

THE LAWYER'S LEFT HAND: NONANALYTICAL THOUGHT IN THE PRACTICE OF LAW

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Since childhood, I have been enchanted by the fact and the symbolism of the right hand and the left The right is order and lawfulness, le droit. Its beauties are those of geometry and taut implication. Reaching for knowledge with the right hand is science. . . . And should we say that reaching for knowledge with the left hand is art?¹

Of course, the law is not the place for the artist or the poet.²

INTRODUCTION

In the late nineteenth century, Christopher Columbus Langdell championed the notion that the law is a pure and exact science, consisting of principles which are discoverable through

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1. JEROME S. BRUNER, *ON KNOWING: ESSAYS FOR THE LEFT HAND* 2 (1979). The symbolism associated with the left and right, in general, and with the left and right hands, in particular, has been the subject of a literature that is surprisingly extensive. See, e.g., *LEFT AND RIGHT: ESSAYS ON DUAL SYMBOLIC CLASSIFICATIONS* (Rodney Needham ed., 1973); see also MICHAEL C. CORBALLIS & IVAN L. BEALE, *THE PSYCHOLOGY OF LEFT AND RIGHT* (1976). One line of symbolic associations links the left hand with *badness* and the right hand with *goodness*. See BETTY EDWARDS, *DRAWING ON THE RIGHT SIDE OF THE BRAIN* 33 (1979); see also John J. Sciortino, *Sinistral Legal Studies*, 44 SYRACUSE L. REV. 1103, 1115 (1993). A second and especially persistent line of associations, perhaps not altogether distinct from the first, has been characterized in this way: "More often than not the left hand has been associated with intuition and the artistic, while the right hand is more often associated with logic, order and reason." MARK BROWN, *LEFT HANDED: RIGHT HANDED* 95 (1979). It is upon this second line of symbolic associations that this article draws in its title and text.

2. OLIVER W. HOLMES, *The Profession of the Law*, in *COLLECTED LEGAL PAPERS* 29, 29 (1920).

analysis of the embedded logic of reported cases.³ This view of the law suggests a parallel view of the lawyer as a cool practitioner of legal science, whose task it is to discern and apply the principles of law "with constant facility and certainty to the ever-tangled skein of human affairs."⁴ It implies that in the broad terrain of the human mind, it is the Apollonian virtues⁵—reason, dispassionate analysis, formal logic—that are the special mental virtues of the lawyer.⁶ The creative imagination and the passion of the artist would have little place in the crystalline mind of Langdell's ideal lawyer, who would reach for knowledge, first and always, with the right hand.⁷

Although Langdell's concept of the law as an exact science has largely withered away,⁸ the correlated notion of the

3. See LAWRENCE M. FRIEDMAN, A HISTORY OF AMERICAN LAW 531-35 (1973).

4. C.C. LANGDELL, A SELECTION OF CASES ON THE LAW OF CONTRACTS at vi (1871)

5. Friedrich Nietzsche used the term "Apollonian" to describe one central principle in Greek culture and Greek tragedy, and contrasted it with an opposing principle he termed "Dionysiac." See WILLIAM R. BENET, THE READER'S ENCYCLOPEDIA 42 (2d ed. 1965). Nietzsche associated Pheobus Apollo, the Greek god of light, with form, structure, and rational thought; the Apollonian principle was for him "the basis of all analytic distinctions." *Id.*; see generally FRIEDRICH NIETZSCHE, THE BIRTH OF TRAGEDY FROM THE SPIRIT OF MUSIC (1872).

6. Michael Meltsner has suggested, in a similar vein, that the "notion that the best lawyering is the product of hard-boiled, hard-edged, tough-minded, impersonal, analytic thinking . . . ultimately derives from science and scientific method." Michael Meltsner, *Feeling Like a Lawyer*, 33 J. LEGAL EDUC. 624, 633 (1983). This is not to say that nonanalytical aspects of thought are not in fact highly valued commodities in science. See *infra* Part II.D. Quite the opposite is the case, as shown by the "warm praise that scientists lavish on those of their colleagues who earn the label 'intuitive.'" JEROME S. BRUNER, THE PROCESS OF EDUCATION 58, 67 (1960). Labeling the lawyer a practitioner of legal science, however, has less to do with science-in-fact than it does with science-in-symbol. As a symbol, the scientific method stands counterpoised to the method of art: "It has long been known that science is only one of the methods of studying the world around us. Another—complementary—method is realized in art The backbone of science is logic and experiment. The basis of art is intuition and insight." LEONID PONOMAREV, IN QUEST OF THE QUANTUM 244 (Nicholas Weinstein trans., 1973).

7. See *supra* note 1 and accompanying text.

8. It appears that the *coup de grace* came in the 1930s, delivered by the hand of the Legal Realist movement. See Stevens, *Two Cheers for 1870: The American Law School*, in 5 PERSPECTIVES IN AMERICAN HISTORY 405, 480-81 (Donald Fleming & Bernard Bailyn eds., 1971). The concept of law as science enjoyed so little support in the succeeding years that Ronald Dworkin could write in 1977 (of the related concept of "mechanical jurisprudence") that the difficulty in ridiculing its practitioners "lies in finding practitioners to ridicule." RONALD DWORKIN, TAKING RIGHTS SERIOUSLY 15 (1977). It has been more recently suggested, however, that mechanical jurisprudence has made a "remarkable comeback." See JAN AICHELE,

Apollonian lawyer enjoys a surprisingly robust good health. American law schools still teach predominantly through variants of the case method that Langdell popularized,⁹ and through that method focus principally upon the development of analytical thinking among their lawyers-in-training.¹⁰ Although the phrase "thinking like a lawyer" may be more talismanic than descriptive,¹¹ it is above all else associated with a logical, analytical style of thought.¹² Indeed, so firmly established is this association that brain researchers have selected lawyers when they wished to test an occupational group that is characteristically analytical in its preferred mode of thought.¹³ Moreover, to the extent that systematic empirical evidence on the subject exists, it appears to support, though in only a tentative way, the image of the American lawyer as *homo analyticus*.¹⁴

LEGAL REALISM AND TWENTIETH-CENTURY AMERICAN JURISPRUDENCE at x (1990).

9. See David O. Friedrichs, *Narrative Jurisprudence and Other Heresies: Legal Education at the Margin*, 40 J. LEGAL EDUC. 3, 3 (1990); Paul F. Teich, *Research on American Law Teaching: Is There a Case Against the Case System?*, 36 J. LEGAL EDUC. 167, 170 (1986); Joan C. Williams, *Critical Legal Studies: The Death of Transcendence and the Rise of the New Langdells*, 62 N.Y.U. L. REV. 429, 430 (1987).

10. See Paul J. Spiegelman, *Integrating Doctrine, Theory, and Practice in the Law School Curriculum: The Logic of Jake's Ladder in the Context of Amy's Web*, 38 J. LEGAL EDUC. 243, 249-53 (1988). The development of a "tough-minded" and analytical attitude toward legal tasks and professional roles" has been described as an "essential ingredient[] of the ordinary religion of the American law school classroom." Roger C. Crampton, *The Ordinary Religion of the Law School Classroom*, 29 J. LEGAL EDUC. 247, 248 (1978); see also Adrienne Drell, *Chilling Out*, A.B.A. J., Oct. 1994, at 70 ("Starting with the first day of law school, lawyers are taught to suspend emotion in favor of cold, legal analysis.").

11. See John O. Mudd, *Beyond Rationalism: Performance-Referenced Legal Education*, 36 J. LEGAL EDUC. 189, 194 (1986); John O. Mudd, *Thinking Critically About "Thinking Like a Lawyer,"* 33 J. LEGAL EDUC. 704, 704 (1983).

12. See Paul Bergman, *The War Between the States (Of Mind): Oral Versus Textual Reasoning*, 40 ARK. L. REV. 505, 505 (1987). The American Bar Association, in fact, has suggested that this style of thought is a central component of competence in the practice of law: "Competent professional judgment is the product of a trained familiarity with law and legal processes, a disciplined, analytical approach to legal problems, and a firm ethical commitment." MODEL CODE OF PROFESSIONAL RESPONSIBILITY EC 3-2 (1981).

13. See, e.g., Stephan Arndt & Dale E. Berger, *Cognitive Mode and Asymmetry in Cerebral Functioning*, 14 CORTEX 78, 82-84 (1978) (describing an experiment which tested the cognitive modes and hemispheric reaction times of lawyers and sculptors); Robert E. Ornstein, *The Split and the Whole Brain*, HUMAN NATURE, May 1978, at 76, 78 (describing an experiment which compared the hemispheric brain wave activity of lawyers and ceramic artists).

14. The limited evidence that is available is suggestive but hardly conclusive. In one unpublished study, a brain-dominance testing instrument was distributed to a group of 100 Chicago lawyers who were partners in large firms. Of the 29 lawyers

There have, however, been calls from within the legal academy, once the temple of legal rationalism, for an appreciation of the importance of nonanalytical mental processes in the tasks of the lawyer.¹⁵ These calls reflect a growing awareness that the creative lawyer must draw upon the mental processes of the artist, as well as those of the scientist, and that the time is

who responded, 87% were rated as "left-brain dominant," indicating a preference for analytical strategies of thought. See Cynthia Kelly & Bernice McCarthy, Presentation at the Annual Meeting of the Association of American Law Schools (Jan. 4, 1985) (audiotape available through the AALS). A separate study drew upon a large, preexisting data pool which included a sample of 1874 recent male law graduates and 271 practicing lawyers, also primarily males, who had been administered the Myers-Briggs Type Indicator. The results indicated that 74.76% of the recent law graduates and 64.94% of the lawyers preferred "thinking" to "feeling" as a way of exercising judgment. See GERALD P. MACDAID ET AL., MYERS-BRIGGS TYPE INDICATOR ATLAS OF TYPE TABLES 311-12 tbls. 8623162 & 8629439 (1986). "Thinking" in the Myers-Briggs terminology, which is based on Carl Jung's theory of type, refers to a process of impersonal, logical analysis. See ISABEL B. MYERS, MANUAL: THE MYERS-BRIGGS TYPE INDICATOR 52, 56 (1962). One stark limitation of the value of this data is its overreliance on males as subjects of study, given the possibility that the characteristic thought processes of men and women may differ in important respects. See Carrie Menkel-Meadow, *Portia in a Different Voice: Speculations on a Woman's Lawyering Process*, 1 BERKELEY WOMEN'S L.J. 39, 40 (1985).

15. An early voice calling attention to the importance of nonanalytical thought in the legal process, and in legal education, was that of Kenneth Karst. "Lawyers who lack analytical ability, of course, are useless," he wrote in 1979, "[b]ut lawyers who are too devoted to deductive, analytical thinking are a menace . . ." Kenneth L. Karst, *Law and the Ways of Knowing*, OHIO ST. UNIV. L. REC., 1978-79, at 1, 2. Since then, others in the law school community have questioned the sufficiency of a narrow focus upon analytical skills in the training of lawyers and in the practice of law. Langdell's eventual successor as Dean of the Harvard Law School, Derek Bok, for example, has written that "one can admire the virtues of careful analysis and still believe that the times cry out for more than these traditional skills." Derek C. Bok, Report to the Harvard Board of Overseers for 1981-82, reprinted in *A Flawed System of Law Practice and Training*, 33 J. LEGAL EDUC. 570, 582 (1983); see also DAVID A. BINDER & PAUL BERGMAN, FACT INVESTIGATION: FROM HYPOTHESIS TO PROOF 174 (1984) (encouraging lawyers to welcome intuition as a neglected method of formulating factual hypotheses); Bergman, *supra* note 12, at 544 (suggesting that lawyers, although specializing in logic, need to retain the influence of emotion and intuition); Beryl Blaustone, *To Be of Service: The Lawyer's Aware Use of the Human Skills Associated with the Perceptive Self*, 15 J. LEGAL PROF. 241, 247 (1990) ("Understanding the law requires more than the use of rational analysis."); Emily Calhoun, *Thinking Like a Lawyer*, 34 J. LEGAL EDUC. 507, 510 (1984) ("Intuition, that progenitor of new inferential frameworks, is rarely identified or exploited as an invaluable component of legal analysis. . . . Were intuition ceded its rightful place as an important component of thinking like a lawyer . . . a new dimension would be added to legal education."); Meltsner, *supra* note 6, at 633 ("[A] method of training lawyers which ignores the intuitive, the emotive, and the personal belongs not to the history of science but to the history of pseudoscience.").

overdue for significant movement beyond a single-minded focus upon reason, logic, and analysis in legal education and in the practice of law. "Perhaps," to put the matter in the graceful words of Jerome Bruner, "the moment is uniquely propitious for the left hand".¹⁶ a hand awkward at many tasks but which may be especially well suited to others;¹⁷ the hand of art, intuition, and imagination;¹⁸ the lawyer's forgotten hand.

The left hand and the whole of the left side of the human body are ordinarily controlled by the right hemisphere of the brain while the right side is ordinarily controlled by the brain's left hemisphere.¹⁹ There is, as we shall see, an inexact but suggestive crisscross correlation between the symbolism historically associated with the left and right hands, and the distinct styles of thought that have been linked, more recently, with the right and left cerebral hemispheres of the human brain.²⁰ Thus, the intriguing possibility exists that symbolism may mirror a more fundamental reality, and that the historical division between the thought processes associated with science, on the one hand, and art, on the other, may be reflected in some degree in the organic structure of the human brain.

This article explores the neglected role of the left hand, used here as a symbol for nonanalytical processes of thought, in the practice of law. It suggests that although analysis is an exceed-

16. BRUNER, *supra* note 1, at 8.

17. *See id.* at 2. Bruner reports, for example, that "it has been proposed that art students can seduce their proper hand to more expressiveness by drawing first with the left." *Id.* *But cf.* EDWARDS, *supra* note 1, at 43 (noting that drawing with the left hand by a right-hander does not seem to help the drawer to tap into right-brain processes).

18. *See supra* note 1 and accompanying text. Although the relationship of the left hand to creative artistry is primarily a symbolic one, there is empirical evidence to suggest that the incidence of left-handedness (and of mixed-handedness) is in fact significantly higher among artists than it is among the population at large. *See* SALLY P. SPRINGER & GEORG DEUTSCH, *LEFT BRAIN, RIGHT BRAIN* 142 (1993).

19. *See* SPRINGER & DEUTSCH, *supra* note 18, at 2. This general proposition is, however, subject to qualification. Most human brains do display a predominant pattern of crossed neurological wiring from each hemisphere to the opposite, or contralateral, side of the body. *See* MARIAN ANNETT, *LEFT, RIGHT, HAND AND BRAIN: THE RIGHT SHIFT THEORY* 27 (1985). There are also, however, some nerve connections between each hemisphere and the *same* side of the body, and many connections between the hemispheres, that permit some control by each hemisphere over ipsilateral (same-side) functions of the body. *See id.* at 20, 23.

20. *See* BROWN, *supra* note 1 ("There appears to be some relationship between the symbolism of the left hand and the function of the right brain, and between the symbolism of the right hand and the functions of the left brain."); *infra* Part I.

ingly important tool of legal thought, it is not the mental strategy best suited to some of the most important tasks of the lawyer. Part I offers a guided tour of the bicameral human mind. It describes two distinct methods of processing information—one analytical in nature, and one nonanalytical in nature—that evidence from the laboratory has suggested are characteristic of the two cerebral hemispheres of the brain. Part II explores the range and power of “left-handed,” nonanalytical thought processes in the practice of law. It concludes that the lawyer’s left hand plays a surprisingly important role in the work of the lawyer, especially in the perception and discrimination of emotion; in receiving and conveying information in the form of a narrative; and in the creative generation of factual hypotheses in the everyday practice of law.

I. OF TWO MINDS

*The intellect is an organ composed of several groups of functions, divisible into two important classes, the functions and faculties of the right hand, [and] the functions and faculties of the left.*²¹

It was known even in the time of Hippocrates that the human brain is a double organ,²² divided left and right into two deeply creviced hemispheres. The hemispheres are joined by a massive band of nerve fiber, the corpus callosum,²³ and together resemble nothing quite so much as an oversized, shelled walnut.²⁴ Because the hemispheres are very nearly mirror images in size and shape,²⁵ it was quite natural for early investigators to assume

21. Sri Aurobindo, *The Powers of the Mind*, in SRI AUROBINDO CENTENARY LIBRARY, A SYSTEM OF NATIONAL EDUCATION 17, 207 (1972), quoted in J.E. Bogen, *Some Educational Aspects of Hemispheric Specialization*, UCLA EDUCATOR, Spring 1975, at 24. The author is described as a “yogic philosopher” who wrote the quoted lines in 1910. See *id.* Aurobindo described the faculties of the *right* hand as “comprehensive, creative and synthetic,” and the faculties of the *left* hand as “critical and analytic” (reversing the usual association of hands to mental functions, but showing a certain prescience in his definition of the bilateral functions of the mind). See *id.*

22. See THE MEDICAL WORKS OF HIPPOCRATES 183 (John Chadwick & W.N. Mann trans., 1950).

23. See ALAN BEATON, LEFT SIDE, RIGHT SIDE: A REVIEW OF LATERALITY RESEARCH 35 (1986).

24. The image is borrowed from EDWARDS, *supra* note 1, at 26.

25. Modern research has, however, exposed a number of subtle physical

that, as in the case of other duplicated organs, their similarity of form was matched by a similarity of function.²⁶ Over the course of the last century and a half, however, there has been accumulating evidence, at first suggestive, then compelling, and finally unequivocal, that the hemispheres of the human brain are strikingly different in function.²⁷

The first suggestions of the functional asymmetry of the human brain were based upon the clinical observation that the loss of coherent speech, a condition now called "aphasia," is often associated with signs of physical damage to the left hemisphere of the brain. That observation was reported and ignored as early as 1836.²⁸ It was reported again twenty-five years later, and in a manner more difficult to ignore, when French neurologist Paul Broca audaciously displayed a human brain at a meeting of the Society of Anthropology in Paris.²⁹ It was the brain of a former patient who had suffered from a speech disorder,³⁰ and it showed a clear lesion in the left hemisphere.³¹

In the years that followed, Broca documented additional cases of correlation between speech disruption and left-brain

differences between the hemispheres which appear to represent an "anatomical counterpart" to earlier discovered functional distinctions. See Jeffrey L. Cummings, *Hemispheric Asymmetries in Visual-Perceptual and Visual-Spatial Function* [sic], in *THE DUAL BRAIN: HEMISPHERIC SPECIALIZATION IN HUMANS* 233, 233-35 (D. Frank Benson & Eran Zaidel eds., 1985) [hereinafter *THE DUAL BRAIN*]; Sandra F. Witelson, *Bumps on the Brain: Right-Left Anatomic Asymmetry as a Key to Functional Lateralization*, in *LANGUAGE FUNCTIONS AND BRAIN ORGANIZATION* 117, 133 (Sydney J. Segalowitz ed., 1983).

26. See HOWARD GARDNER, *THE SHATTERED MIND* 350 (1976). The eyes, ears, lungs, and kidneys, for example, are both physiologically and functionally symmetrical.

27. See Joseph E. Bogen, *The Dual Brain: Some Historical and Methodological Aspects*, in *THE DUAL BRAIN*, *supra* note 25, at 27, 32 ("It is [the] convergence on a common conclusion through a variety of different approaches that has given us a near-certainty in our conviction of complementary hemispheric specialization in the human.").

28. In that year Marc Dax delivered a paper reporting that in more than forty patients suffering from speech impairment he had observed signs of damage to the left hemisphere of the brain, and that he had never encountered a similar case in which the damage was to the right hemisphere alone. See SPRINGER & DEUTSCH, *supra* note 18, at 1-2.

29. See *id.* at 9.

30. The patient was nicknamed Tan because his vocabulary for the last years of his life was limited to the repetition of the sounds "tan tan." See JOHN L. BRADSHAW & NORMAN C. NETTLETON, *HUMAN CEREBRAL ASYMMETRY* 36 (1983).

31. See SPRINGER & DEUTSCH, *supra* note 18, at 9-10. The damage was to a region that has come to be known as "Broca's area." See *id.*

damage, as well as cases in which similar right-brain damage was not accompanied by any disruption of the faculty of speech.³² In 1865, he summarized his findings in a single phrase in which was compressed the early universe of knowledge concerning hemispheric specialization: "nous parlons avec l'hémisphère gauche."³³

Nearly a century would pass before that universe would expand dramatically in an explosion of research interest sparked by the "split-brain" studies of Nobel Laureate Roger Sperry and his colleagues at the California Institute of Technology.³⁴ Those studies, testing a group of patients whose cerebral hemispheres had been surgically severed,³⁵ employed imaginative procedures to compare the capacities of each hemisphere functioning in isolation.³⁶ They firmly demonstrated, often in surprising³⁷ and sometimes in astonishing³⁸ ways, a set of functional distinctions

32. *See id.* at 10-11.

33. "We speak with the left hemisphere." Paul Broca, *Sur la Faculté du Langage Articulé*, 6 BULLETIN DE LA SOCIÉTÉ D'ANTHROPOLOGIE 337 (1865), quoted in YVES JOANETTE ET AL., RIGHT HEMISPHERE AND VERBAL COMMUNICATION 2 (1990). The evidence from Broca and others that the brain's left hemisphere is ordinarily preeminent in verbal functions contributed to a broader notion, largely unchallenged until the mid-twentieth century, that the left hemisphere is preeminent in all important psychological functions. *See* BEATON, *supra* note 23, at 2.

34. For an insider's review of the early years of split-brain research, see MICHAEL S. GAZZANIGA, THE SOCIAL BRAIN 27-46 (1985).

35. The procedure is known as a "commissurotomy," and was performed for the purpose of controlling the spread of epileptic seizures between the hemispheres of the brain. *See* Michael S. Gazzaniga, *Review of the Split Brain*, UCLA EDUCATOR, Spring 1975, at 9, 10.

36. *See* SPRINGER & DEUTSCH, *supra* note 18, at 33-37.

37. This example illustrates both the surprising results and the clever technique of an early split-brain experiment:

In one test, two different pictures were flashed for an instant on a screen, with a split-brain patient's eyes fixed on a midpoint so that scanning both images was prevented. Each hemisphere, then, received *different* pictures. A picture of a spoon on the left side of the screen went to the right brain; a picture of a knife on the right side of the screen went to the verbal left brain When questioned, the patient gave *different responses*. If asked to *name* what had been flashed on the screen, the confidently articulate left hemisphere caused the patient to say, "knife." Then the patient was asked to reach behind a curtain with his left hand (right hemisphere) and pick out what had been flashed on the screen. The patient then picked out a spoon from a group of objects that included a spoon and a knife.

EDWARDS, *supra* note 1, at 30-31.

38. Consider, for example, this firsthand account of an early demonstration of hemispheric asymmetries in dealing with a spatial task:

I placed a simple pattern on a card in full view on a white tablecloth, . . . and I then placed next to the pattern the four blocks that had to be arranged to match the pattern. I let W.J.'s [the split-brain patient's] left hand go first, the one that gets its major control from the right brain.

between the isolated hemispheres of the divided human brain.³⁹ Sperry's groundbreaking work prompted a host of additional research projects, numbering literally in the thousands,⁴⁰ which combined have established the fundamental fact of hemispheric specialization not only in brain-damaged and split-brain patients, but also in the normal individual with a fully intact brain.⁴¹

Researchers have differed to some degree in their interpretation of the laboratory findings regarding the functional distinctions between the hemispheres, and have differed still more in the labels with which they have characterized those distinctions.⁴² Some characterizations, particularly within the derivative popular literature, have gone well beyond the evidence of the laboratory into more broadly speculative territory, and have led to charges of the "overdichotomization" of brain functions,⁴³ and even of "dichotomania."⁴⁴ The enormous body of published

Swiftly and easily the blocks were correctly arranged. I then picked the blocks up, mixed them up, and placed them back on the table. W.J.'s task was now to do the same chore with his dominant right hand. This hand receives its major innervation from the left, talking brain. We ran out of film as we watched him struggle with the task. At several instances during the filming, the left hand tried to intervene and help the incompetent right hand. That side of his body knew how to do this task. His failure was riveting and completely convincing.

[Then] I told W.J. he could use either hand. It was the first time I saw how the two mental systems could get into a struggle of major proportions. The left hand would make progress at solving the task and then the right would come in and undo the left's superior accomplishments. It was as if they were in a duel

GAZZANIGA, *supra* note 34, at 49-51.

39. See R.W. Sperry, *Lateral Specialization in the Surgically Separated Hemispheres*, in *THE NEUROSCIENCES: THIRD STUDY PROGRAM 5* (Francis O. Schmitt & Frederic G. Worden eds., 1974).

40. See Ornstein, *supra* note 13, at 79.

41. See BRADSHAW & NETTLETON, *supra* note 30, at 82; SPRINGER & DEUTSCH, *supra* note 18, at 272; see also M.P. BRYDEN, *LATERALITY: FUNCTIONAL ASYMMETRY IN THE INTACT BRAIN* (1982). But see ROBERT EFRON, *THE DECLINE AND FALL OF HEMISPHERIC SPECIALIZATION* 65 (1990) (offering an alternative explanation for left/right performance asymmetries). The extension of research to normal subjects was a crucial confirmation of the implications of the split-brain studies, because all the split-brain patients had preexisting areas of brain damage which theoretically could have influenced the results. Indeed, these prior lesions caused the seizures which the split-brain operation was designed to control. See Bogen, *supra* note 27, at 30.

42. See, e.g., GAZZANIGA, *supra* note 34, at 52-53.

43. See MICHAEL C. CORBALLIS, *HUMAN LATERALITY* 8 (1983).

44. See BRYDEN, *supra* note 41, at 107; SPRINGER & DEUTSCH, *supra* note 18, at 274; see also, e.g., GAZZANIGA, *supra* note 34, at 47-59 (a chapter entitled "Left-Brain, Right-Brain Mania: A Debunking"). Among the most remarkable of the exaggerated speculations regarding hemispheric function must be counted the published

research in the field has, nevertheless, provided a sturdy foundation for a limited number of well-documented generalizations concerning the nature of the lateralized specialization of the hemispheres in the typical⁴⁵ human brain.

The oldest and least assailable of the generalizations, supported by all branches of research over a period of more than a century and a half, is that the left hemisphere has a specialized capacity for (and the right hemisphere, a severe disability in) verbal functions.⁴⁶ Even this venerable distinction is, however, subject to qualification. This is so not only because there is a small percentage of the population in which expressive powers develop bilaterally or in the right hemisphere⁴⁷ but also because there appears to be a division of particular aspects of language-related functions between the left and right hemispheres even in the typically lateralized brain. It is an uneven division, clearly favoring the left.

The left hemisphere appears to provide the formal structure and solid backbone of language: it alone is the master of syntax (the structural rules of sentence formation), and it alone is adept at labeling objects and dealing with the literal definitions of words.⁴⁸ These powers join to give the left hemisphere a special

suggestion that improved cooperation between the right and left hemispheres could somehow influence the treatment of acne. See George Prince, *Putting the Other Half of the Brain to Work*, 15 TRAINING: THE MAGAZINE OF HUMAN RESOURCE DEVELOPMENT 57 (1978) (citing W.C. Ellerbroek, *Language, Thought, and Disease*, CO-EVOLUTION Q., Spring 1978, at 30).

45. There are atypical cases of reversed or mixed hemispheric specialization in a certain percentage of the population, particularly among left-handers. See ROBERT E. ORNSTEIN, *THE PSYCHOLOGY OF CONSCIOUSNESS* 91 (1972). Moreover, there appears to be a significant degree of plasticity in the brain, especially in the youthful brain, which may permit some reorganization of functions in response to localized damage to brain tissue. See SPRINGER & DEUTSCH, *supra* note 18, at 233-35.

46. See ANNETT, *supra* note 19, at 104 ("With regard to the left hemisphere, evidence from all sources confirms, and none gives reason to doubt, that for most people, speech and other language skills depend mainly on the left side."). The superior speed and accuracy of the left hemisphere in performing language tasks has been called "[t]he closest approximation extant to a rock-solid finding in the study of human cerebral lateralization." Curtis Hardyck, *Shadow and Substance: Attentional Irrelevancies and Perceptual Constraints in the Hemispheric Processing of Language Stimuli*, in CEREBRAL LATERALITY: THEORY AND RESEARCH 133, 133 (Frederick L. Kitterle ed., 1991).

47. See MICHAEL S. GAZZANIGA & JOSEPH E. LEDOUX, *THE INTEGRATED MIND* 78-79 (1978).

48. See D. Frank Benson, *Language in the Left Hemisphere*, in *THE DUAL BRAIN*, *supra* note 25, at 193, 200.

capacity to use verbal symbols propositionally; that is, to combine and sequence words to express larger concepts.⁴⁹

The right hemisphere, in contrast, contributes little to the hard skeleton of language's structure, and is almost entirely incapable of rule-based propositional speech.⁵⁰ It does, however, appear to contribute significantly to the production and comprehension of the more evocative or context-based aspects of language that are sometimes called "paralinguistic" or "pragmatic."⁵¹ There is clinical evidence, for example, that without the assistance of the right hemisphere, the brain is severely handicapped in expressing and reading the intonation and emotional color of language.⁵² The unassisted left hemisphere is rigidly

49. See ANNETT, *supra* note 19, at 117; see also Joseph E. Bogen, *The Other Side of the Brain: An Appositional Mind*, in *THE NATURE OF HUMAN CONSCIOUSNESS* 101, 108 (Robert E. Ornstein ed., 1973).

50. See Alan Searleman, *Language Capabilities of the Right Hemisphere*, in *FUNCTIONS OF THE RIGHT CEREBRAL HEMISPHERE* 87, 105 (Andrew W. Young ed., 1983). Even patients who have had their entire left hemisphere removed, however, are occasionally capable of singing well-known songs, repeating "over-learned, automatic" phrases, and (especially) cursing. See *id.* at 89-90. This is, interestingly, the sort of language that can be learned and remembered as a single "chunk," and is knit together rather more by melody and emotion than by the formal rules of syntax and grammar. Perhaps for similar reasons, isolated individual words can occasionally be uttered and can often be understood by the right hemisphere alone. See *id.* at 90-91. Comprehension of *concrete* words (such as "table" or "car") appears to be superior to the comprehension of *abstract* terms (such as "justice" or "harmony"). See BRYDEN, *supra* note 41, at 81-82; SPRINGER & DEUTSCH, *supra* note 18, at 152.

51. See Howard Gardner et al., *Missing the Point: The Role of the Right Hemisphere in the Processing of Complex Linguistic Material*, in *COGNITIVE PROCESSING IN THE RIGHT HEMISPHERE* 169, 173, 188 (Ellen Perelman ed., 1983).

52. See SPRINGER & DEUTSCH, *supra* note 18, at 152; see also JOANETTE ET AL., *supra* note 33, at 146. On the other hand, patients with severe damage to the language areas of the left hemisphere (Broca's and Wernicke's areas) are reported to be capable—even preternaturally capable—of reading the tonal meaning of language. Consider this account by Oliver Sacks of the reception given a televised presidential speech in an aphasia ward:

There he was, the Old Charmer, the Actor, with his practised rhetoric, his histrionics, his emotional appeal—and all the patients were convulsed with laughter. Well, not all: some looked bewildered, some looked outraged, one or two looked apprehensive, but most looked amused. . . . What could they be thinking? Were they failing to understand him? Or did they, perhaps, understand him all too well?

. . . . [I]t was the grimaces, the histrionisms, the false gestures and, above all, the false tones and cadences of the voice, which rang false for these wordless but immensely sensitive patients. It was to these (for them) most glaring, even grotesque, incongruities and improprieties that my aphasic patients responded, undeceived and undeceivable by words.

This is why they laughed at the President's speech.

literal in its interpretations, not fully appreciating the connotations of common words, the overall theme or point of a story, the subtleties of humor, or the broader (non-literal) meaning of metaphorical language.⁵³ It is impaired in judging the plausibility of a particular fact within the broader context of a story.⁵⁴ It may be handicapped in the processing of novel linguistic material that does not fit easily into a known set of rules,⁵⁵ and limited in dealing with verbal imagery.⁵⁶ Thus, the left hemisphere, performing alone, functions as if it were a "highly efficient, but narrowly programmed linguistic computer," a "context-free language machine."⁵⁷ And the right hemisphere, though a silent partner in most respects,⁵⁸ speaks softly, in a different voice, and listens to language with a differently attuned ear.

A second thoroughly well-documented generalization concerning hemispheric specialization is that the preeminence of the left hemisphere in formal verbal functions is balanced by a general preeminence of the right hemisphere in complex visual and spatial functions.⁵⁹ From the earliest methodical split-brain studies it has been dramatically apparent, for example, that the

OLIVER SACKS, *THE MAN WHO MISTOOK HIS WIFE FOR A HAT AND OTHER CLINICAL TALES* 80, 82-83 (1987).

53. See Nancy S. Foldi et al., *Pragmatic Aspects of Communication in Brain-Damaged Patients*, in *LANGUAGE FUNCTIONS AND BRAIN ORGANIZATION*, *supra* note 25, at 51, 82; Gardner et al., *supra* note 51, at 172, 182-83; Eran Zaidel, *Language in the Right Hemisphere*, in *THE DUAL BRAIN*, *supra* note 25, at 205, 221.

54. See Gardner et al., *supra* note 51, at 188.

55. Studies have shown, for example, an early preference for right hemispheric processing of the Hebrew script, the Morse Code, Braille, and a newly invented symbolic alphabet among novice students unfamiliar with those language systems. Over time, with familiarity, the processing preference shifts from right to left. See Zaidel, *supra* note 53, at 220.

56. See Benson, *supra* note 48, at 200; M.P. Bryden & Robert G. Ley, *Right Hemispheric Involvement in Imagery and Affect*, in *COGNITIVE PROCESSING IN THE RIGHT HEMISPHERE*, *supra* note 51, at 111, 113-20; Janice M. Millar & Harry A. Whitaker, *The Right Hemisphere's Contribution to Language: A Review of the Evidence from Brain-Damaged Subjects*, in *LANGUAGE FUNCTIONS AND BRAIN ORGANIZATION*, *supra* note 25, at 87, 95.

57. Gardner et al., *supra* note 51, at 188.

58. See *supra* note 50 and accompanying text.

59. See ANNETT, *supra* note 19, at 121; BRYDEN, *supra* note 41, at 70; SPRINGER & DEUTSCH, *supra* note 18, at 47; Andrew W. Young & Graham Ratcliff, *Visuospatial Abilities of the Right Hemisphere*, in *FUNCTIONS OF THE RIGHT CEREBRAL HEMISPHERE*, *supra* note 50, at 1, 23. The special ability of the right hemisphere in visuospatial functions is, however, somewhat less striking and less thoroughly substantiated than the special advantage of the left hemisphere in language functions. See ANNETT, *supra* note 19, at 122; BRYDEN, *supra* note 41, at 71.

isolated left hemisphere is inept at guiding the performance of such simple spatial tasks as the drawing of a cube,⁶⁰ or the arrangement of blocks to construct a particular pattern.⁶¹ These results were consistent with the common clinical observation of spatial disorientation in patients with right-hemispheric brain damage.⁶² A plausible inference from such early evidence was that the right hemisphere is laterally specialized to deal with all visual and spatially-oriented tasks and materials.

Researchers have indeed confirmed that the right hemisphere is superior to the left in a wide variety of important visuospatial abilities. These include the ability to appreciate the spatial relationships between and within objects;⁶³ to rotate images in the mind;⁶⁴ to discern hidden patterns in an otherwise random array;⁶⁵ and, of special importance, to generate, either physically or within the inner space of the mind, the image of a complete whole from incomplete or rearranged fragments.⁶⁶

60. See GAZZANIGA, *supra* note 34, at 49-50. Clinical studies with brain-damaged patients have revealed a recurrent pattern of deficiencies in drawing:

With left hemisphere lesions (forcing the patient to rely on the intact right hemisphere), patients tend to draw pictures that show poor discrimination of elements and tend to simplify and to lose detail while preserving spatial relationships, keeping the overall configuration coherent and intact. With right hemisphere damage, patients tend to draw pictures with laborious and haphazardly juxtaposed combinations of correctly discriminated features The whole lacks an overall coherent configuration or plan, and proportion and spatial inter-relationships are typically faulty.

BRADSHAW & NETTLETON, *supra* note 30, at 46-47.

61. See GAZZANIGA, *supra* note 34.

62. Following right-hemispheric injury, "patients easily become lost even in familiar surroundings; simple mazes baffle them; they can no longer describe well-known routes, use, or draw maps; they misjudge the size, distance, and direction of objects; they cannot match or copy accurately the slant of a line or the position of a dot on a page; they cannot copy simple shapes such as a four-pointed star, nor can they arrange blocks or sticks to form a required pattern." Robert D. Nebes, *Man's So-Called "Minor Hemisphere,"* UCLA EDUCATOR, Spring 1975, at 13, 14.

63. See BRADSHAW & NETTLETON, *supra* note 30, at 47.

64. See BRYDEN, *supra* note 41, at 70; CORBALLIS, *supra* note 43, at 47; Young & Ratcliff, *supra* note 59, at 22. It is perhaps a simple variation of this ability that accounts for reports that the right hemisphere has a superior capacity to recognize objects pictured from unusual viewpoints. See ANNETT, *supra* note 19, at 105; BRADSHAW & NETTLETON, *supra* note 30, at 48; Young & Ratcliff, *supra* note 59, at 21.

65. See BRADSHAW & NETTLETON, *supra* note 30, at 66; Young & Ratcliff, *supra* note 59, at 21-22. Also associated especially with the right hemisphere is the related ability to recognize objects by the separation of figures from ground. See BRADSHAW & NETTLETON, *supra* note 30, at 48; CORBALLIS, *supra* note 43, at 47.

66. The evidence for this last proposition comes from a variety of sources. The left hemisphere, for example, appears to be less capable than the right in the mental

Despite this evidence, however, it has become increasingly apparent that the left hemisphere can, after all, deal with spatially-oriented material to a limited degree, in its own distinctive way. If, for example, a task involving visual material can be performed by concentrating on isolated, defining features, or by the application of abstract rules, or by recourse to a verbal "tag" that categorizes the material, the left hemisphere can perform creditably; if, on the other hand, the task or material is especially resistant to strategies of this sort, the left hemisphere's ability to perform fades or vanishes altogether.⁶⁷ Thus, there appears to be a subtle division of competencies between the hemispheres in the realm of visuospatial functions, a counterpart to the division of hemispheric competencies already noted⁶⁸ in the realm of language functions.

reconstruction of "exploded" geometrical figures, in which the original figure is cut into pieces and the pieces slightly separated. It also performs poorly in identifying which of several circles represents the whole of which a particular arc is a piece. See BRADSHAW & NETTLETON, *supra* note 30, at 66; SPRINGER & DEUTSCH, *supra* note 18, at 47. Compared to the right hemisphere, the left has inordinate difficulty in recognizing objects that have been "visually degraded" by presenting them in mutilated, incomplete, or obstructed form. See ANNETT, *supra* note 19, at 105; BEATON, *supra* note 23, at 69; SPRINGER & DEUTSCH, *supra* note 18, at 48; Young & Ratcliff, *supra* note 59, at 20.

67. The left hemisphere can, for example, almost equal the performance of the right hemisphere in tests requiring the recognition and selection of simple rule-bound and easily nameable Euclidean forms like equilateral triangles. The performance of the left hemisphere declines, however, with multilateral shapes that are more difficult to code verbally, and drops to the level of pure chance with complex curved (topological) figures which the right hemisphere handles with much greater ease. See THOMAS R. BLAKESLEE, *THE RIGHT BRAIN* 65 (1980). Complex curved figures, of course, are forms that may be readily visualized but which resist reduction to an analytical code of any sort.

Even forms of great complexity, however, can sometimes be discriminated by the left hemisphere, if there is a dependable defining feature upon which it may focus and rely. Consider this description of a patient with damage to his right hemisphere:

By and large, he recognised nobody: neither his family, nor his colleagues, nor his pupil, nor himself. He recognised a portrait of Einstein because he picked up the characteristic hair and moustache; and the same thing happened with one or two other people. "Ach, Paul!" he said, when shown a portrait of his brother. "That square jaw, those big teeth—I would know Paul anywhere!" But was it Paul he recognised, or one or two of his features, on the basis of which he could make a reasonable guess as to his subject's identity? In the absence of obvious "markers", he was utterly lost. But it was not merely the cognition, the *gnosis*, at fault; there was something radically wrong with the whole way he proceeded. For he approached these faces—even of those near and dear—as if they were abstract puzzles or tests.

SACKS, *supra* note 52, at 13.

68. See *supra* text accompanying notes 46-58.

These divisions of competencies, considered together, suggest that there may be a single, fundamental distinction reflected in hemispheric specialization that is both more subtle and more comprehensive than a distinction based simply upon the nature of the material that is presented to the brain. The evidence from the laboratory strongly supports the view that the left hemisphere is specialized not so much for language itself but for processing data through the methods natural to language: that is, by the use of symbolic abstraction, linear sequence, structural rules, and a focus upon discrete components. And the right hemisphere appears to be specialized not so much for visuospatial material but for processing data through the methods natural to vision: that is, by wholes rather than pieces; at once rather than in a series of steps; and by concrete pattern recognition rather than by abstract categorization. It is a division of processing styles that can be broadly recharacterized as analytical on the one hand, and nonanalytical or holistic on the other.

Alternative characterizations have been offered,⁶⁹ and there is strong and lingering dissent to the notion that any single dichotomous description can fully capture the essence of hemispheric specialization.⁷⁰ The analytical/holistic processing distinction, however, is one that has generated significant support within the scientific community⁷¹ and has proven to have both descriptive and predictive power in a variety of contexts.⁷² It also

69. Among the proposed characterizations of the fundamental distinction between the processing styles of the left and right hemispheres have been "propositional versus appositional," "serial versus parallel," "focal versus diffuse," "temporal versus atemporal," and "rational versus intuitive." See BEATON, *supra* note 23, at 14.

70. See *id.* at 288; ANKE BOUMA, LATERAL ASYMMETRIES AND HEMISPHERIC SPECIALIZATION: THEORETICAL MODELS AND RESEARCH 125 (1990); BRYDEN, *supra* note 41, at 107; EFRON, *supra* note 41, at 1; J. Sergent & Michael C. Corballis, *Ups and Downs in Cerebral Lateralization*, in CEREBRAL LATERALITY: THEORY AND RESEARCH, *supra* note 46, at 175.

71. See, e.g., BRADSHAW & NETTLETON, *supra* note 30, at 66; JAMES F. IACCINO, LEFT BRAIN-RIGHT BRAIN DIFFERENCES: INQUIRIES, EVIDENCE AND NEW APPROACHES 29-40 (1993); ORNSTEIN, *supra* note 45, at 90-91; SPRINGER & DEUTSCH, *supra* note 18, at 51-52, 61; Nebes, *supra* note 62, at 16; Witelson, *supra* note 25, at 119. *But see* EFRON, *supra* note 41, at 1-2.

72. Perhaps the most convincing demonstration of its utility is the series of experiments which have shown that the hemispheres respond differently depending upon whether an analytical or a nonanalytical mental strategy is employed in processing *the same stimulus*. If, for example, an experimental subject listens to musical tones without attempting to analyze them, a PET (positron emission tomography) scan reveals heightened brain activity in the right hemisphere; if the

strikes a chord in the history of ideas which resonates across disciplines.⁷³ It may well be the fundamental distinction that underlies hemispheric specialization. If it is not, it nevertheless serves, at a minimum, as a convenient shorthand for the more complex cluster of specialized mental functions associated with each hemisphere.

However the division may be characterized, the hemispheres of the brain appear to divide the realm of the mind into two very distinct domains of thought that employ fundamentally different styles of processing information. These antipodal ways of knowing the world have been expressed historically in the cultural symbolism that has clustered about the left and right hands.⁷⁴ In a coincidence of symbol and science, they have now been expressed as well through the hard data of the neuropsychologist's laboratory.

II. LAWYERING WITH THE LEFT HAND

*Some chaos exists out there, and the brain seems to have more flexibility than classical physics in finding the order in it.*⁷⁵

"Law" and "order" are words that often travel as a matched pair. This may reflect not only the fact that the law is an ordering principle in society, a source of rules governing conduct, but also the fact that the practice of law, perhaps more than other disciplines, appears to rely on orderly, highly structured processes. Every court, after all, has its rules governing procedure

same subject is instructed to analyze the same notes by arranging them mentally along a scale, the PET scan reveals a shift of brain activity from the right to the left hemisphere. See RICHARD M. RESTAK, *THE BRAIN* 248-50 (1984). Similarly, when experimental subjects processed pictures of faces and bugs holistically, the right hemisphere showed superior processing ability; when the subjects "were set to attend to the characteristic features or elements, rather than to the overall configuration" (an analytical strategy), the left hemisphere showed superior processing ability for the same pictures. See BRADSHAW & NETTLETON, *supra* note 30, at 165.

73. See Warren D. TenHouten, *Cerebral-Lateralization Theory and the Sociology of Knowledge*, in *THE DUAL BRAIN*, *supra* note 25, at 341-58. For lengthy lists that loosely correlate hemispheric function with historical conceptions of a dual psyche or intelligence, see also CHARLES HAMPDEN-TURNER, *MAPS OF THE MIND* 89 (1981), and Bogen, *supra* note 21, at 25. Appearing on the lists are conceptions associated with such diverse sources as the I CHING, Descartes, Assagioli, Jung, Koestler, Buber, Levy-Strauss, Maslow, Schopenhauer, and Kuhn.

74. See *supra* notes 1, 20-21, and accompanying text.

75. JAMES GLEICK, *CHAOS: MAKING A NEW SCIENCE* 164 (1987).

and evidence, as well as a rule (embodied in the doctrine of *stare decisis*) dictating special deference to the conventional interpretation and application of rules. The world of the practicing lawyer, from outer appearances, may therefore seem to be a world built of little more than abstract rules and their analytical application; a world made to order for the legal scientist, the "right-handed" lawyer who draws exclusively upon the analytical powers of the mind.

Of course, the purely analytical, "right-handed" lawyer is more hypothetical than real. It may nevertheless be instructive, as a heuristic device, to consider how this hypothetical lawyer would be handicapped if brought to life and thrust into the actual world of lawyering. In what ways is analytical thought an insufficient resource for the practicing lawyer? The weaknesses of the lawyer's right hand will help reveal, in an indirect way, the hidden contributions of "left-handed" thought processes to the lawyer's work. In particular, it appears that the lawyer's left hand plays an especially important role in the perception and discrimination of emotion; in receiving and conveying information in the form of a narrative; and in the creative generation of hypotheses in the legal problem-solving process.

A. *Linear Thought in a Nonlinear World*

No matter how elaborate linear mathematics could get, with its Fourier transforms, its orthogonal functions, its regression techniques, . . . it inevitably misled scientists about their overwhelmingly nonlinear world.⁷⁶

It is a matter of looking at the whole.⁷⁷

A central strength—and, ironically, a critical weakness—of analysis is that it copes with complex natural data through a process of simplification. Faced with "the ceaseless motion and incomprehensible bustle of life,"⁷⁸ analysis reduces fluid complexity to a form that can be held motionless and managed in an orderly way, piece by piece, step-by-step. A principal way in

76. *Id.* at 80.

77. *Id.*

78. Gustav Mahler, describing the third movement of his Second Symphony, quoted in GLEICK, *supra* note 75, at 163.

which it does this is through symbolic abstraction: to adapt a phrase from the poet Wallace Stevens, it deals with "ideas about the thing, not the thing itself."⁷⁹ Analysis perceives the world in terms of conceptual categories, classifying new information according to preexisting standards or rules of definition.⁸⁰ Analytical thought thus operates in much the same way as language itself operates, through a series of symbolic representations that are always approximations, always one step removed from a much more diverse (and much less manageable) reality.

It is beyond dispute that abstract analysis is the principal conceptual tool in the legal workshop, and a tool of enormous power. It allows lawyers to generalize on the basis of diverse facts (working to abstraction from the bottom up), and to apply an existing legal rule or factual generalization to a new set of facts (working through abstraction from the top down). These two processes, or two directions of the same process, occupy a vast territory in the landscape—and the literature⁸¹—of legal reasoning. In particular, they give lawyers the power to translate the complex and undefined difficulties presented by a client into a problem of a known type that can be reduced to puzzle form and attacked by the use of a familiar set of rules.⁸²

The power of abstract analysis in dealing with complex natural data is, however, purchased at the price of a loss of concrete information: in the time-honored manner of classical science, abstract analysis reduces complexity by ignoring a portion of it.⁸³ Its weakness appears in those circumstances,

79. See WALLACE STEVENS, *Not Ideas About the Thing but the Thing Itself*, in THE COLLECTED POEMS OF WALLACE STEVENS 534, 534 (1954).

80. See CATEGORICAL PERCEPTION: THE GROUNDWORK OF COGNITION 554 (Stevan Harnad ed., 1987) (explaining that the process of symbolic representation categorizes new data by manipulating the existing "label repertoire").

81. See, e.g., WILLIAM E. READ, LEGAL THINKING: ITS LIMITS AND TENSIONS 80 (1986); WILLIAM P. STATSKY & R. JOHN WERNET, JR., CASE ANALYSIS AND FUNDAMENTALS OF LEGAL WRITING 281-317 (David Matz ed., 1977).

82. Jerome Bruner, citing the philosopher Weldon, has defined a *difficulty* as a "trouble with minimum definition"; a *problem* as a "difficulty upon which we attempt to impose a puzzle form"; and a *puzzle* as a game which "requires that we get from here to there, and there is at least one admissible route by which we can do so, but the choice of route is governed by definite rules that must not be violated." BRUNER, *supra* note 1, at 97. The beauty of transforming a complex difficulty into a problem of abstract puzzle form, of course, is that a puzzle can theoretically be solved, given sufficient effort and ingenuity.

83. "Perturbation theory," for example, is one traditional device that physicists and mathematicians use to attack complex nonlinear problems:

common in the life of a practicing lawyer, when complex data resists abstract reduction altogether, or when such a reduction may factor out essential information. One example of a task that appears to require a gestalt appreciation of an unedited set of concrete data, rather than abstract analytical reduction, is the recognition and interpretation of subtle displays of emotion.

B. Reading Emotion with the Left Hand

*Judgments of emotion, after all, involve the integration of information from a wide variety of different sources and therefore may provide an ideal example of the holistic or integrative perceptual process.*⁸⁴

Research results show, as a general pattern, left hemispheric weakness and special right hemispheric strength in the recognition of emotional states and the processing of emotional information.⁸⁵ This is true whether the emotional message is carried by the expression on a face,⁸⁶ as a second channel of meaning within the spoken word,⁸⁷ or in the tone of nonverbal sounds.⁸⁸ The hypothetical "right-handed" lawyer, relying strictly upon the analytical style of the left hemisphere, would therefore be severely handicapped in dealing with the emotional dimension of legal practice.

For purposes of calculation, you assume that the nonlinear problem is reasonably close to some solvable, linear problem—just a small perturbation away. You solve the linear problem and perform a complicated bit of trickery with the leftover part . . . With luck, your calculations converge toward a solution. Luck has a way of vanishing, however, whenever a problem is particularly interesting.

GLEICK, *supra* note 75, at 162. In spirit, the device is a lineal descendant of Newton's Method. *See id.* at 217.

84. BRYDEN, *supra* note 41, at 129.

85. *See id.* at 123-29; RHAWN JOSEPH, *THE RIGHT BRAIN AND THE UNCONSCIOUS: DISCOVERING THE STRANGER WITHIN* 71 (1992); SPRINGER & DEUTSCH, *supra* note 18, at 199.

86. Studies have shown a right-hemispheric superiority in the recognition of emotional expression in both photographs and drawings of faces. *See* Joan C. Borod et al., *Right Hemispheric Specialization for the Expression and Appreciation of Emotion: A Focus on the Face*, in *COGNITIVE PROCESSING IN THE RIGHT HEMISPHERE*, *supra* note 51, at 83, 86-87.

87. *See* Foldi et al., *supra* note 53, at 63. There is also some evidence, anecdotal in nature, of right-hemispheric involvement in reading the non-semantic content of gestures. *See id.* at 60.

88. *See* Borod et al., *supra* note 86, at 87.

The handicap would be a significant one, for the need to perceive, and to act upon, the emotional responses of others is pervasive in the practice of law. There may, of course, still be lawyers who regard law practice as an arid landscape from which emotion should be carefully drained; who, like Sergeant Joe Friday of *Dragnet*, are interested in "just the facts." The modern response to the surviving Joe Fridays of the profession is, however, Thomas Shaffer's observation that "feelings *are* facts,"⁸⁹ after all, and facts of peculiar importance in the practice of law.⁹⁰

One aspect of legal practice in which the lawyer's need to perceive and respond to emotion is especially important, and especially well-recognized,⁹¹ is the interaction of lawyer and client in the interviewing and counseling process. The accurate identification of a client's feelings will sometimes have a direct bearing on a substantive legal issue in a case.⁹² Ordinarily of far greater importance, however, is the substantial impact it can have upon a lawyer's ability to enhance the client-lawyer relationship itself,⁹³ the flow of communication within that relationship,⁹⁴ and

89. THOMAS L. SHAFFER & JAMES R. ELKINS, *LEGAL INTERVIEWING AND COUNSELING IN A NUTSHELL* 9 (2d ed. 1987) (emphasis added). The phrase "feelings are facts" is credited to Shaffer alone because it first appeared in the first edition of the cited text under his sole authorship. See THOMAS L. SHAFFER, *LEGAL INTERVIEWING AND COUNSELING IN A NUTSHELL* 3-5 (1976).

90. See SHAFFER & ELKINS, *supra* note 89 ("[A]ny accurate assessment of law office decisions must begin with the proposition that feelings are to law office decisions what facts—facts in the record—are to common-law appellate decisions.").

91. See, e.g., DAVID A. BINDER ET AL., *LAWYERS AS COUNSELORS: A CLIENT-CENTERED APPROACH* 21-22, 52-60 (1991); DAVID A. BINDER & SUSAN C. PRICE, *LEGAL INTERVIEWING AND COUNSELING: A CLIENT-CENTERED APPROACH* 20-37 (1977); SHAFFER & ELKINS, *supra* note 89, at 209-20; ANDREW S. WATSON, *THE LAWYER IN THE INTERVIEWING AND COUNSELING PROCESS* 53-69 (1976).

92. A client's fear of the complaining witness in a criminal case in which the client is charged with assault, for example, could bear upon the issue of self-defense.

93. Naturally, a lawyer would be severely handicapped in establishing or maintaining rapport with a client unless the lawyer had the ability to monitor subtle indications of client anxiety, embarrassment, impatience, anger, and the like. See generally SHAFFER & ELKINS, *supra* note 89, at 73-120.

94. See ROBERT M. BASTRESS & JOSEPH D. HARBAUGH, *INTERVIEWING, COUNSELING & NEGOTIATING: SKILLS FOR EFFECTIVE REPRESENTATION* 64 (1990). In particular, it may increase the power of the lawyer to facilitate communication by demonstrating, through what have become known as "active listening" techniques, empathic understanding of the emotional as well as the factual content of the client's story. See BINDER ET AL., *supra* note 91, at 52-68; John L. Barkai, *Active Listening: One Way to Be a Better Advocate, Counselor, and Business Person*, *TRIAL*, Aug. 1984, at 66, 68.

the quality of case-related decisions.⁹⁵ The importance of a lawyer's sensitivity to the subtle display of feelings has also been recognized in such varied contexts as negotiation,⁹⁶ jury selection,⁹⁷ and trial advocacy.⁹⁸

There have been attempts to systematize the process of reading emotion by resort to the piecemeal identification of individual nonverbal cues.⁹⁹ Studies indicate, however, that the implicit emotional messages carried by demeanor, or in the tone of a voice, resist analytical decoding. Reading such messages appears to require instead an integrative, gestalt appreciation of a complex and protean set of data.¹⁰⁰ Analysis, after all, deals with complex data in parts, and in freeze-frame. It can miss information, such as the nonverbal indicia of emotion, that is subtly embedded as a broad pattern across the whole of the data, or as a pattern that appears over time.

The recognition and interpretation of subtle displays of emotion serve as preliminary examples of ways in which competent lawyers, to one degree or another, engage routinely and unavoidably in "lawyering with the left hand." These examples begin to refute the dated notion that the phrase "thinking like a lawyer" means no more than "thinking analytically." Other important contributions of nonanalytical mental processes to the craft of the lawyer, however, are neither routinely acknowledged nor fully exploited. Among these is the critical, but less heralded,

95. See SHAFFER & ELKINS, *supra* note 89, at 58 ("The test of a good decision (tough choice), one which is carried out wholeheartedly, is not whether it has been unemotionally made, but rather whether all of the emotions involved have been expressed, recognized, and taken into account.").

96. See, e.g., ROGER FISHER AND WILLIAM URY, *GETTING TO YES: NEGOTIATING AGREEMENT WITHOUT GIVING IN* 29-30 (Bruce Patton ed., 2d ed. 1991); DONALD G. GIFFORD, *LEGAL NEGOTIATION: THEORY AND APPLICATIONS* 127-32 (1989).

97. See, e.g., JEFFREY T. FREDERICK, *THE PSYCHOLOGY OF THE AMERICAN JURY* 98-107 (1987).

98. See, e.g., RONALD J. MATLON, *COMMUNICATION IN THE LEGAL PROCESS* 192-94, 247-49 (1988).

99. See, e.g., WATSON, *supra* note 91, at 57-69 (presenting a set of purported "Principles for Decoding Nonverbal Language"). Watson asserts, for example, that "[t]he clenched fist very clearly and nearly always signifies anger in constraint," *id.* at 63 (footnote omitted), and that "if a client feels angry and is seeking to hide it, there may be a very quick 'flash' of the eyes followed swiftly by a smile," *id.* at 66.

100. See SHAFFER & ELKINS, *supra* note 89, at 220 ("The research suggests that accurate non-verbal communication comes across more or less in wholes, not in parts. We receive non-verbal signals most accurately when we receive them in broad, non-verbal impressions of our own."); see also BASTRESS & HARBAUGH, *supra* note 94, at 143-44; BRYDEN, *supra* note 41, at 41.

role of the lawyer's left hand in receiving and conveying information in narrative form.

C. *Stories, Arguments, and the Lawyer's Left Hand*

*A good story and a well-formed argument are different natural kinds. Both can be used as a means for convincing another. Yet what they convince of is fundamentally different: arguments convince one of their truth, stories of their lifelikeness.*¹⁰¹

The importance of a lawyer's ability to master information in the form of a story can scarcely be exaggerated.¹⁰² The story form is the lawyer's stock-in-trade, the way the lawyer ordinarily receives factual information, and a principal way in which the lawyer conveys factual information persuasively to an audience.¹⁰³ Cases begin with stories, often with the story told by a client in the small theater of a lawyer's office. Cases grow and transform on the basis of stories: new stories and pieces of stories from the client, stories from police officers and business executives and social workers and passersby, and stories told across the negotiation table. In the larger theater of the courtroom, lawyers become themselves principal storytellers, and the producers and directors of tales told by others.¹⁰⁴ It can even be said that a case "ends in

101. JEROME S. BRUNER, *Two Modes of Thought*, in ACTUAL MINDS, POSSIBLE WORLDS 11, 11 (1986).

102. For discussions of the importance of the story form in the lawyering process, see SHAFFER & ELKINS, *supra* note 89, at 22-45; Gerald P. López, *Lay Lawyering*, 32 UCLA L. REV. 1 (1984); and Albert J. Moore, *Trial by Schema: Cognitive Filters in the Courtroom*, 37 UCLA L. REV. 273 (1989). For more general explorations of the implications of the use of the narrative voice in the law, see *Lawyers as Storytellers & Storytellers as Lawyers: An Interdisciplinary Symposium Exploring the Use of Storytelling in the Practice of Law*, 18 VT. L. REV. 565 (1994); *Pedagogy of Narrative: A Symposium*, 40 J. LEGAL EDUC. 1 (1990); Symposium: *Legal Storytelling*, 87 MICH. L. REV. 2073 (1989); and Symposium: *Law and Literature*, 39 MERCER L. REV. 739 (1988).

103. Alison Anderson has emphasized how thoroughly the world of the lawyer is a world cast in story form. "[L]aw," she writes, "is not a collection of definitions and rules to be memorized and applied, but a culture consisting of storytellers, audiences, a set of standard stories, and a variety of conventions about the practice of the storytelling art." Alison G. Anderson, *Lawyering in the Classroom: An Address to First Year Students*, 10 NOVA L. REV. 271, 282 (1986).

104. For discussions of the presentation of evidence in story form at trial, see W. LANCE BENNETT & MARTHA S. FELDMAN, *RECONSTRUCTING REALITY IN THE COURTROOM: JUSTICE AND JUDGMENT IN AMERICAN CULTURE* (1981); PAUL BERGMAN, *TRIAL ADVOCACY IN A NUTSHELL* 9-63 (1989); and BINDER & BERGMAN, *supra* note 15, at 11-13.

story too, with a decision by a court or jury, or an agreement between the parties, about what happened and what it means."¹⁰⁵

Of course, when lawyers (and others) convey factual information, it is not always in the richly contextualized flow of the story form, in which individual details are ordinarily immersed in their natural factual surroundings. A second primary form in which lawyers convey factual information, different in its fundamental nature and effect from the story form, is the evidence-marshalling argument, which decontextualizes facts by categorizing them according to their legal significance. Story and argument represent antipodal modes of persuasive communication for the lawyer, the first drawing significantly upon the nonanalytical powers of the lawyer's left hand, and the second drawing primarily upon the prowess of the lawyer's analytical right hand.¹⁰⁶

A lawyer's evidence-marshalling argument is produced by running a story, or a collection of stories, through the legal analyzer. The process slices and dices the mass of available information, selects individual "pieces of evidence" for special attention, sorts them by issue, and, in its complete form, links

105. JAMES B. WHITE, *Telling Stories in the Law and in Ordinary Life: The Oresteia and "Noon Wine,"* in HERACLES' BOW: ESSAYS ON THE RHETORIC AND POETICS OF THE LAW 168, 168 (1985).

106. Others have associated story and argument with dichotomous modes of thought or styles of persuasion. Jerome Bruner, for example, has described two modes of thought which he calls the "narrative" and the "logico-scientific" (or "paradigmatic"), and identified them explicitly with storytelling and argumentation. See BRUNER, *supra* note 101, at 11-13. He argues that they represent complementary but quite distinctive ways of constructing reality that are "irreducible to one another." See *id.* James Boyd White has drawn a similar distinction between two "discordant modes of thought and expression"; between, as he puts it, "the mind that tells a story and the mind that gives reasons":

One is given to narrative, the other to analysis. Each works in its own way, and it is hard to imagine a conversation between them . . . ; but however inconsistent these voices seem, the lawyer must recognize both of them within himself. That he must master theoretical and analytic speech is plain enough, for this is the stuff of most legal reasoning and argument It should be equally evident that he must know how to tell a story, and how to listen to one [O]ne must master both sorts of discourse (both narrative and analysis) and put them to work, at the same time and despite their inconsistencies, in the service of a larger enterprise.

JAMES B. WHITE, *THE LEGAL IMAGINATION: STUDIES IN THE NATURE OF LEGAL THOUGHT AND EXPRESSION* 859 (1973); see also BERGMAN, *supra* note 104, at 241 (suggesting that evidence-marshalling may be the "polar opposite" of storytelling); BINDER & BERGMAN, *supra* note 15, at 44 (describing briefly two modes of thought, one associated with a "'marshal the evidence' type of reasoning," and one with a focus upon the overall story); López, *supra* note 102, at 30-36 (identifying story and argument as dichotomous modes of persuasion).

them inferentially to factual propositions of consequence to the case.¹⁰⁷ Though these inferential links can sometimes be extended into interlocking chains,¹⁰⁸ and though these chains of logic can be combined with story-elements,¹⁰⁹ the evidence-marshalling process itself remains the same—reductive, categorical, drawing upon abstract propositions, focusing upon pieces rather than context. It is, in a word, analytical.

A story, on the other hand, has neither the sound nor the feel of an evidence-marshalling argument. Rather than deconstructing experience by breaking it analytically into isolated pieces, a good story reconstructs a version of experience by presenting facts embedded, as they are in life, in an information-rich, particularized context.¹¹⁰ Though a story may be coupled with an explanation (that is to say, with an argument about its meaning), the information in a story proper, unlike the evidence in a legal argument, comes unexplained in terms of legal significance, uncategorized by issue, unlabeled with legal “tags.”¹¹¹ Its concrete sensory details are linked not with abstract propositions, but with one another in natural associational clusters.

An encounter with a good story is therefore, in several ways, a closer approximation of the way in which the mind encounters the world than is an evidence-marshalling argument.¹¹² This

107. See, e.g., BERGMAN, *supra* note 104, at 241-48 (describing the evidence-marshalling process in the context of a closing argument at trial).

108. See generally Albert J. Moore, *Inferential Streams: The Articulation and Illustration of the Trial Advocate's Evidentiary Intuitions*, 34 UCLA L. REV. 611 (1987) (employing a more fluid metaphor).

109. See, e.g., THOMAS A. MAUET, FUNDAMENTALS OF TRIAL TECHNIQUES 275, 281-96 (2d ed. 1988) (describing—and prescribing—the use of narrative elements in combination with evidence-marshalling argument).

110. See BENNETT & FELDMAN, *supra* note 104, at 7 (defining stories as communication devices that surround actions with interpretive contexts); Toni M. Massaro, *Empathy, Legal Story-Telling, and the Rule of Law: New Words, Old Wounds?*, 87 MICH. L. REV. 2099, 2105 (1989) (describing storytelling as a way of “bringing things down to *context*, to individual storytellers and their unique experience”).

111. See BERGMAN, *supra* note 104, at 12-13 (describing stories as being themselves “devoid of legal conclusions”); WHITE, *supra* note 106, at 859, 879 (identifying explanation and narrative as distinct varieties of discourse).

112. Several scholars have noted the close correlation between the way in which a narrative is experienced and the experience of everyday life, and contrasted both to the experience of abstract or theoretical discourse. See, e.g., JAMES B. WHITE, WHEN WORDS LOSE THEIR MEANING 28 (1984); Massaro, *supra* note 110; Steven L. Winter, *The Cognitive Dimension of the Agon Between Legal Power and Narrative Meaning*, 87 MICH. L. REV. 2225, 2228 (1989).

allows an audience to “live” a story in a way that it could not be said to “live” an evidence-marshalling argument; the well-wrought story, as a rough mimic of life, carries a special potential to engage its audience in vicarious experience.¹¹³ It is precisely this quality of stories—their ability to convey a vivid sense of lifelikeness and thereby to draw an audience into vicarious experience—that is lost when factual information is broken into pieces, abstracted from context, and denatured by analysis.

A story is, to be sure, a set of verbal symbols structured according to the rules of syntax and grammar, and therefore carries a meaning that can be (and, indeed, must be) constructed and decoded in analytical fashion by the mind’s “linguistic computer.”¹¹⁴ Moreover, it is the analytical mind that must construct the inferential links between the raw details of a story, on the one hand, and abstract legal rules, on the other.¹¹⁵ Analytical abilities therefore play a crucial, and an inevitable, role in story comprehension, story interpretation, and storytelling.

Analytical abilities alone, however, are radically insufficient for full competence at the comprehension and telling of stories.¹¹⁶ The meaning of a story is not limited to the kind of knowledge that can be derived from a literal decoding of its words or inferred from an atomistic analysis of the legal significance of its details. Vicarious participation in the constructed world of a narrative

113. Indeed, it has been suggested that the projective process through which an audience “lives” a story experience is what “makes possible narrative understanding.” See Winter, *supra* note 112, at 2277.

When someone tells us a story, he or she invites us to enter a constructed world. . . . We imagine ourselves as the protagonist and picture ourselves in the protagonist’s shoes as we proceed from introduction to conclusion. Our very success in understanding the story is simultaneously the narrator’s success in persuading us—at least temporarily—to imagine the world in a particular way.

Id. at 2272.

114. See *supra* note 57 and accompanying text.

115. See *supra* text accompanying notes 78-83. Abstract inference is thought to be largely the province of the brain’s analytical left hemisphere. See GAZZANIGA, *supra* note 34, at 99, 190. It has been suggested, however, that particular inferential tasks that require the use of visual imagery may be processed, at least in part, by the right hemisphere. See Millar & Whitaker, *supra* note 56, at 97.

116. As one scholar has noted, “[s]tories and story-telling de-emphasize the logical and resurrect the emotive and intuitive.” López, *supra* note 102, at 10. “If arguments speak to and about the rational person, stories speak to and about the whole (emotional, irrational, mystical, needing, loving, hating, and rational) person.” *Id.* at 34-35.

opens access to an empathic understanding of narrative events,¹¹⁷ different in kind from the conceptual understanding gained through analysis.¹¹⁸ It is an experiential understanding acquired by "trying on" a story imaginatively and testing its "fit" and its "feel" from within, and depends more upon a gestalt appreciation of context and connotation than upon a literal-minded focus upon isolated details. Such an understanding, not simply of the meaning of a story's details but of a "meaning beyond the details,"¹¹⁹ turns out to be largely beyond the grasp of the lawyer's right hand, but within easy reach of the left.

That this should be so is not surprising because the vicarious experience of story-events, upon which empathic understanding of a story is grounded, is by its nature an imaginative participation in matters not personally experienced through the physical senses. It therefore requires an exercise of the nonanalytical image-making and image-manipulating powers of the mind.¹²⁰ It

117. "[L]ike the metaphor, narrative literature, when it is good, is the bridge that facilitates empathic understanding, and the literary person knows this. Metaphor and narrative are the means by which we come to understand what was initially foreign." Robin West, *Economic Man and Literary Woman: One Contrast*, 39 MERCER L. REV. 867, 874 (1988) (footnote omitted). "The audience 'lives' the story-experience, and is brought personally to engage in the process of constructing meaning out of another's experience. Through this process, the audience can achieve a measure of understanding and empathy." Winter, *supra* note 112, at 2277 (footnote omitted). "Stories tend to work directly from 'experiential understanding' Consequently, narrative may be a particularly powerful means of facilitating empathic understanding: a concrete story comes closest to actual experience and so may evoke our empathic distress response more readily than abstract theory." Massaro, *supra* note 110, at 2105. "Stories, whether real or potentially real, provide listeners with the vivid historical detail necessary for a vicarious experience that may awaken empathy." Phyllis Goldfarb, *A Theory-Practice Spiral: The Ethics of Feminism and Clinical Education*, 75 MINN. L. REV. 1599, 1632-33 (1991) (footnote omitted).

118. Robin West has emphasized the "left-handed" nature of the knowledge empathically acquired through narrative: "[I]t is not rational knowledge. Knowledge of the other's subjectivity is not rationally acquired, and it cannot be rationally calculated, quantified, aggregated, or compared." West, *supra* note 117, at 877. Phyllis Goldfarb has argued that narratives engage the listener in a way that promotes "a fuller human understanding than analytic reasoning alone can sometimes provide." Goldfarb, *supra* note 117, at 1633 (footnote omitted).

119. See BRUNER, *supra* note 101, at 36.

120. See *supra* notes 64-67 and accompanying text. The creation of visual mental images is a function of mind ordinarily associated with the right hemisphere. See Bryden & Ley, *supra* note 56, at 113. It is therefore not surprising that the surgical removal of the right hemisphere (a rare and dramatic operation ordinarily limited to cases of malignancy) is reported to produce a notable deficit in the ability to imagine. See BLAKESLEE, *supra* note 67, at 151. There is evidence, however, that

is, moreover, a creative imaginative enterprise that ordinarily requires a substantial "filling in" of missing details by the listener,¹²¹ who makes sense of a story by painting in the open spaces from the palette of personal experience or conventional expectation.¹²² Such a process is precisely analogous, and perhaps identical, to the synthetic pattern-recognition process by which the right hemisphere of the brain mentally generates the image of a complete whole from fragmentary visual information.¹²³

There is substantial research evidence that the analytical left hemisphere, despite its considerable prowess in formal verbal functions,¹²⁴ does indeed rely heavily upon the global processing style of the right hemisphere to appreciate those aspects of a story that depend significantly upon empathic understanding¹²⁵ and sensitivity to context¹²⁶ or connotation.¹²⁷ In particular, a

the left hemisphere, by virtue of its specialization for categorical symbolic representation, is capable of producing mental representations of "easily categorized (and named) shapes." Stephen M. Kosslyn, *Seeing and Imagining in the Cerebral Hemispheres: A Computational Approach*, 94 *PSYCHOL. REV.* 148, 155, 162 (1987). Kosslyn has postulated that image generation may actually involve an interplay between language-like and picture-like memories. See HOWARD GARDNER, *THE MIND'S NEW SCIENCE: A HISTORY OF THE COGNITIVE REVOLUTION* 328 (1985).

121. See BERGMAN, *supra* note 104, at 69-70; David F. Chavkin, *Fuzzy Thinking: A Borrowed Paradigm for Crisper Lawyering*, 4 *CLINICAL L. REV.* 163, 177, 181 (1997); Peter Tillers & David Schuman, *A Theory of Preliminary Fact Investigation*, 24 *U.C. DAVIS L. REV.* 931, 959 (1991).

122. See López, *supra* note 102, at 5-6 ("'Given' information is often augmented with much 'assumed' information" drawn from "stock stories" based on personal experience, vicarious experience, and even "often-used metaphors.").

123. See *supra* note 66 and accompanying text.

124. See *supra* notes 48-49 and accompanying text.

125. Howard Gardner and his colleagues, for example, have compared the abilities of normal and brain-damaged subjects in dealing with complex linguistic information presented in the story form. They conclude that patients with unilateral damage to their right hemispheres exhibit a "striking amount of difficulty" in handling such material. See Gardner et al., *supra* note 51, at 185; see also HOWARD GARDNER, *ART, MIND, AND BRAIN* 314 (1982) ("In characterizing these deficiencies, we say that the patients have difficulty accepting the story on its own terms. To borrow from Coleridge, they are unable to adopt a 'willing suspension of disbelief.'"); Gardner et al., *supra* note 51, at 187 ("They seem unable to honor the world of the fictive, the imaginary . . .").

126. See *supra* notes 51-58 and accompanying text. Compared to those with unilateral damage to their left hemispheres, and to normal subjects, patients with right-hemispheric brain damage are disproportionately impaired in the comprehension of "contextual information" that requires "integration across the boundary of the clause." Gardner et al., *supra* note 51, at 188. In dealing with stories, "such patients exhibit clear and recurring difficulties relating to the abilities to conceptualize the unit as a whole." *Id.* at 187. They "are likely to focus excessively on a single point and thus may fail to integrate the content with the surrounding

global processing style appears to be essential for the appreciation of the emotional content implicit in a story;¹²⁸ for the recognition of the unstated motivations of a story's characters;¹²⁹ and, more generally, for an assessment of the plausibility of,¹³⁰ and the relationship between,¹³¹ particular events in the overall context of a story. The analytical mind masters individual details and literal meanings, but may "miss the point" of the story as a whole.¹³² Thus, from the evidence of the research laboratory, "the right hemisphere emerges as vital, perhaps even more important than the left hemisphere, in dealing with narratives."¹³³

For the lawyer functioning as a *hearer* of stories, the nonanalytical thought processes associated with the right hemisphere therefore perform a role of exceptional importance. In particular, they give the lawyer a fuller ability to assess the verisimilitude and emotional authenticity of the stories that make up a lawyer's standard diet of information about a case,¹³⁴ a talent of immeasurable value in a variety of practice settings.¹³⁵ They

information." Foldi et al., *supra* note 53, at 82.

127. See *supra* note 53 and accompanying text; see also Foldi et al., *supra* note 53, at 81 ("[R]ight brain-damaged patients can rarely be faulted on literal comprehension but often show an inability to go beyond the literal.")

128. See Foldi et al., *supra* note 53, at 80, 82. Researchers have found that patients with damaged right hemispheres frequently have difficulty in drawing "the proper inferences about certain kinds of information, particularly emotional contents. This difficulty seems due less to a deficit in logical inference per se—answers often reflected what *could* have happened—than to a dampened appreciation of the kind of emotion in fact experienced by the individual in question." Gardner et al., *supra* note 51, at 185.

129. See Foldi et al., *supra* note 53, at 80.

130. See *id.*; see also *supra* note 54 and accompanying text. Gardner and his colleagues have suggested that patients with unilateral right-hemispheric brain damage have difficulties in dealing with narrative material in part because they lack a "plausibility metric." See GARDNER, *supra* note 125, at 315; see also Gardner et al., *supra* note 51, at 186 ("Normal individuals appear able to assess, with reference to a given element, whether that given element is appropriate to a given context. It is precisely this ability to assess plausibility that seems vitiated in many right hemisphere patients.")

131. Patients with unilateral right-hemispheric brain damage are "unable to figure out the underlying architecture or composition of a story—the nature of and relationship between the various parts and characters. Instead, each part stands alone, a single brick unrelated to any other—or to the entire edifice." GARDNER, *supra* note 125, at 315; see also Gardner et al., *supra* note 51, at 187.

132. See GARDNER, *supra* note 125, at 315-16.

133. *Id.* at 311.

134. See *supra* notes 102-04 and accompanying text.

135. See, e.g., BERGMAN, *supra* note 104, at 32-57 (evaluating the credibility of testimony and of witnesses in the trial advocacy setting); BINDER ET AL., *supra* note

also help a lawyer to bring together, from the individual details and fragments of stories collected from a variety of sources, a single vision of the overall narrative of a case—an overarching sense of the whole. It is a critical asset to the practicing lawyer, both in the process of case investigation¹³⁶ and in the process of case presentation,¹³⁷ when the lawyer turns from a *hearer* to a *teller* of stories.

As a storyteller at trial, the lawyer's task is to fashion a convincing, and emotionally appealing, recreation of life that will engage the fact finder in a vicarious experience of the overall narrative of the case. Through analytical argument (the right-handed counterpoint to narrative) the lawyer must also match that engaging human story with an abstract, "stock" legal story that has a known ending that is favorable to the client.¹³⁸ Thus, storytelling and argument work hand-in-hand in the litigation setting, but each hand performs a separate, and equally vital, function. The right hand analyzes the available evidence in light of the law and marshals items of evidence that tend to make a factual proposition of consequence more probable, or less probable, as the case may be. It employs, that is to say, a traditional *rationalist* standard of legal relevance in the construction of an evidence-marshalling argument.¹³⁹ The left hand synthesizes the available information and selects webs of contextual details that bear upon the lifelikeness and emotional appeal of the reconstructed story being told at trial. It employs what may be termed

91, at 250-51 (identifying fabrication in the client interview); BINDER & BERGMAN, *supra* note 15, at 136-45 (assessing story plausibility as an aspect of fact investigation).

136. See Tillers & Schuman, *supra* note 121, at 1009 ("The workings of any network of marshalling systems [in the preliminary fact investigation process] are inexplicable without the supposition that people have the capacity to regulate the detailed workings of individual marshalling strategies by some sort of global, synthetic perspective.").

137. See, e.g., John Nivala, *An Architecture for Advocacy: A Sense of the Whole*, 17 J. LEGAL PROF. 19 (1992).

138. See Anderson, *supra* note 103, at 274-77, 282.

139. See, e.g., FED. R. EVID. 401. It has been postulated that the Federal Rules of Evidence governing relevance codify a "Rationalist Tradition" of evidence which, among other things, endorses the centrality of inductive reasoning and argument in the process of proof. See TERENCE ANDERSON & WILLIAM TWINING, *ANALYSIS OF EVIDENCE: HOW TO DO THINGS WITH FACTS BASED ON WIGMORE'S SCIENCE OF JUDICIAL PROOF* 103 (1991).

an *aesthetic* standard of relevance,¹⁴⁰ the standard of the lawyer functioning less as the scientist, and more as the artist.

D. Hypothesis Generation: The Process of Discovery

*Reaching for knowledge with the right hand is science. Yet to say only that much of science is to overlook one of its excitements, for the great hypotheses of science are gifts carried in the left hand.*¹⁴¹

From the earliest times, men and women have gazed at the night sky and discovered familiar patterns in the stars. Some looked at a particular collection of stars and saw a bear, and named the constellation "Ursa Major." Others, looking at the same collection of stars, saw instead a great ladle reclining in the sky, and called it "The Big Dipper." It is the nature of the human mind to seek out such patterns, to find or invest meaning in even the sparsest and most ambiguous data.¹⁴² In its most basic form, this is the process of preliminary hypothesis formation: the generation of tentative initial interpretations to account for incomplete or ambiguous data.

An analogous process occurs in the legal setting at the outset of the factual investigation of a case, when information is

140. The Supreme Court has recently endorsed a concept of relevance that acknowledges the special role of storytelling in the courtroom, and that appears to go well beyond a narrow, "rationalist" model of relevance and to incorporate what may be termed "aesthetic" considerations:

[M]aking a case with testimony and tangible things not only satisfies the formal definition of an offense, but tells a colorful story with descriptive richness. . . . Evidence thus has force beyond any linear scheme of reasoning, and as its pieces come together a narrative gains momentum, with power not only to support conclusions but to sustain the willingness of jurors to draw the inferences, whatever they may be, necessary to reach an honest verdict. . . . Thus, the prosecution may fairly seek to place its evidence before the jurors, as much to tell a story of guiltiness as to support an inference of guilt. . . .

Old Chief v. United States, 117 S. Ct. 644, 653-54 (1997); see also López, *supra* note 102, at 33 (suggesting that there is a different and, as he puts it, a "looser" standard of relevance for storytelling than for argument).

141. BRUNER, *supra* note 1.

142. See J.S. COVINGTON, JR., *THE STRUCTURE OF LEGAL ARGUMENT AND PROOF* 133 (1993) ("Human reasoning seems to have an imperative that says 'fill in the blanks to make the idea complete' when a few pieces of data are given. . . . Apparently of necessity, the mind provides evidence to make things seem sensible."); see also BETTY EDWARDS, *DRAWING ON THE ARTIST WITHIN* 206-07 (1986); GABRIELE L. RICO, *WRITING THE NATURAL WAY* 90 (1983).

typically sparse,¹⁴³ and the need for interpretive hypotheses, however tentative, is especially compelling.¹⁴⁴ Ordinarily, cases with the potential for litigation involve the need to reconstruct an historical event of legal significance.¹⁴⁵ There is, of course, no direct access to an event that has already occurred, but only access to the indirect traces it has left behind in the fragile memories of witnesses, in physical evidence, and the like. Thus, case investigation often involves the interpretation of radically incomplete evidence, of historical fragments that must be reconstructed imaginatively in the mind to form a whole.¹⁴⁶ Fortunately for the partisan advocate, those fragments can ordinarily be reconstructed in a variety of ways. Many pictures can be seen in, and generated from, the scattered constellation of preliminary evidence.¹⁴⁷

How is it that the human mind goes about this process of constructing preliminary interpretations to account for ambiguous or incomplete data? Consider first the *perceptual* process by which patterns can be discovered in an amorphous visual array like a formation of clouds. Confronted with such an image, the mind may at first see nothing more than the clouds themselves; then, perhaps after a period during which the mind scans the image for further meaning, a recognizable shape may seem to

143. See ANDERSON & TWINING, *supra* note 139, at 84; David A. Schum, *Probability and the Processes of Discovery, Proof and Choice*, 66 B.U. L. Rev. 825, 842 (1986).

144. See BINDER & BERGMAN, *supra* note 15, at 164 ("For the most part . . . one cannot seek information in the absence of a theory which makes that information relevant.").

145. See *id.* at 4; COVINGTON, *supra* note 142, at 61.

146. This tentative construction then forms the basis for the search for new evidence, which may lead to the reformulation of the initial hypothesis, and so on. See ANDERSON & TWINING, *supra* note 139, at 84; BINDER & BERGMAN, *supra* note 15, at 167; Schum, *supra* note 143, at 832.

147. See Schum, *supra* note 143, at 833; Tillers & Schuman, *supra* note 121, at 960; see also NORWOOD R. HANSON, PATTERNS OF DISCOVERY 17 (1961) ("There are indefinitely many ways in which a constellation of lines, shapes and patches may be seen."); THOMAS S. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS 76 (1970) ("Philosophers of science have repeatedly demonstrated that more than one theoretical construction can always be placed upon a given collection of data."). For the lawyer, of course, unlike the scientist, hypothesis formation is ordinarily not a neutral task. Thus, when the lawyer scans a preliminary array of data, the kind of hypotheses being sought are those that might account for the data *and* be consistent with the interests of the client. See ANDERSON & TWINING, *supra* note 139, at 84; BINDER & BERGMAN, *supra* note 15, at 164.

“appear” within the cloud array.¹⁴⁸ Such moments of perceptual discovery—when the random features of a cloud coagulate in the mind to form a galloping horse, perhaps, or a sailing ship—tend to occur in a characteristic fashion. The discovered shape tends to appear at once, rather than over a span of time, and as a whole, rather than part-by-part.¹⁴⁹ Moreover, the discovery typically occurs not because the mind has methodically applied an abstract set of rules or defining propositions about galloping horses or sailing ships to the data, but because the data, considered as a whole, bears a rough “family resemblance” to images of horses or ships that the mind has encountered before. Perceptual discovery is, in short, a process of mind that bears the distinctive hallmarks of nonanalytical thought: it is characterized by the simultaneous, holistic, non-propositional processing of data.¹⁵⁰

Can the same be said for the *conceptual* process by which preliminary hypotheses are generated to account for incomplete factual data of other sorts, including the fragmentary information routinely confronting lawyers at the outset of a typical case? It does seem that the conceptual pathway from data to hypothesis—from fragments to a vision of the whole from which those fragments could have come—does not run through traditionally-acknowledged inferential channels.¹⁵¹ Inductive inference may be

148. See RICO, *supra* note 142, at 35. A more dramatic version of the same sort of perceptual process can occur in the viewing of so-called “Magic-Eye” stereograms. These are images which have been systematically fragmented by computer, but which the mind can (sometimes) reconstruct into striking three-dimensional visions. See, e.g., N.E. THING ENTERPRISES, MAGIC EYE III—VISIONS: A NEW DIMENSION IN ART (1994).

149. See RICO, *supra* note 142, at 35.

150. See *supra* text accompanying notes 68-69. Compare this discussion of the process by which fragmented images of animals, used in the Street Gestalt Completion Test, are recognized as complete figures:

The fragments can be recognized as [animals] only by a simultaneous grasping of all the particular fragments. Recognition does not come about through any sequence of logical operations constituting an analysis of these fragments; words and propositions about the fragments are of no value. Recognition comes about instantaneously; the animals are seen all at once or not at all. The problem is solved not through analysis but through synthesis

WARREN D. TENHOUTEN & CHARLES D. KAPLAN, SCIENCE AND ITS MIRROR IMAGE: A THEORY OF INQUIRY 14 (1973). Substantial research confirms that it is indeed the nonanalytical right hemisphere of the brain that is predominant in such processes of mind. See *supra* notes 63-66 and accompanying text; text accompanying notes 124-25, *supra*.

151. Current schools of thought regarding inference in conditions of uncertainty, from Pascalians to Baconians to “fuzzy probability” theorists and

helpful in assessing whether particular facts make it more or less probable that a given hypothesis is true.¹⁵² Deductive inference may be helpful in suggesting factual conclusions that are implicit in a given hypothesis that is taken to be true.¹⁵³ Neither of these primary methods of analytical inference, however, appears to offer assistance in the genesis of the original hypothesis itself.¹⁵⁴

The philosopher Charles Sanders Peirce used the term "abduction"¹⁵⁵ to refer to the imaginative reasoning process¹⁵⁶—fundamentally different in nature from either deduction or induction¹⁵⁷—by which hypotheses are generated.¹⁵⁸ It is a concept about which there has been a significant revival of interest in recent years,¹⁵⁹ even within the closed circle of legal

beyond, have much to say about the testing of hypotheses once formed, but little or nothing to offer on the subject of initial hypothesis generation. See Schum, *supra* note 143, at 847-53 (Shafer/Dempster School), 843-59 (Bacon/Mill/Cohen School), 859-65 (Pascal/Bayes School), 865-69 (Zadeh School), 869-72 (Scandinavian School).

152. See ANDERSON & TWINING, *supra* note 139, at 446.

153. See WILLIAM TWINING & DAVID MIERS, *HOW TO DO THINGS WITH RULES* 256 (3d ed. 1991).

154. See DOUGLAS R. ANDERSON, *CREATIVITY AND THE PHILOSOPHY OF C.S. PEIRCE* 27 (1987) ("[I]nduction cannot produce conjectures or hypotheses. Its function is properly that of attesting to or . . . of refuting given hypotheses."); HANSON, *supra* note 147, at 72 (footnote omitted) ("H-D [hypothetico-deductive] accounts begin with the hypothesis as given, as Mrs. Beeton's recipes begin with the hare as given. A preliminary instruction in many cookery books, however, reads 'First catch your hare.'"); Schum, *supra* note 143, at 838 ("Apparently, we cannot turn some formal or logical crank and have useful hypotheses emerge.").

155. Peirce traced the pedigree of the concept of abduction to Aristotle and first proposed the term as a translation of the Aristotelian term "*apagogue*." See ANDERSON, *supra* note 154, at 14-15. He sometimes used alternative terms to describe the same concept, including the terms "retroduction," "hypothesis," "presumption," and "originary argument." See Nancy Harrowitz, *The Body of the Detective Model: Charles S. Peirce and Edgar Allan Poe*, in DUPIN ET AL., *THE SIGN OF THREE* 179, 181 (Umberto Eco & Thomas A. Sebeok eds., 1983).

156. See Tillers & Schuman, *supra* note 121, at 987.

157. See 1 CHARLES S. PEIRCE, *COLLECTED PAPERS OF CHARLES SANDERS PEIRCE* ¶ 65 (Charles Hartshorne et al. eds., 1931-1958); see also ANDERSON, *supra* note 154, at 42 ("Whereas in deduction or induction we work with ideas we select or have selected (i.e., hypotheses), in abduction we are fishing for an idea—'Abduction seeks a theory.'"). In Peirce's view, all reasoning can be divided into these three basic types. See 5 PEIRCE, *supra*, ¶ 161.

158. See 5 PEIRCE, *supra* note 157, ¶ 171 ("Abduction is the process of forming an explanatory hypothesis.").

159. See Schum, *supra* note 143, at 839; see, e.g., ANDERSON, *supra* note 154; DUPIN ET AL., *supra* note 155; HANSON, *supra* note 147; DAVID LAMB, *DISCOVERY, CREATIVITY AND PROBLEM-SOLVING* 61 (1991) ("Although Peirce was a nineteenth-century contemporary of William James and John Stuart Mill he is a philosopher whose ideas belong to the last decade of the twentieth century. . . ."); THOMAS A. SEBEOK & JEAN UMIKER-SEBEOK, "YOU KNOW MY METHOD:" A JUXTAPOSITION OF

scholarship.¹⁶⁰ In general, according to Peirce, "Deduction proves that something *must* be; Induction shows that something *actually* is operative; Abduction merely suggests that something *may* be."¹⁶¹ It has recently been asserted that "[f]or the lawyer, abduction describes the creative form of reasoning required to see the hypotheses that are not apparent."¹⁶²

Peirce himself never provided an altogether comprehensive account of abduction.¹⁶³ From his writings, however, it is possible to piece together a three-part description of the thought process he had in mind: (1) an unaccounted for, "surprising" fact or set of facts is observed and pondered; (2) a particular hypothesis arises in the mind which, if true, would render the fact or set of facts no longer surprising, but, instead, explicable as a matter of course; and (3) the hypothesis is therefore regarded as provisionally plausible.¹⁶⁴ The "abductive suggestion" which arises in the mind during this process, according to Peirce, "comes to us like a flash" and "is an act of *insight*, although of extremely fallible insight."¹⁶⁵ Drawing upon more standard epistemological terms, abduction has also been described as "the acceptance or creation of a minor premiss as a hypothetical solution to a syllogism whose major premiss is known and whose conclusion we 'find to be a fact.'"¹⁶⁶

CHARLES S. PEIRCE AND SHERLOCK HOLMES (1980).

160. See, e.g., ANDERSON & TWINING, *supra* note 139, at 83-85, 164; Scott Brewer, *Exemplary Reasoning: Semantics, Pragmatics, and the Rational Force of Legal Argument by Analogy*, 109 HARV. L. REV. 923, 945-49 (1996); Jeanne L. Schroeder, *Abduction from the Seraglio: Feminist Methodologies and the Logic of Imagination*, 70 TEX. L. REV. 109, 179-81 (1991); Schum, *supra* note 143, at 838-40; Tillers & Schuman, *supra* note 121, at 986-93.

161. 5 PEIRCE, *supra* note 157, ¶ 171.

162. ANDERSON & TWINING, *supra* note 139, at 84. The authors go on to assert that abductive reasoning is "at least as important as inductive and deductive reasoning" throughout the investigative stages of a legal dispute. *Id.* at 164.

163. See LAMB, *supra* note 159, at 64.

164. See HANSON, *supra* note 147, at 86; LAMB, *supra* note 159, at 63, 75; 5 PEIRCE, *supra* note 157, ¶ 189.

165. 5 PEIRCE, *supra* note 157, ¶ 181.

166. ANDERSON, *supra* note 154, at 15. Thus, in Peirce's classic example, the structural relationship of deduction, induction, and abduction can be illustrated in this way:

Deduction

Rule: All the beans from this bag are white.

Case: These beans are from this bag.

Result: These beans are white.

Induction

Case: These beans are from this bag.

Result: These beans are white.

Rule: All the beans from this bag are white.

Norwood Hanson, who revived and elaborated upon Peirce's concepts,¹⁶⁷ suggested that abduction (or, as he preferred to call it, "retroduction"¹⁶⁸) depends, at root, upon pattern-recognition.¹⁶⁹ For Hanson, the discovery of a provisional hypothesis is accomplished through the perception of an intelligible pattern, a "conceptual Gestalt" in data that "makes it possible to observe phenomena as being of a certain sort, and as related to other phenomena."¹⁷⁰ This mental process, he suggested, is essentially the same whether it occurs in the context of seeing a visual pattern in a cluster of dots or conceiving of a scientific theory to account for a cluster of data.¹⁷¹ In both contexts, the mind organizes novel information and makes it intelligible not by inductive or deductive processes, and not by random clustering, but by recognizing a familiar pattern in an otherwise unfamiliar array of data.¹⁷² The significance of any one piece of datum remains elusive until a sense of the whole is grasped, abductively, through pattern-recognition; thereafter, each part "becomes understood as a matter of course."¹⁷³

Abduction

Rule: All the beans from this bag are white.

Result: These beans are white.

Case: These beans are from this bag.

See 2 PEIRCE, *supra* note 157, ¶ 623.

167. See LAMB, *supra* note 159, at 66, 74-76.

168. "Abduction" and "retroduction" are terms that both Peirce and Hanson appear to have used interchangeably. See ANDERSON, *supra* note 154, at 13; HANSON, *supra* note 147, at 85; ANDERSON *supra* note 155. It has, however, occasionally been suggested that the terms can be differentiated. See Tillers & Schuman, *supra* note 121, at 989-90.

169. See HANSON, *supra* note 147, at 87 ("Perceiving the pattern in phenomena is central to their being 'explicable as a matter of course'" in the abductive process); LAMB, *supra* note 159, at 75-76.

170. HANSON, *supra* note 147, at 90. In reaching this conclusion Hanson built directly upon a foundation laid by Peirce, who wrote that when confronted with a surprising phenomenon, an abductive reasoner "looks over its features and notices some remarkable character or relation among them, which he at once recognizes as being characteristic of some conception with which his mind is already stored, so that a theory is suggested which would *explain* . . . that which is surprising in the phenomenon." 2 PEIRCE, *supra* note 157, ¶ 776.

171. See HANSON, *supra* note 147, at 86. Peirce had earlier come to the similar conclusion that the abductive suggestion of an hypothesis and a perceptual judgment (interpreting, for example, a visual pattern) amount substantially to the same thing. See 5 PEIRCE, *supra* note 157, ¶¶ 181-186.

172. See HANSON, *supra* note 147, at 86-90.

173. *Id.* at 87.

Thomas Kuhn, known especially for his famous work on the structure of revolutions in scientific thought,¹⁷⁴ also addressed the thought processes involved when the human mind encounters, and forms initial hypotheses about, novel factual data. As a starting point, he shared with Peirce and Hanson (and others) the conviction that factual hypotheses are not generated through inductive or deductive logic at all; rather, he regarded theories about facts as "imaginative posits, invented in one piece."¹⁷⁵ Kuhn argued that when novel data are encountered, the mind does not typically draw conclusions about the data by the analytical application of abstract rules. Rather, doing concrete problems of this sort much more nearly "resembles the child's puzzle in which one is asked to find the animal shapes or faces hidden in the drawing of shrubbery or clouds. The child seeks forms that are like those of the animals or faces he knows."¹⁷⁶ The assessment of data is made without the need for recourse to rules, generalizations, or even a single criterion for identification: the data is processed through a "primitive perception of similarity and difference" not mediated by abstraction.¹⁷⁷

These accounts of hypothesis generation, from Peirce to Hanson to Kuhn, describe a process of mind that, like the perceptual discovery of patterns in a visual array,¹⁷⁸ bears the telltale features of nonanalytical thought. It is a process that employs a variety of logic that is neither inductive nor deductive in nature.¹⁷⁹ Abductive logic, the logic of hypothesis generation, is instead a logic of possibilities, not certainties; a logic of the

174. See KUHN, *supra* note 147.

175. The quoted language follows this strong expression of his position: "[N]either Sir Karl [Popper] nor I is an inductivist. We do not believe that there are rules for inducing correct theories from facts, or even that theories, correct or incorrect, are induced at all." THOMAS S. KUHN, *Logic of Discovery or Psychology of Research*, in THE ESSENTIAL TENSION 266, 279 (1977). Other philosophers who, with Peirce, Hanson, Kuhn and Popper, hold the view that neither inductive nor deductive reasoning produces initial hypotheses include Polanyi and Feyerabend. See LAMB, *supra* note 159, at 40-47.

176. THOMAS S. KUHN, *Second Thoughts on Paradigms*, in THE ESSENTIAL TENSION, *supra* note 176, at 293, 307.

177. See *id.* at 312. This perception of similarity is, as Kuhn noted, "both logically and psychologically prior to any of the numerous criteria by which that same identification of similarity might have been made. . . . The mental or visual set acquired while learning to see two problems as similar can be applied directly." *Id.* at 308.

178. See *supra* notes 148-50 and accompanying text.

179. See *supra* notes 157, 172, 175 and accompanying text.

potential, not of the actual.¹⁸⁰ It draws upon the imagination,¹⁸¹ and especially upon those aspects of the imagination that allow the mind to reconstruct a plausible whole from an incomplete set of fragments and to discover a familiar pattern hidden in a complex array of data.¹⁸² The actual discovery of an hypothesis, moreover, tends to occur in "a flash"¹⁸³ (although the period of fact-gathering and other preparation may be extended),¹⁸⁴ and as a "conceptual Gestalt."¹⁸⁵ In all these respects, it appears that the close analogy between the perceptual and conceptual processes of discovery holds true,¹⁸⁶ and that both depend principally upon a style of thought that is distinctively nonanalytical in nature.¹⁸⁷

Thus, when a lawyer faces the essential task of generating factual hypotheses to account for an incomplete constellation of preliminary evidence, it seems to be a task that must be performed, at least in substantial measure, by nonanalytical thought processes.¹⁸⁸ The power to generate preliminary factual hypothe-

180. See ANDERSON, *supra* note 154, at 15; *supra* note 161 and accompanying text.

181. See 1 PEIRCE, *supra* note 157, ¶ 46 ("[A man] can stare stupidly at phenomena; but in the absence of imagination they will not connect themselves together in any rational way.").

182. See *supra* text accompanying notes 167-73, 176-77. The experimental evidence indicates that these related processes of completion and pattern-recognition are mediated primarily by the brain's right hemisphere. See *supra* notes 65-66 and accompanying text.

183. See *supra* text accompanying note 165. In conceptualizations of the stages of the creative process, including those proposed by Helmholtz, Poincare, Getzels, and Kneller, the phase of discovery or "illumination" is almost always described as very brief. See EDWARDS, *supra* note 142, at 4; see also Arthur Koestler, *The Three Domains of Creativity*, in *THE CONCEPT OF CREATIVITY IN SCIENCE AND ART* 1, 4 (Denis Dutton & Michael Krausz eds., 1981) ("Gestalt psychologists have coined a word for that moment of truth, the flash of illumination, when bits of the puzzle suddenly click into place. They call it the *Aha* experience. One may regard it as a synonym for the 'Eureka!' cry [of Archimedes: 'I have found it!']."). The characteristic suddenness of the discovery phase suggests that it is based upon simultaneous (rather than serial) processing of information, a feature of nonanalytical thought. See *supra* text accompanying notes 68-69.

184. A number of creativity theorists have suggested that the moment of discovery in the creative process is typically preceded by one or more preparatory stages of variable length. See EDWARDS, *supra* note 142, at 3-4.

185. See *supra* text accompanying notes 170, 175.

186. See *supra* text accompanying notes 148-50, 171, 176.

187. See *supra* notes 63-69, 150 and accompanying text.

188. This conclusion depends, of course, upon the notion that hypothesis generation in the practice of law differs in context, but not fundamentally in kind, from hypothesis generation in science and other disciplines that must engage in the interpretation of facts. It is a notion with both strong intuitive appeal and

ses therefore joins the power to read emotion,¹⁸⁹ and the power to master information in the narrative form,¹⁹⁰ as a special strength of the lawyer's left hand.

That is not to say, however, that the overall process of case investigation is not an enterprise which depends, in a critical way, upon the analytical talents of the lawyer's right hand as well. Indeed, close analysis of existing preliminary evidence, especially through careful evidence-marshalling systems, can provide an important preparatory foundation for the creative generation of factual hypotheses:¹⁹¹ analysis can function as a springboard to the imagination. Moreover, hypothesis generation must typically be followed by methodical hypothesis testing,¹⁹² a process that draws considerably, though not exclusively, upon the analytical apparatus of the mind.¹⁹³ In this fashion, "the antic activities of the left hand offer gifts to the right for closer scrutiny and hardnosed testing."¹⁹⁴

significant support in the legal literature. See, e.g., ANDERSON & TWINING, *supra* note 139, at 84; Calhoun, *supra* note 15, at 510; Tillers & Schuman, *supra* note 121, at 944.

189. See *supra* Part II.B.

190. See *supra* Part II.C.

191. See Tillers & Schuman, *supra* note 121, at 953 ("A major purpose of marshalling strategies in investigation—at least in the preliminary phases of investigation—is the stimulation of useful questions or hypotheses."). The authors describe a set of 12 separate systems for marshalling evidence. See *id.* at 944; cf. BINDER & BERGMAN, *supra* note 15, at 34-40 (describing a set of five evidence-marshalling outlines, three of which are designed to analyze existing evidence).

192. See COVINGTON, *supra* note 142, at 145; Schum, *supra* note 143, at 833; Tillers & Schuman, *supra* note 121, at 962.

193. See Schum, *supra* note 143, at 839-40; Tillers & Schuman, *supra* note 121, at 985. "If [abduction and induction] are different, we might simply characterize discovery as the creative process of generating hypotheses from which relevant evidentiary tests are subsequently deduced, and then characterize proof as the inductive process of grading the likelihood of our hypotheses in light of evidence we obtain." Schum, *supra* note 143, at 839. Schum goes on to point out, however, that "[i]t seems that any such characterization would be inappropriate if it implied that there were no room for imaginative thought in devising and conducting evidentiary tests of hypotheses." *Id.* One essential aspect of devising evidentiary tests of hypotheses that requires imaginative thought, for example, is the generation of secondary hypotheses about what unknown evidence might exist were a hypothesis true. See ANDERSON & TWINING, *supra* note 139, at 84; BINDER & BERGMAN, *supra* note 15, at 190-91; Tillers & Schuman, *supra* note 121, at 990. It has also been suggested that gestalt pattern-recognition is a common, though tenuous, method for proving a hypothesis, quite apart from its value in generating hypotheses. See COVINGTON, *supra* note 142, at 145.

194. BRUNER, *supra* note 1, at xi.

In the creative process of legal case-building, like other forms of the creative process,¹⁹⁵ it therefore appears that there is an important, reciprocal relationship between the work of the left hand and that of the right.¹⁹⁶ Art travels with science on the road to discovery.

CONCLUSION

This article has divided the realm of legal thought into two grand domains—domains ruled symbolically by the lawyer's left and right hands, and corresponding to what science has revealed to be a fundamental, organically-based division in the way humans process information. One of these domains, the "right-handed" domain of analytical thought, is well-mapped, often explored, and universally acknowledged. The other, the "left-handed" domain of nonanalytical thought processes, is a largely uncharted and certainly a less celebrated aspect of the legal mind.

As we have seen, however, nonanalytical thought processes play a crucial role in some of the most important tasks of the practicing lawyer. These include the reading of emotion, the management of information in a narrative form, and the creative

195. It has been suggested that the legal problem-solving process and the creative process itself are but two branches of the same tree, with structures that are essentially identical. See Richard K. Neumann, Jr., *A Preliminary Inquiry into the Art of Critique*, 40 HASTINGS L.J. 725, 744-48 (1989). Neumann identifies these stages in each process: (1) recognition, (2) preparation, (3) option generation, (4) option evaluation, and (5) decision. See *id.*; see also RICHARD K. NEUMANN, JR., *LEGAL REASONING AND LEGAL WRITING: STRUCTURE, STRATEGY, AND STYLE* 239 (2d ed. 1994) (changing the names assigned to some of the stages and adding a sixth stage of "action").

196. See E. Paul Torrance, *Hemisphericity and Creative Functioning*, 15 J. RES. & DEV. EDUC. 29, 36 (1982) ("Almost all serious scholars of creative functioning have recognized the importance of two kinds of information processing which seem to parallel the specialized cerebral functions of the left and right hemispheres."). The entire creative process, in fact, has very frequently been described as one in which there is an alternating shift between analytical and nonanalytical mental processes, and, specifically, an alternating shift between the functions of the left and right hemispheres of the brain. See, e.g., EDWARDS, *supra* note 142, at 42-47; John Curtis Gowan, *The Production of Creativity Through Right Hemisphere Imagery*, 13 J. CREATIVE BEHAV. 39, 48-49 (1979); Albert N. Katz, *Creativity and the Right Cerebral Hemisphere: Towards a Physiologically Based Theory of Creativity*, 12 J. CREATIVE BEHAV. 253, 262 (1978); John T. Myers, *Hemisphericity Research: An Overview With Some Implications for Problem Solving*, 16 J. CREATIVE BEHAV. 197, 201-05 (1982); Ron Rubenzer, *The Role of the Right Hemisphere in Learning & Creativity: Implications for Enhancing Problem Solving Ability*, 23 GIFTED CHILD Q. 78, 86-87 (1979); Torrance, *supra*, at 29.

generation of factual hypotheses. So ubiquitous are these tasks in the practice of law that it is fair to say that the lawyer's left hand reaches symbolically across the span of the lawyer's work, from the office, to the conference room, to the courtroom door.

There is an irony in any use of science to defend the importance of art; in any use of language to describe processes of mind that work largely in silence; and, certainly, in any attempt to analyze the nonanalytical. It is a natural irony, however, that has its root in the special power of science, language, and analysis to explain and justify. This power extends even to matters that themselves have more to do with art than with science, more to do with vision than with speech, and more to do with the perception of a whole than with the dissection of its parts. The right hand gives voice to (and therefore often takes credit for) the silent discoveries and perceptions of the left.¹⁹⁷ It is perhaps for this very reason that the fingerprints of the lawyer's left hand have for so long remained an invisible, though an immensely significant, presence in the product of the lawyer's work.

"But which is the stone that supports the bridge?" Kublai Khan asks.

"The bridge is not supported by one stone or another," Marco answers, "but by the line of the arch that they form."

Kublai Khan remains silent, reflecting. Then he adds: "Why do you speak to me of the stones? It is only the arch that matters to me."

Polo answers: "Without stones there is no arch."¹⁹⁸



197. See CARL SAGAN, *THE DRAGONS OF EDEN* 183 (1977):

Major scientific insights are characteristically intuitive, and equally characteristically described in scientific papers by linear analytical arguments. There is no anomaly in this: it is, rather, just as it should be. The creative act has major right-hemisphere components. But arguments on the validity of the result are largely left-hemisphere functions.

Id.

198. ITALO CALVINO, *INVISIBLE CITIES* 82 (William Weaver trans., Harcourt Brace Jovanovich 1972).