (and neuroeconomists) have come to an understanding about our ‘theory of mind mechanisms that enable us to glean and interpret the understandings, behaviour and intentions of others’ (O’Hara, 2004, p. 1681), we are better able to make judgements about such matters as trust. Neuroscience may assist in the better understanding of trustworthiness: this will have implications for many areas of law, particularly those which rely on agency (and see Blair and Stout, 2001).

This issue opens with James Grant on ‘determinism, neuroscience and responsibility’. He questions the concern, widely expressed, that freedom and responsibility are excluded by determinism. It is his view that determinism is required for responsibility (see also Morse, 2004). He argues that the neuroscience of correlation and determinism are compatible with freedom and responsibility.

Neil Feigenson’s essay is on functional magnetic resonance imaging (fMRI). This has already been used in two reported legal cases in the U.S. and will doubtless spread to other jurisdictions (*Entertainment Software Association v. Blagojevich*, 2005 and *Entertainment Software Association v. Granholm*, 2005). As Feigenson states, it is inevitable that fMRT-based evidence will be put forward in courts as proof of matters involving parties’ mental states and capabilities. It has already yielded insights into the physiological bases for human cognitions, perceptions and judgements (see Greene, 2003). Its potential legal uses are many, ranging from understanding *mens rea* to declaring brain

death to detecting deception by witnesses (Spence et al, 2004). Concerns about its use in court tend to focus on its use by jurors, rather than judges. Feigenson is cautiously optimistic about the value of fMRI in courts. It is important, he stresses, that experts and lawyers educate those who try cases to interpret the images properly. As ever, it is important to rely on the best available scientific knowledge.

It is increasingly recognised that those who are injured as a result of medical accidents who subsequently bring malpractice actions are not, or are not primarily, seeking monetary compensation (Merry and McCall Smith, 2001; Kennedy Report, 2001). Edward Dauer's paper examines data from the U.K., the U.S. and New Zealand on patients' motivations for making legal complaints after a medical error. As expected, he did not find financial compensation to be the main motivating factor: rather there were the wish for an apology or recognition of the harm done (what he calls 'Communication'); the desire for revenge (he categorises this as 'Punishment'); and a concern that others should not suffer in the future ('the Correction' motive, he calls it). The theory of what he calls 'strong reciprocity' in behavioural evolution fits the data well. Indeed, not only does evolutionary theory throw light on the data: the data, Dauer believes, is empirical support for the theory itself.

Evolutionary analysis, and neuroscience data, is embedded in June Carbone and Naomi Cahn's paper as well. They examine the insights that the biology of attachment offers for understanding the relationship between family law and family stability. Of course, if evolutionary analysis is going to be of value to law anywhere, it is likely to be in family law. Their conclusions are important: that evolutionary analysis, disconnected from neuroscience or sociological data, is highly speculative. Where either or both of these bears it out, it is more persuasive. But at the very least it raises new questions. For example, and particularly significantly, there is the question of whether biology can help us make sense of the transformation of family law which is happening throughout the developed world.

Cheryl Boudreau's paper throws light on the working of the jury system. There is considerable literature on this (Constanzo and Constanzo, 1994; Wiener et al., 1995; Fuselgang and Dunbar, 2004). Boudreau's paper is rather different. Accepting that jurors may not possess legal or scientific sophistication, she demonstrates that various institutions within the legal system – penalties for lying and the threat of verification – can substitute for sophistication, thus enabling jurors to learn what they need to know to perform their role. This research, far from undermining the concept of jury trial, supports its retention and points the way forward.

For Christina Spiesel it is obvious that the digital revolution has changed the relationship between words and pictures. The significance of this for lawyers may not yet have been grasped. Spiesel points to ways of understanding this. Pictures can, of course, impress themselves upon us in ways in which words do not. Will the word 'sunflower' ever separate itself in our thinking process from Van Gogh's famous painting? Music may have a similar impact: I have never seen Hartmann's pictures immortalised in Mussorsky's score, but the image of rich and the poor Jew, for example, is firmly imprinted upon my mind. And, despite the music's clear anti-semitic undercurrent, if I try to conjure up the image in my mind of such stereotypes, it is one drawn from the music. Spiesel looks at eye movement research focused on reading both words and pictures for the clues it gives us about cognitive processing and the differences between words and pictures as texts.

Claire Grant's is an essay in jurisprudence, indeed in a rather neglected question of jurisprudence. It is about promulgation and whether this is an essential pre-condition to law. She argues for artefactuality, for the proposition that laws are 'things' that can be known, and distinguishes her case from that of H.L.A. Hart and Lon Fuller. Though not immediately apparent what this has to do with 'mind and brain', it is clear that there are cognitive processes involved which neuroscience may be able to explain. The paper certainly raises questions for students of neuroscience and the law to grapple with.

References

- BLAIR, M. M. and STOUT, L. A. (2001) 'Trust, Trustworthiness, and the Behavioural Foundations of Corporate Law', *University of Pennsylvania Law Review* 149: 1735–810.
- CASEBEER, W. D. and CHURCHLAND, P. S. (2003) 'The Neural Mechanisms of Moral Cognition: A Multi-Aspect Approach To Moral Judgement and Decision-Making', *Biological Philosophy* 18: 69–194.
- CONSTANZO, S. and CONSTANZO, M. (1994) 'Life of Death Decisions: An Analysis of Capital Jury Decision-Making under the Special Issues Sentencing Framework', *Law and Human Behaviour* 18: 151–70.
- Entertainment-Software Association v. Blagojevich* (2005), 404 F. Supp. 2d. 1051 (N.D. ILL).
- Entertainment-Software Association v. Granholm* (2005), 404 F. Supp. 2d. 978 (E.D. Mich.).
- FUGELSANG, J. A. and DUNBAR, K. N. (2004) 'The Cognitive Neuroscience Framework for Understanding Causal Reasoning and the Law' in *Law and the Brain*. London: Philosophical Transactions of The Royal Society, 1749–1754.
- GOODENOUGH, O. R. and PREHN, K. (2004) 'A Neuroscience Approach to Normative Judgment in Law and Justice' in *Law and the Brain*. London: Philosophical Transactions of The Royal Society, 1709–26.
- GREENE, J. (2003) 'From Neural "is" to Moral "Ought": What are the Moral Implications of Neuroscientific Moral Psychology?', *Nature Reviews Neuroscience* 4: 847–9.
- GREENE, J. and COHEN, J. (2004) 'For The Law, Neuroscience Changes Nothing and Everything' in *Law and the Brain*, London: Philosophical Transactions of The Royal Society 1775–1786.
- KENNEDY, I. (2001) *Report of The Inquiry into Bristol Royal Infirmary*. London: HMSO (Cm. 5207).
- MERRY, A. and MCCALL SMITH, A. (2001) *Errors, Medicine and the Law*. Cambridge: Cambridge University Press.
- MORSE, S. (2004) 'New Neuroscience, Old Problems' in B. Garland (ed.), *Neuroscience and the Law: Brain, Mind and the Scales of Justice*. New York: Dana Press.
- O'HARA, E. A. (2004) 'How Neuroscience Might Advance The Law' in *Law and the Brain*, London: *Philosophical Transactions of The Royal Society*, 1677–1684.
- O'HARA, E. A. and YARN, D. (2002) 'On Apology and Consilience', *Washington Law Review*, 77: 1121–92.
- PINKER, S. (1994) *The Language Instinct*. New York: W. Morrow.
- SPANCE, S., HUNTER, M. D., FARROW, F. D., GREEN, R. D., LEUNG, D. H., HUGHES, C. J. and GANESAN, V. (2004) 'A Cognitive Neurobiological Account of Deception: Evidence from Functional Neuroimaging' in *Law and the Brain*, London: *Philosophical Transactions of The Royal Society*, 1755–1762.
- STAKE, J. E. (2004) 'The Property "Instinct"' in *Law and the Brain*, London: *Philosophical Transactions of The Royal Society*, 1763–1774.
- STEINBERG, L. and SCOTT, E. S. (2003) 'Less Guilty By Means of Adolescence: Developmental Immaturity, Diminished Responsibility, and the Juvenile Death Penalty', *American Psychologist*, 58: 1009–18.
- WIENER, R. L., PRITCHARD, C. C. and WESTON, M. (1995) 'Comprehensibility of Approved Jury Instructions in Capital Murder Cases', *Journal of Applied Psychology* 80: 455–67.