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MIRROR NEURONS, THE NEW NEUROSCIENCE, AND THE LAW: SOME PRELIMINARY OBSERVATIONS

Timothy P. O'Neill*

In 2006, V.S. Ramachandran wrote that the history of scientific thought over the last few centuries has been marked by four revolutions.¹ The Copernican revolution removed Earth as the center of the universe. The Darwinian revolution introduced the concept of evolution. The Freudian revolution gave prominence to the unconscious as the source of human drives and behavior. And the DNA revolution changed our concept of genetics.

Ramachandran posits that we are in the midst of a fifth revolution: the “neuroscience revolution.”² He relates this to what Francis Crick once referred to as “the astonishing hypothesis”: the idea that all conscious activity and sense of self is based ultimately on the billions of nerve cells—neurons—in our brains.³

Ramachandran then referred to one of the most important elements of this “neuroscience revolution”: the concept of “mirror neurons.”⁴ Mirror neurons were discovered in 1995⁵ through the work of Iacomo Rizzolati

* Professor of Law, The John Marshall Law School. This Article is dedicated to my children, Erin and Shane, who have been both a joy and an inspiration to me.

1. V.S. Ramachandran, *Mirror Neurons and the Brain in the Vat*, EDGE, Jan. 10, 2006, http://www.edge.org/3rd_culture/ramachandran06/ramachandran06_index.html.

2. *Id.*

3. *Id.* (referencing FRANCIS CRICK, *THE ASTONISHING HYPOTHESIS: THE SCIENTIFIC SEARCH FOR THE SOUL* (1994)).

4. Ramachandran, *supra* note 1.

5. John Brockman, *Introduction to V.S. Ramachandran, Mirror Neurons and the Brain in the Vat*, EDGE, Jan. 10, 2006, http://www.edge.org/3rd_culture/ramachandran06/ramachandran06_index.html.

and Vittorio Gallasse.⁶ In working with macaque monkeys, Rizzolati and Gallasse found that certain neurons “fired” any time the monkeys performed a complex act, such as reaching for a peanut or pulling a lever, with different neurons “firing” for different actions.⁷ Although most of the neurons controlled motor skills, Rizzolati and Gallasse found that a subset of them would fire even when the monkeys merely *watched* another monkey perform the same action.⁸ Ramachandran said, “In essence, [this type of] neuron is part of a network that allows you to see the world ‘from the other person’s point of view,’ hence the name ‘mirror neuron.’”⁹ Ramachandran also referred to them as “empathy neurons” or “Dalai Lama neurons.”¹⁰ He used the latter term because mirror neurons appeared to help break down the “self vs. other” barrier, creating the sense of “oneness” sought by certain Eastern philosophical and mystical traditions.¹¹

Ramachandran predicts that mirror neurons may do for psychology what DNA did for biology: provide a unifying framework to help explain observations that have hitherto been unexplainable.¹² For example, psychotherapy has long relied on the concepts of transference and countertransference.¹³ In transference, a patient “transfers” feelings about crucial figures in her life onto the therapist.¹⁴ Similarly, in “countertransference,” the therapist’s reactions to the patient are shaped by the therapist’s own prior relationships.¹⁵ Dr. Daniel Siegel, the director of the Center for Human Development in Los Angeles, says that mirror neurons provide a neurobiological basis for these phenomena.¹⁶ Siegel suggests that therapists should more consciously use their own mirror system to understand and empathize with patients; additionally, therapists should explain the mirror system to patients to help them understand that

6. MARCO IACABONI, MIRRORING PEOPLE: THE NEW SCIENCE OF HOW WE CONNECT WITH OTHERS 8-12 (2008).

7. “When neurons become active (a state known in neuroscience jargon as ‘firing’), an electric current is propagated away from the cell body and down the axon.” ANTONIO R. DAMASIO, *DESCARTES’ ERROR* 29 (1994).

8. Ramachandran, *supra* note 1.

9. *Id.*

10. *Id.*

11. *Id.*

12. *Id.*

13. Sandra Blakeslee, *Cells That Read Minds*, N.Y. TIMES, Jan. 10, 2006, at F4.

14. *Id.*

15. *Id.*

16. *Id.*

many of their experiences may be the result of what people have said or done to them in the past.¹⁷

What relevance do mirror neurons have to law? Thus far, there have been very few references to this concept in the law review literature.¹⁸ The purpose of this Article is to offer some preliminary observations on mirror neurons' relevance to law, particularly with respect to decision-making by both judges and juries.

Let's begin by looking at one specific issue in American intellectual history and then see how mirror neurons may aid our understanding.

Gordon S. Wood, in his book *The Radicalism of the American Revolution*, wrote about the sea change that had to occur in American society before Thomas Jefferson could write "all men are created equal" in the Declaration of Independence.¹⁹ Wood asserts that by the early nineteenth century, American society was fundamentally different from eighteenth century colonial society. In fact, America in the early nineteenth century was "a new society unlike any that had ever existed anywhere in the world."²⁰ The American Revolution did more than simply alter the personal and social relationships that previously existed in American society; more significantly, it actually destroyed the concept of aristocracy as it had been understood by the Western world for at least 2000 years.

Prior to the Revolution, American society could be divided into two classes: gentlemen and commoners—or aristocrats and ordinary people—with gentlemen comprising roughly ten percent of the population of the northern colonies of North America.²¹ Wood emphasizes that we cannot underestimate the extent to which these two classes were viewed as "two orders of being."²² He points out the number of contemporary references that compared commoners to "cattle"—literally unthinking animals.²³ George Washington, for example, referred to ordinary farmers as "the

17. *Id.*

18. As of March 3, 2010 a LexisNexis search of the law review and journal database showed only fifteen articles that refer to "mirror neurons," with most of the references confined to footnotes. Two new articles, however, include slightly more extensive discussions. See Peggy Sasso, *Criminal Responsibility in the Age of "Mind Reading"*, 46 AM. CRIM. L. REV. 1191, 1234-36, 1244 (2009); Andrew E. Taslitz, *Why Did Tinkerbelle Get Off So Easy?: The Roles of Imagination and Social Norms in Excusing Human Weakness*, 42 TEX. TECH L. REV. 419, 436 (2009).

19. GORDON S. WOOD, *THE RADICALISM OF THE AMERICAN REVOLUTION* 6 (1992).

20. *Id.*

21. *Id.* at 25.

22. *Id.* at 27.

23. *Id.*

grazing multitude.”²⁴ John Adams called them “the common Herd of Mankind.”²⁵ Wood concludes that “we will never appreciate the radicalism of the eighteenth-century revolutionary idea that all men were created equal unless we see it within this age-old tradition of difference.”²⁶

Wood argues that the change towards egalitarianism in American society could be attributed to a variety of Enlightenment ideas: republicanism, liberalism, democracy, rationalism, and capitalism.²⁷ Yet this does not explain exactly *how* these values gained acceptance in the late eighteenth century.

On this issue, Lynn Hunt offers a very intriguing theory in her recent book *Inventing Human Rights*.²⁸ She agrees with Wood that there was a traditional gap between the aristocracy and commoners, and that the aristocracy simply did not believe that commoners had inner sensibilities.²⁹ She also agrees that significant changes occurred in America following the Revolution.³⁰ But Hunt’s thesis is that “any account of historical change must in the end account for the *alteration of individual minds*. For human rights to become self-evident, ordinary people had to have *new understandings* that came from *new kinds of feelings*.”³¹

In explaining how this may have occurred, Hunt focuses on the so-called “epistolary novels” of the mid-eighteenth century.³² These were novels that told stories completely through letters written by the characters.³³ Among the most famous were *Julie*, by Jean-Jacques Rousseau, and two novels by Samuel Richardson: *Clarissa* and *Pamela*. What these novels illustrated was the revolutionary idea that women—and not just middle-class women like Julie and Clarissa, but even a lower-class servant such as Pamela—actually had mature inner-lives. They were not cattle; they were reflective human beings with complicated emotional lives. In this way, they were no different from the American and European aristocrats who comprised much of the novels’ audience. That the lower and upper classes could be so fundamentally similar was a truly revolutionary idea to eighteenth-century aristocrats.

24. *Id.*

25. WOOD, *supra* note 19, at 27.

26. *Id.*

27. *See id.* at 7.

28. LYNN HUNT, *INVENTING HUMAN RIGHTS* (2007).

29. *Id.* at 38, 40.

30. *Id.* at 121.

31. *Id.* at 34 (emphasis added).

32. *Id.* at 38-50.

33. *Id.* at 38-39.

Professor Hunt asserts that the impact of these novels should not be underestimated. By illustrating the common humanity of all people, they laid the groundwork for Enlightenment ideas such as liberalism and democracy.³⁴ Human rights could flourish not just when people thought of equality in some abstract philosophical sense, but when they could actually think of others as being like themselves in some fundamental way. For the Enlightenment to take root, people had to be able to identify with people across class, sex, and national lines. Hunt concludes, “Learning to empathize opened the path to human rights.”³⁵

Therefore, if we assume that Gordon S. Wood is correct—that the American Revolution resulted in a reorganization of society based upon Enlightenment ideas of human rights—and if we assume that Lynn Hunt is correct—that the idea of human rights is ultimately based upon the ability to empathize across class and gender lines—then we must next ask what the mechanism is in our brains that allows humans to empathize.

Here is where the concept of mirror neurons comes into play. Mirror neurons provide a neurobiological explanation for how we are able to empathize.

But first, what is “empathy”? It is a concept that goes back over a century to the German psychologist Theodor Lipps.³⁶ In trying to describe a person’s relationship with art, Lipps created the term *Einfühlung*, which has been translated into English as “empathy.”³⁷ Lipps described it as the act of projecting oneself into the object of a perception.³⁸ For example, when you watch a tightrope walker, you can actually feel yourself inside her body balancing on the wire. Lipps extended this to positing that empathy also allows us to generally experience and understand the feelings of others.³⁹

The concept of mirror neurons explains how we empathize in neurobiological terms. While neurons are simply brain cells, mirror neurons are those particular brain cells that try to understand and make sense of outside stimuli.⁴⁰ They accomplish this by internally simulating

34. HUNT, *supra* note 28, at 38, 40.

35. *Id.* at 68.

36. IACOBONI, *supra* note 6, at 108-09.

37. *Id.* at 108.

38. *Id.* at 109.

39. *Id.* at 108-09.

40. See Blakeslee, *supra* note 13, at F4.

what you are externally experiencing.⁴¹ In other words, they literally “mirror” outside activity.⁴²

As discussed earlier, any neuron can become active through a process known as “firing.” When this occurs, an electric current is sent away from the cell body down a stem called an axon, and then into other parts of the brain.⁴³

For example, assume you are watching a soccer game and you see a player kick the ball.⁴⁴ Mirror neurons will help you to understand what a kick is by “firing”—that is, activating—those areas of the brain that would be responsible for kicking if you were actually the kicker. This happens even if you are sitting completely still and not moving a muscle. What is even more amazing, this neurological “firing” will occur not only if you *see* someone kick a ball, but also if you simply *hear* the word “kick.”⁴⁵

The next issue, then, is why? Some neuroscientists believe that empathy is the result of the human instinct to imitate⁴⁶ (just think of the last time you saw someone yawn). For example, when a stranger approaches, you must quickly identify him as a friend or foe. In order to do this, the brain will actually “mirror” the actions, tone of voice, and facial expressions of the stranger. The brain’s goal is to make you *feel* the way the stranger *looks*. If you are able to actually feel as if you were inside the stranger, you can then determine whether he should be welcomed or feared.⁴⁷ In other words, the brain’s mirroring actually comes before understanding. As expressed by Giacomo Rizzolatti, one of the founders of mirror neurons, “They . . . allow us to grasp the minds of others not through conceptual reasoning but through direct stimulation; *by feeling, not by thinking.*”⁴⁸

In short, the mirror neurons fire in order to make us feel as if we were actually performing the actions we are merely witnessing. The firing of these neurons is then transmitted through a part of the brain called the insula, which then carries these signals to the brain’s limbic system.⁴⁹ The

41. GEORGE LAKOFF, THE POLITICAL MIND: WHY YOU CAN’T UNDERSTAND 21ST-CENTURY POLITICS WITH AN 18TH-CENTURY BRAIN 39 (2008).

42. *Id.* at 39-40.

43. DAMASIO, *supra* note 7, at 29.

44. IACOBONI, *supra* note 6, at 10-12.

45. *Id.* at 12.

46. *Id.* at 112, 114.

47. *See id.* at 111-12.

48. JONAH LEHRER, HOW WE DECIDE 185 (2009) (emphasis added).

49. IACOBONI, *supra* note 6, at 117.

limbic system is the brain center where we feel emotion.⁵⁰ Ideally, you are now able to feel exactly what the stranger feels. You are now able to determine whether he is a friend or foe.⁵¹

To put it another way, *the ability to empathize is necessary for survival*. Even though this is very recent brain research, in some ways we have always been aware of this. Almost sixty years ago, Richard Rodgers and Oscar Hammerstein wrote the song “I Whistle a Happy Tune” for their musical *The King and I*.⁵² It offers this advice on how to handle fear:

*Whenever I feel afraid,
I hold my head erect
And whistle a happy tune,
So no one will suspect
I'm afraid...*

*The result of this deception
Is very strange to tell,
For when I fool the people I fear,
I fool myself as well!*⁵³

Thus, Rodgers and Hammerstein in 1951 intuited that if you simply do something a brave person would do, it would actually make you feel brave yourself.⁵⁴ Similarly, William Shakespeare wrote: “Assume a virtue, if you have it not . . . [f]or use almost can change the stamp of nature.”⁵⁵ Neuroscience is now proving what mankind has long intuited.

We can relate this to the age-old debate between the roles of reason and emotion in human decision-making.⁵⁶ During Sonia Sotomayor’s Supreme

50. *Id.* at 112, 118-19.

51. *Id.* at 112, 116-21.

52. OSCAR HAMMERSTEIN II, *THE COMPLETE LYRICS OF OSCAR HAMMERSTEIN II* 347 (2008).

53. *Id.*

54. A recent study provides a darker example. Psychologists Francesca Gino, Michael Norton, and Dan Ariely passed out sunglasses to young women from boxes clearly marked either “authentic” or “counterfeit.” The women were then placed in a situation where it would be easy to lie to receive more money. Thirty percent of those who knew they were wearing the “authentic” lied, as opposed to seventy-one percent who lied while wearing the “counterfeit.” Gino’s conclusion was that “[w]hen one feels like a fake, he or she is likely to behave like a fake.” Marina Krakovsky, *The Counterfeit Self*, N.Y. TIMES MAG., Dec. 13, 2009, at 32.

55. WILLIAM SHAKESPEARE, *HAMLET PRINCE OF DENMARK* 108 (George Pierce Baker ed., 1913).

56. See DAMASIO, *supra* note 7, at 249-51.

Court confirmation hearings last summer, much ink was spilled on whether empathy should have any place in judging.⁵⁷ Neuroscience indicates that the issue is not *whether* empathy has a role in judging, but rather how significant a role it plays in decision-making.

Historically, philosophers from Plato to Descartes insisted that “reason” and “emotion” carried on a war inside the human mind.⁵⁸ To reach a proper decision, it was imperative that “reason” rein in unruly, irrational “emotion.”⁵⁹ As we learned more about the structure of the brain, this model evolved. The orbito-frontal cortex (“OFC”) was discovered to be the site of reason, while emotion was centered in the limbic system.⁶⁰ In neurological terms, proper decision-making became viewed as the result of the OFC dominating the limbic system.⁶¹ Such an insistence on reason controlling emotion could be called the “Mr. Spock” model of decision-making.

Today, however, neuroscientists believe this model to be simply wrong.⁶² The OFC does not *protect* us from emotions; rather, the OFC takes emotions and feelings found in the limbic system and then integrates them into the reasoning process.⁶³

Scientists learned this from observing people who had undergone brain operations that deprived them of emotions but left the reasoning parts of their brains intact.⁶⁴ The old theory would have predicted that the individuals’ decision-making would be improved due to the loss of emotion. Yet rather than making better decisions through pure reason, neuroscientists observed that these people became *incapable* of making even the simplest decisions.⁶⁵ This occurred because the part of the brain responsible for reasoning is not as evolved as the part of the brain responsible for emotions, which has been evolving for several hundred million years.⁶⁶ Being better developed, the emotional part of the brain is

57. See, e.g., Thomas Sowell, “Empathy” Versus Law: On Barack Obama’s Vision of America and the Supreme Court, ST. PAUL PIONEER PRESS, May 7, 2009, available at http://www.jewishworldreview.com/cols/sowell_050609.php3.

58. See DAMASIO, *supra* note 7, at 249-51.

59. See *id.*; LEHRER, *supra* note 48, at 26.

60. LEHRER, *supra* note 48, at 17.

61. *Id.*

62. *Id.*

63. *Id.* at 23, 25-27.

64. See DAMASIO, *supra* note 7, at 34-51 (describing the “Elliot” case); LEHRER, *supra* note 48, at 13-17 (describing the “Elliot” case).

65. See DAMASIO, *supra* note 7, at 34-51 (describing the “Elliot” case); LEHRER, *supra* note 48, at 13-17 (describing the “Elliot” case).

66. LEHRER, *supra* note 48, at 23-25.

so efficient that it works automatically without the person being aware of its processes.⁶⁷ For this reason, neuroscientists have estimated that anywhere from ninety-five to ninety-eight percent of what the brain does in reaching decisions lies outside our consciousness.⁶⁸ As Jonah Lehrer stated, “The process of thinking *requires* feeling, for feelings are what let us understand all the information that we can’t directly comprehend. *Reason without emotion is impotent.*”⁶⁹

Applying these insights to legal reasoning sheds light on the decision-making of judges as well as juries. There is an abundance of recent literature that examines ideological biases in judicial decision-making. It is most starkly illustrated by the title of Cass Sunstein’s recent book, *Are Judges Political?*,⁷⁰ as well as by Richard Posner’s Foreword for the 2004 Supreme Court Term in the Harvard Law Review, simply entitled *A Political Court*.⁷¹ Yet as brain research shows,⁷² judges could not avoid applying political values even if they tried.

Ward Farnsworth provided a fascinating example of this in his study of patterns in the U.S. Supreme Court’s criminal law decisions.⁷³ He compared decisions in two kinds of non-unanimously decided criminal cases: those involving constitutional issues and those involving non-constitutional issues (such as statutory construction).⁷⁴ Considering the variety of theories used in interpreting the Constitution—e.g. originalism, textualism, and minimalism—he posited that there should be no necessary correlation between a justice’s decisions in these two very different types of criminal cases.⁷⁵ Instead, he found a substantial degree of congruence.⁷⁶ Justices tended to be either pro-prosecution or pro-defense regardless of the kind of issue in the criminal case.⁷⁷ Farnsworth then posited that a justice’s decisions were not theory-driven, but rather based on a justice’s “priors”;

67. *Id.*

68. MICHAEL S. GAZZANIGA, *THE MIND’S PAST* 21 (1998).

69. LEHRER, *supra* note 48, at 26 (emphasis added).

70. CASS R. SUNSTEIN ET AL., *ARE JUDGES POLITICAL? AN EMPIRICAL ANALYSIS OF THE FEDERAL JUDICIARY* (2006).

71. Richard A. Posner, *The Supreme Court, 2004 Term—Foreword: A Political Court*, 119 HARV. L. REV. 32, 34 (2005).

72. *See supra* text accompanying notes 63-69.

73. *See* Ward Farnsworth, *Signatures of Ideology: The Case of the Supreme Court’s Criminal Docket*, 104 MICH. L. REV. 67, 67-68 (2005).

74. *Id.* at 68.

75. *Id.* at 74.

76. *Id.* at 70-71.

77. *Id.*

that is, the policy preferences, values, and empirical views that a justice possesses.⁷⁸

The power of a justice's "priors" can be seen by examining a series of eight cases decided by the U.S. Supreme Court during its 2006 term.⁷⁹ The cases were diverse in many ways. Some came to the Court through direct appeal, while others came through *habeas corpus* petitions.⁸⁰ The range of issues was also broad; issues included the propriety of jury instructions, the competence of the defendant, ineffective assistance of counsel, and the improper removal of a juror.⁸¹

What the cases had in common was that all eight were death penalty cases.⁸² In all eight cases, eight of the nine Justices voted for either the prosecution or defense *in every single case*.⁸³ Regardless of the issue, Chief Justice Roberts and Justices Scalia, Thomas, and Alito always voted in favor of the death penalty.⁸⁴ Regardless of the issue, Justices Stevens, Souter, Breyer, and Ginsburg always voted against the imposition of the death penalty.⁸⁵ Whatever the legal issue may have been, the decision for

78. *Id.* at 91-92.

79. See Timothy P. O'Neill, "The Stepford Justices": *The Need for Experiential Diversity on the Roberts Court*, 60 OKLA. L. REV. 701, 713-14 (2007).

80. *Id.*

81. *Id.*

82. *Id.* at 714.

83. *Id.*

84. *Id.*; see *Abdul-Kabir v. Quarterman*, 550 U.S. 233 (2007) (Roberts, C.J., Alito, Scalia & Thomas, JJ., dissenting); *Brewer v. Quarterman*, 550 U.S. 286 (2007) (Roberts, C.J., Alito, Scalia & Thomas, JJ., dissenting); *Lawrence v. Florida*, 549 U.S. 327 (2007) (Justice Thomas delivered the opinion of the Court denying petitioner's habeas petition, in which Chief Justice Roberts and Justices Alito and Scalia joined); *Panetti v. Quarterman*, 551 U.S. 930 (2007) (Roberts, C.J., Alito, Scalia & Thomas, JJ., dissenting); *Schriro v. Landrigan*, 550 U.S. 465 (2007) (Chief Justice Roberts and Justices Alito, Scalia, and Thomas joined in the opinion of the Court, which denied petitioner's habeas petition); *Smith v. Texas*, 550 U.S. 297 (2007) (Roberts, C.J., and Alito, Scalia & Thomas, JJ., dissenting); *Uttecht v. Brown*, 551 U.S. 1 (2007) (Chief Justice Roberts and Justices Alito, Scalia, and Thomas joined the opinion of the Court, which denied petitioner's habeas petition); *Ayers v. Belmontes*, 549 U.S. 7 (2006) (Chief Justice Roberts and Justices Alito, Scalia, and Thomas joined the opinion of the Court, which upheld the death penalty).

85. O'Neill, *supra* note 79, at 714; see *Abdul-Kabir*, 550 U.S. 233 (Justice Stevens delivered the opinion of the Court, invalidating the imposition of the death penalty, in which Justices Breyer, Ginsburg, and Souter joined); *Brewer*, 550 U.S. 286 (Justice Stevens delivered the opinion of the Court, which invalidated the imposition of the death penalty, in which Justices Breyer, Ginsburg, and Souter joined); *Lawrence*, 549 U.S. 327 (Breyer, Ginsburg, Souter & Stevens, JJ., dissenting); *Panetti*, 551 U.S. 930 (Justices Breyer, Ginsburg, Souter, and Stevens joined the opinion of the Court, which invalidated the imposition of the death penalty); *Schriro*, 550 U.S. 465 (Breyer, Ginsburg, Souter & Stevens, JJ., dissenting); *Smith*, 550 U.S. 297 (Justices Breyer, Ginsburg, Souter, and Stevens joined the opinion of the Court, which invalidated the imposition of

these eight Justices always came down to whether or not the death penalty should be affirmed.

This is exactly the type of subliminal emotion that would be formed in the limbic system through the action of mirror neurons. Arguably, the real issue in each of these eight cases was whether the Justices viscerally related to the murder victim or to the murder defendant on Death Row. Whose pain did the Justices feel? Whose experience did the Justices mirror? And because ninety-five to ninety-eight percent of reasoning is unconscious,⁸⁶ each Justice may have been unaware of what was actually driving his or her decision in any particular case.

Something similar may occur with jurors. To understand this, look at what is commonly regarded as the first jury trial in Western civilization: the trial of Orestes for the murder of his mother, Clytemnestra.⁸⁷ The background of the crime was complex and deserves some explanation. When King Agamemnon led the Greeks to Troy during the Trojan War, he left his wife, Clytemnestra, at home.⁸⁸ To win favor with the gods, Agamemnon sacrificed their daughter, Iphigenia.⁸⁹ Furious at her husband, Clytemnestra took a lover.⁹⁰ When Agamemnon returned from the war, Clytemnestra and her lover killed Agamemnon.⁹¹ Orestes, the son of Agamemnon and Clytemnestra, subsequently avenged his father's murder by killing both his mother and her lover.⁹²

Orestes was tried for matricide before a jury of twelve Athenians, with the goddess Athena serving as judge.⁹³ The prosecution, led by the Furies, argued that it was a clear case of matricide.⁹⁴ Orestes, however, responded that he had to act to avenge his mother's murder of his father.⁹⁵ The Furies, in turn, asserted that Clytemnestra was properly avenging the murder of her daughter Iphigenia.⁹⁶

the death penalty); *Uttecht*, 551 U.S. 1 (Breyer, Ginsburg, Souter & Stevens, JJ., dissenting); *Ayers*, 549 U.S. 7 (Breyer, Ginsburg, Souter & Stevens, JJ., dissenting).

86. GAZZANIGA, *supra* note 68, at 21.

87. See N.S. Gill, *The House of Atreus—Greek Tragedy*, ABOUT.COM, <http://ancienthistory.about.com/od/houseofatreus/a/houseofatreus.htm> (last visited Feb. 18, 2010).

88. *Id.*

89. *Id.*

90. *Id.*

91. *Id.*

92. *Id.*

93. Gill, *supra* note 87.

94. *Id.*

95. *Id.*

96. *Id.*

Faced with these complexities, the jury of twelve was split six-to-six.⁹⁷ Athena, as judge, cast the tie-breaking vote.⁹⁸ She voted for acquittal, providing us with the earliest murder verdict by jury in Western culture.⁹⁹

Athena's reasons for acquittal are particularly significant. Athena was not born of a mother; she had sprung full-grown from the head of her father, Zeus.¹⁰⁰ In light of this, consider Athena's reasons for her verdict, expressed in Aeschylus' play *The Eumenides*:

*It is my task to render final judgment here.
This is a ballot for Orestes I shall cast.
There is no mother anywhere who gave me birth,
and, but for marriage, I am always for the male
with all my heart, and strongly on my father's side.
So, in a case where the wife has killed her husband, lord
of the house, her death shall not mean most to me. And if
the other votes are even, then Orestes wins.*¹⁰¹

In other words, in today's terminology, Athena lacked the wiring in her brain to enable her to empathize with a mother. Her bond with her only parent, Zeus, enabled her to empathize solely with Orestes as he avenged the death of his father. Perhaps we can see the role of mirror neurons in the verdict of Western literature's first recorded jury trial in 458 B.C.E.¹⁰²

One modern trial technique stands out as a prime example of how empathy and mirror neurons can be used to influence a jury. This technique is known as "channeling."¹⁰³ An example of "channeling" can be found in the recent Montana Supreme Court decision, *Heidt v. Argani*.¹⁰⁴

In *Heidt*, a wife alleged that her husband's death was caused by the medical malpractice of the defendant doctor.¹⁰⁵ Most of the plaintiff's closing argument was delivered as a first-person narrative by the plaintiff's

97. *Id.*

98. *Id.*

99. Gill, *supra* note 87.

100. See Greek-Gods.Info, Olympian Gods, Athena, the Goddess of Wisdom, <http://www.greek-gods.info/greek-gods/athena/> (last visited Feb. 18, 2010).

101. Aeschylus, *The Eumenides*, in 3 GREEK TRAGEDIES 31 (David Grene & Richmond Lattimore eds., 2d ed. 1991).

102. See Gill, *supra* note 87.

103. See *Heidt v. Argani*, 214 P.3d 1255, 1257 (Mont. 2009). I am indebted to Professor Susann MacLachlan for bringing this case to my attention.

104. 214 P.3d 1255.

105. *Id.* at 1256.

attorney who assumed the persona of the dead husband in order to recount the events leading up to his death.¹⁰⁶ The attorney used phrases such as, “Oh my God, I’m dying.”¹⁰⁷ He then described what it was like being autopsied, including a description of being cut open.¹⁰⁸ He then spoke of his sorrow at not being able to see his children grow up.¹⁰⁹ The attorney described this trial technique as “channeling” the deceased.¹¹⁰

In light of mirror neuron theory, it is easy to see how this could be an effective device. As the attorney pretended to be the deceased, mirror neurons in the jurors’ brains would be activated, enabling them to virtually experience the pain and trauma the deceased allegedly suffered. “Channeling” is a trial tool that has been associated with well-known attorneys such as Gerry Spence,¹¹¹ Geoffrey Fieger,¹¹² and John Edwards.¹¹³ But from what we are learning about the brain, it is more than a mere rhetorical device; it could also have a powerful neurobiological effect.

How powerful? Powerful enough that “channeling” was even criticized by Plato.¹¹⁴ In Book Three of *The Republic*, Plato argued that the State should ban what he called the “imitative poet.”¹¹⁵ Plato had no problem with the “narrative poet” who, for example, would tell the story of Achilles from a third-party perspective.¹¹⁶ But he rejected the “imitative poet” who told the story by actually pretending to be Achilles.¹¹⁷ Plato’s concern was that this kind of poet both misrepresented the truth and made a strong appeal to the emotional, rather than the rational, side of man.¹¹⁸ According to Plato, the “imitative poet” encouraged both falsity and

106. *Id.* at 1257.

107. *Id.*

108. *Id.*

109. *Heidt*, 214 P.3d at 1257.

110. *Id.*

111. See Posting of Peter Tillers to Tillers on Evidence and Inference, http://tillerstillers.blogspot.com/2009/08/sickening-closing-argument_21.html (Aug. 21, 2009, 4:34 PST).

112. See *McLeod v. Mt. Sinai Med. Ctr.*, 852 N.E.2d 1235, 1259-62 (Ohio Ct. App. 2006) (describing Fieger’s closing argument in a medical malpractice case where he pretended he was the baby who died during delivery).

113. See Adam Liptak & Michael Moss, *In Trial Work, Edwards Left a Trademark*, N.Y. TIMES, Jan. 31, 2004, at A1 (describing John Edwards’s use of “channeling” during closing argument of a medical malpractice case).

114. See Plato, *The Republic*, in *THE REPUBLIC AND OTHER WORKS* 80-86 (B. Jowett trans., 1973).

115. See *id.* at 81, 85-86.

116. See *id.* at 80, 84.

117. See *id.* at 84.

118. See *id.* at 83-84.

irrationality.¹¹⁹ Thus, despite the fact that Plato enjoyed these performers, he would nonetheless ban the “imitative poet” from the State.¹²⁰ By discussing this tendency for the listeners to feel what the “imitative poet” was pretending to feel, Plato appears to have anticipated mirror neurons by about 2300 years.

Was Plato exaggerating the effects? To answer this, look at the impact “channeling” had on the jury in the *Heidt* case. In the words of the Montana Supreme Court, the effects caused by the channeling technique “got to be more than some [jurors] could bear.”¹²¹ One juror said she was “not okay” and thought she would pass out.¹²² She then began to leave the jury box.¹²³ The court called a recess, and the ill juror was actually treated by the defendant doctor.¹²⁴ The Montana Supreme Court reversed, reasoning that because of the defendant’s medical treatment of the juror, the trial court should have granted a mistrial.¹²⁵

Unfortunately, the court had nothing to say about the propriety of using a technique such as “channeling” at trial. The revolution in neuroscience will compel courts in the future to confront a variety of techniques—not simply “channeling,” but victim impact statements and “day in the life” videos—in light of what is being discovered about empathy and mirror neurons.

American courts still look at “reason” and “emotion” the same way Descartes did centuries ago: separate entities in our brain at war with each other.¹²⁶ It is time for the legal system to begin using modern neuroscience to analyze whether certain trial techniques that influence juries are prejudicial enough to be limited, or even banned. It is time for judges to better understand how they make decisions. Finally, it is time for the legal system as a whole to begin to understand how neurological discoveries such as mirror neurons may impact the future of American law.

119. *See id.*

120. *See Plato, supra* note 114, at 85-86.

121. *Heidt v. Argani*, 214 P.3d 1255, 1257 (Mont. 2009).

122. *Id.*

123. *Id.*

124. *Id.*

125. *Id.* at 1259.

126. *See DAMASIO, supra* note 7, at 249-50 (explaining Descartes’s conception of reason and emotion); *see, e.g., Monge v. California*, 524 U.S. 721, 732 (1998) (“It is of vital importance that the decisions made in that context ‘be, and appear to be, based on reason rather than caprice or emotion.’” (internal quotation marks omitted) (citing *Gardner v. Florida*, 430 U.S. 349, 358 (1977))).