

BEYOND JURISPRUDENCE

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I. INTRODUCTION

The natural world is a system of interdependent systems. These complex systems extend from the darkest recesses of space to the deepest reaches of the quantum realm. As the physician-astronomer team of Karel and Iris Schrijver recently explained, “all processes on the Earth are directly connected to those in our solar system, to our Galaxy, and to the universe beyond.”¹ Earth’s conjoined cycles of water, nitrogen, oxygen, and carbon link all living and nonliving things.² Bio-geo-chemical systems create feedback loops that influence Earth’s atmosphere, environment, and climate.³ These loops spawn ecosystems of animals, plants, fungi, bacteria, and archaea.⁴ Such biological systems produce and support human beings, whose constituent life systems synchronize for survival.⁵ Because these bodily networks are composed of natural elements forged from massive starbursts,⁶ mankind is inexorably enmeshed in the universal super-system. In fact, according to the Schrijvers, “the components of our bodies connect

* Professor of Law, Southwestern Law School. This article seeks to blend jurisprudence with knowledge from the natural sciences, the social sciences, and other humanities. Although extremely daunting, this task was eased by the growing ranks of pioneers who have dared to cross scholastic frontiers to advance the cause of consilience. Because there are too many of these progressive thinkers to acknowledge individually, I would like to commend to the reader the many works repeatedly cited in the notes that follow. From these invaluable contributions, I must give special recognition to Antonio Damasio, David Eagleman, Michael Gazzaniga, Jonathan Haidt, J.A. Scott Kelso and David A. Engström, Karel and Iris Schrijver, and E.O. Wilson, whose compelling ideas and engaging prose helped to inspire much of what appears in these pages. Of course, any errors in interpretation, exposition, and synthesis are mine alone. I also must thank Dov Waisman for his many insightful questions, comments, and suggestions. On the editorial side, Ann McAdam and the staff at the *Southern California Interdisciplinary Law Journal* deserve a special nod of appreciation for doing such a thorough and professional job on a project so unreasonably complex. Finally, I would like to credit the capable research assistance of Matthew Edwards, Michael Ferral, Tina Robinson and the generous financial assistance of Southwestern Law School, for helping to bring this piece to fruition.

¹ KAREL SCHRIJVER & IRIS SCHRIJVER, *LIVING WITH THE STARS: HOW THE HUMAN BODY IS CONNECTED TO THE LIFE CYCLES OF THE EARTH, THE PLANETS, AND THE STARS* 8 (2015).

² *Id.* at 99.

³ *Id.* at 103.

⁴ *Id.* at 195.

⁵ *Id.* at 2, 194.

⁶ *Id.* at 1.

us to the plants and animals around us, bacteria within us, to volcanism, comets, cosmic rays, and to the Sun's light, all the way to the birth and death throes of stars throughout the Galaxy and to the beginning of the universe itself."⁷

Do these systemic connections suddenly end inside the human body, or do they extend to the human mind, human behavior, human culture, and all the way to human institutions like law? I hold the second view, and in the pages that follow, will try to show why. In making this case, I certainly hope to take systems theory into previously uncharted territory. But this move has larger, disruptive consequences. Rather than simply nudge legal theory, it stands to change the very ways we imagine, study, understand, and explain law. Indeed, if law really is a complex natural system, this finding does not just challenge certain theories of law; it strikes at the very foundations of jurisprudence itself.

Conventional jurisprudence ignores the vast systemic latticework that surrounds and sustains us. Convinced of law's exceptionalism, legal theorists assume an alternate reality—one that *separates* man *from* nature in apparent *defiance* of the natural order. Under this view, the world consists of natural kinds and human kinds.⁸ Natural kinds exist in nature without human intervention.⁹ Because their properties are naturally determined, these things have fixed and enduring essences.¹⁰ Human kinds, by contrast, are created exclusively by human thought and action.¹¹ These artifacts are shaped by reason and not by natural forces.¹² Since man enjoys free will, people often change human kinds to suit their wants and needs.¹³

Jurisprudence's dualist perspective does not help clarify law's nature. Instead, it only breeds competition, contradiction, and confusion. For example, natural law scholars say law is a natural-kind constellation of timeless, universal principles.¹⁴ Though human beings can discover the natural law, they cannot create, change, or justify it.¹⁵ Legal positivists, by contrast, believe law is a human kind "posited" through man's will, which operates independently of Mother Nature or some ethereal higher power.¹⁶ While social theorists side with the positivists, they believe legal regimes

⁷ *Id.* at 192.

⁸ See Luka Burazin, *Can There be an Artifact Theory of Law?*, 29 *RATIO JURIS* 385, 386 (2016) (explaining this distinction).

⁹ *Id.*

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

¹⁴ See Kent Greenawalt, *How Persuasive is Natural Law Theory?*, 75 *NOTRE DAME L. REV.* 1647, 1650-51 (2000) (examining natural law theory).

¹⁵ *See id.*

¹⁶ See Anthony J. Sebok, *Misunderstanding Positivism*, 93 *MICH. L. REV.* 2054, 2063-65 (1995) (explaining classical positivism). Ironically, though positivists maintain that law's content is variable, many believe its structural features remain constant across time, place, species, and planets. See SCOTT J. SHAPIRO, *LEGALITY* 406-07 n.16 (2011) (noting that a conception of law must account for both human and nonhuman legal systems, including possible alien forms of law).

develop from changing social conditions and not from sovereign commands or lawmaking conventions.¹⁷

This theoretical battle line creates equally troubling methodological problems. In fact, it forces legal investigators to reject or avoid most forms of human knowledge. Dualism assumes not only the *severance* of mind from matter, but also the *superiority* of mind over matter. Indeed, for many theorists, the mind's rationality provides an exclusive means of exploring metaphysical and conceptual questions.¹⁸ Historically, this faction of naturalists and positivists has embraced analytic philosophy and disregarded *all* the sciences.¹⁹ Though many analysts now consult the social sciences, their ventures look more like convenient coalitions than genuine attempts at synthesis.²⁰ Social theorists are biased too, only in reverse. They rely predominantly on sociological studies and have little use for armchair philosophy.²¹ Yet the combatants do agree on one thing: the "lower" natural sciences offer little to no insight into our loftiest human institutions. Given the presumed chasm between biology and legality, jurists routinely look down on bottom-up theorizing.

Such skepticism was epitomized by the late Ronald Dworkin, perhaps "the most important legal philosopher of our time."²² Dworkin once quipped that "it is hard to see what use" science could have in jurisprudence.²³

¹⁷ See Brian Z. Tamanaha, *The Third Pillar of Jurisprudence: Social Legal Theory*, 56 WM. & MARY L. REV. 2235, 2241-66 (2015) (describing social theory). See generally WILLIAM TWINING, *GENERAL JURISPRUDENCE: UNDERSTANDING LAW FROM A GLOBAL PERSPECTIVE* (2009) (adopting and applying a theory of sociological jurisprudence); Dan Priel, *Two Models of General Jurisprudence*, 4 TRANSNAT'L L. THEORY 512 (2013) (describing and critiquing sociological theories). Social theory's view that law is shaped by social forces competes with various positivist accounts. Some positivists describe (or at least historically have described) law as authoritative commands backed by sanctions. See Sebok, *supra* note 16, at 2063-65 (discussing the command theory of positivism espoused by philosophers Jeremy Bentham and John Austin); Phillip Soper, *Making Sense of Modern Jurisprudence: The Paradox of Positivism and the Challenge for Natural Law*, 22 CREIGHTON L. REV. 67, 76 (1988) (focusing on Austin's coercive positivism). Others positivists say law arises from the shared cooperative activities of lawmakers. See JULES L. COLEMAN, *THE PRACTICE OF PRINCIPLE* 96-99, 152-53 (2001) (endorsing this view).

¹⁸ See SHAPIRO, *supra* note 16, at 13-15 (relying on self-evident, ratiocinative truisms to discover the nature of law).

¹⁹ See *id.* at 406-07 n.16 (implicitly rejecting the natural sciences because law is not a natural kind and openly rejecting the social sciences because they study only human societies). See also H.L.A. HART, *ESSAYS IN JURISPRUDENCE AND PHILOSOPHY* 13 (1983) (describing the methodology of the social sciences as "useless" to jurisprudence).

²⁰ In most cases, legal philosophers or philosophically minded legal theorists have borrowed insights from select disciplines like moral or political theory, economics, history, sociology, or psychology and incrementally incorporated them into the old analytic framework. See, FREDERICK SCHAUER, *THE FORCE OF LAW* (2015) (adding sociology, economics, and cognitive psychology); Mark Greenberg, *The Moral Impact Theory of Law*, 123 YALE L.J. 1288 (2014) (adding morality); Nicola Lacey, *Jurisprudence, History, and the Institutional Quality of Law*, 101 VA. L. REV. 919 (2015) (adding history); Gerald J. Postema, *Jurisprudence, The Sociable Science*, 101 VA. L. REV. 869 (2015) (adding history); Dan Priel, *Jurisprudence and Psychology*, in *NEW WAVES IN PHILOSOPHY OF LAW* 77 (Maksymilian del Mar ed., 2011) (adding psychology); Joshua D. Wright & Douglas H. Ginsburg, *Behavioral Law and Economics: Its Origins, Fatal Flaws, and Implications for Liberty*, 106 NW. L. REV. 1033 (2012) (adding psychology to economics).

²¹ See Tamanaha, *supra* note 17, at 2266-75 (elaborating this view).

²² Cass R. Sunstein, *The Most Important Legal Philosopher of Our Time*, BLOOMBERG VIEW (Feb. 15, 2013, 6:14 PM), <https://www.bloomberg.com/view/articles/2013-02-15/the-most-important-legal-philosopher-of-our-time> (making this assertion in the essay's title but tempering it slightly in the text).

²³ Ronald Dworkin, *Thirty Years On*, 115 HARV. L. REV. 1655, 1681 (2002) (book review).

Turning first to the social sciences, Dworkin asked, “How could induction from a thousand very different cases of legal institutions, and from the varying motives and assumptions of thousands of actors in different times and places, reveal the ‘essence’ or ‘very nature’ of law’s structure?”²⁴ Believing such revelation impossible, he immediately pivoted to the natural sciences. Dworkin acknowledged that atoms and animal DNA could have inherent physical structures, but categorically declared that “there is nothing comparable about a complex social practice” like law.²⁵ “Where,” Dworkin challenged, “should we look for its ‘essence’ or nature?”²⁶

The answer, it turns out, is everywhere. To comprehend the nature of law, we must grasp the complex natural systems that inform and transform it. For this to occur, jurists first must abandon dualism, embrace holism, and expand their methods of investigation. Instead of choosing between philosophy *or* science, they must practice consilience.

Consilience is the integration of knowledge across *all* academic disciplines.²⁷ By way of analogy, think of the human species as a seedling that grows into a tree—call it the Tree of Knowledge.²⁸ Like the tree, human beings have grown in complexity throughout the course of their evolution, taking root as semi-autonomous neurobiological *organisms*, then branching into cooperative coalitions or *societies*, and finally sprouting more diverse and fine-grained belief systems or *cultures*.²⁹ Throughout history, man has created domains of knowledge to comprehend each of his own developmental phases, with the *natural or life sciences* corresponding to the first, the *social sciences* corresponding to the second, and the *humanities* corresponding to the third.³⁰ Neither the life phases nor their accompanying knowledge domains are truly separate and distinct. Despite their apparent differences, the stages in this cycle of humanity are coherent, interdependent, and mutually reinforcing. Just as a leaf cannot be understood apart from the chemical processes of the tree, law cannot be understood apart from the complex systems that brought it into being.³¹

With consilience’s insights, these systemic forces quickly snap into sharp focus. We finally see that law is the culmination of three natural phenomena: *complexity, complementarity, and coordination dynamics*. Like other natural

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

²⁷ Consilience advocate, Edward O. Wilson, defines the term as the “‘jumping together’ of knowledge by the linking of facts and fact-based theory across disciplines to create a common groundwork of explanation.” EDWARD O. WILSON, CONSILIENCE: THE UNITY OF KNOWLEDGE 8 (1998). Consilience will be discussed more fully in Section II.A.

²⁸ See Gregg Henriques, *The Tree of Knowledge System and the Theoretical Unification of Psychology*, 7 REV. GEN. PSYCH. 150, 153-56 (2003).

²⁹ See *id.* at 153-55.

³⁰ *Id.* at 155.

³¹ Notice that today’s dualist jurisprudence is incapable of consilience. Analytic philosophers sit atop the Tree of Knowledge with their eyes wide shut, contemplating the tree’s true nature without ever looking down. Social scientists sit perched at the tree’s middle looking outward, describing in vivid detail the unique characteristics of its extended branches, but turning a blind eye to everything above and below. By assuming such a selective and blinkered perspective, both groups not only lack sufficient evidence to discover the full truth, they cannot help but mistake the parts for the whole. The result is two decidedly distorted and discordant images of the same phenomenon.

systems, law emerges from layers of systematic interaction. This complex tree of causality has *biological* roots. Complex *genetic* and *neural* systems create instincts of selfishness and sociality. These systems spawn *psychological* systems that stimulate feelings of fear, anger, empathy, and trust. Over time, these systems foment hierarchies and reciprocal exchanges, which generate complex *social* systems of cooperation. As groups proliferate and diversify, these partisan practices eventually give rise to shared *cultural* systems, including our objective system of law. Yet, the cycle of legality never really ends. According to complexity theory, system pressures operate both within and between man's developmental tiers, triggering attitudinal and behavioral changes that run not only from individuals up to societies and cultures, but also back down into the human genome. In this way, law is both permanently grounded in human nature, and constantly adapting to social and cultural progress.

These interconnected systems serve a coordinative function. Though human beings seek self-preservation, they possess complementary but conflicting properties that jeopardize their survival. We have propensities for helping and harming, fairness and cheating, loyalty and betrayal, autonomy and oppression, obedience and subversion, and sanctity and degradation. These "complementarities" create an illusion of incompatible choices; in fact, the very dualistic illusion that now divides our jurisprudence.³² Though such polar extremes are hardwired into our brains, they are not isolated or fixed states of being. Rather, they are merely the volatile boundaries to the mind's fluid exploration of a stunning array of possibilities. This cognitive system—like every other natural network—reconciles competing positions through a perpetual process of recalibration that emphasizes their instability and connection and explores the gray areas in between.

So it is with law. Animated by the same coordination dynamics, our biological systems coordinate our bodily functions and psychological drives, while our social and cultural systems coordinate our relationships with other people. As a cultural institution, our legal system stands above the masses, stabilizing the persistent social discord below. But law never loses its human footing. In fact, law is really just the mirror image of its human creator—a complementary collection of problem-solving systems dynamically coordinating and reconciling their antagonistic tendencies in pursuit of survival and flourishing. In cells, brains, bodies, societies, economies, cultures, and yes, even legal systems, coordination dynamics is the natural mechanism for mediating our schizophrenic human condition.

Of course, this explanation is not the only legal theory to see law as coordinative. Past efforts have described coordination as one of law's key

³² A complementarity is two or more things that appear contradictory and incompatible but actually are complementary pieces of a unified whole. See J.A. SCOTT KELSO & DAVID A. ENGSTRÖM, *THE COMPLEMENTARY NATURE* 3, 35 (2006). This concept will be discussed more fully in Section II.B.1.

functions.³³ if not the institution's primary *purpose*.³⁴ However, it *is* the first theory to attribute law's *nature* to complexity *and* coordination dynamics. Besides illuminating law's functions, this dynamic theory helps to explain where law comes from, how it develops, what forms it takes, and what processes it uses. More importantly, by portraying law as a projection of its creator, a naturalized approach ultimately comes closer to revealing the law's inner humanity.

In sum, this quantum leap beyond jurisprudence toward "jurisilience"³⁵ promises to explain both the human nature of law and the theories of jurisprudence humans use to describe it. Despite its ambition, however, such a bold program requires some circumspection. Certain limits are simply intrinsic to the enterprise. No single individual can accomplish consilience. It takes the tireless commitment of many creative minds with vastly different forms of expertise working collaboratively over long periods of time. Thus, I will not attempt to provide a complete and comprehensive treatment of the subject; nor will I offer definitive "proof" of its merits. Indeed, given time and space constraints, I cannot address all of the disciplines relevant to legal theory. Instead, I will present a general outline of my approach and adduce enough evidence to support its framework. Because conventional jurisprudence already includes knowledge from the humanities, I will begin with the natural sciences and transition into the social sciences. In appearance and effect, the process will resemble the first stages of the scientific method, where initial observations are used to develop an educated hypothesis of the observed phenomenon. The real empirical work of proving the hypothesis will have to wait.

Other qualifications to this project are more prudential. While my treatment may have many practical ramifications, it is not offered for any instrumental purpose or to advance any political agenda.³⁶ Unlike some other science-based projects, this theory is not designed to effect any specific legal change—like promoting lie detection tactics or creating defenses for criminal behavior.³⁷ Its only goal is to discover the truth. On that score, it

³³ Legal scholars of every persuasion seem to recognize coordination as one of the law's important functions. *See, e.g.*, JOHN FINNIS, NATURAL LAW AND NATURAL RIGHTS 231-33 (1980) (presenting a theory of natural law); GERALD J. POSTEMA, LEGAL PHILOSOPHY IN THE TWENTIETH CENTURY: THE COMMON LAW WORLD 564-66 (11 A TREATISE OF LEGAL PHILOSOPHY AND GENERAL JURISPRUDENCE, et al. eds., 2011) (discussing Jeremy Waldron's political jurisprudence); Brian Z. Tamanaha, *Insights About the Nature of Law from History* 6 (Wash. Univ. in St. Louis Leg. Stud. Res. Paper No. 14-05-08, 2014), <http://ssrn.com/abstract=2441256> [<https://perma.cc/5DX6-BYQN>] (taking a socio-historical perspective).

³⁴ *See generally* RICHARD H. MCADAMS, THE EXPRESSIVE POWERS OF LAW: THEORIES AND LIMITS (2015) (arguing that social coordination is a central purpose of law); SHAPIRO, *supra* note 16 (presenting a theory of law as coordinative social planning). Both of these works are discussed more fully in Section V.C.2 of this article.

³⁵ Jurisilience is a portmanteau combining jurisprudence, the study of law, and consilience, the unification of knowledge. As the name suggests, this new approach seeks to enrich the study of law with knowledge from the natural sciences, the social sciences, and other humanities.

³⁶ *See generally* Owen D. Jones & Matthew Ginther, *Law and Neuroscience*, in 13 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL & BEHAVIORAL SCIENCES 489 (2d ed. 2015) (describing the instrumental uses of neuroscience in law).

³⁷ *See* MICHAEL S. PARDO & DENNIS PATTERSON, MINDS, BRAINS, AND LAW: THE CONCEPTUAL FOUNDATIONS OF LAW AND NEUROSCIENCE 79-82, 121, 179-83 (2013) (addressing the use of neuroscience research in these and other ways).

does not find absolute truth in any “natural” source like neuroscience or evolutionary biology, though these fields are certainly enlightening. It also does not prioritize scholarly departments or replace some information domains with others. The very essence of this holistic theory is that it has no deterministic, static essence. Rather, it is a dynamic fusion of disparate narrative threads into a compelling tale of our basic human law instinct.

With these disclaimers in mind, the article’s narrative will unfold in a consilient arc. Having exposed the competitive dualism of modern jurisprudence, Part II explores some natural modes of unification and reconciliation—including the systemic notions of consilience, complementarity, complexity, and coordination dynamics. The next two Parts weave these insights up through the Tree of Knowledge, with Part III linking the natural sciences of evolutionary biology and neuroscience, and Part IV connecting these branches to the social sciences of moral and developmental psychology, sociology, and anthropology. Though just a rough sketch, this survey of “jurisilience” depicts humans as inherently competitive beings with an incessant need and evolved capacity to resolve their inner conflicts, just as they settle their external conflicts with other people and groups. Part V extends the investigation from jurisilience to jurisilience, where it examines our chief conflict control mechanism: law. Completing our systemic profile, this closing discussion shows how a coordinative approach can help explain the etiology of law and legal systems, clarify crucial aspects of their structure and content, and illuminate and reconcile our conflicting theories of jurisprudence. The article concludes by considering the potential impact and future direction of this exciting new theory.

II. UNIFICATION AND RECONCILIATION

Like jurisprudence, jurisilience offers both a method for investigating law and a theory to explain it. Yet, jurisilience is not strictly jurisprudential. Beneath its legal usage, this holistic approach is an ecumenical process for understanding natural systems. That process consists of consilience, complementarity, complexity, and coordination dynamics. While consilience unifies our knowledge of the truth, complementarity unifies our concept of reality, exposing its polar interdependence. Bridging the two, complexity and coordination dynamics unify knowledge and reality by constantly reconciling our competing streams of cognition and information. Together, these potent forces affect all aspects of human nature—from bodies, brains, and behaviors to economies, cultures, and institutions.³⁸ Because law is the natural culmination of these complex systems, consilience, complementarity, complexity, and coordination dynamics do not just inform our legal concepts and practices; they define the very nature of law itself. Thus, to truly grasp legal systems, we must embrace systems theory; and to do this, we first must study each of its natural elements.

³⁸ See KELSO & ENGSTRØM, *supra* note 32, at 85, 89.

A. CONSILIENCE

1. *Two Cultures*

For most of the modern era, our knowledge of the world has been broken into little bits of information.³⁹ Those bits have not been stored in the same place, examined by the same people, or cross-assembled into larger categories of wisdom. Instead, they have been distinguished by their differences and filed away into separate classification files, where they have been reviewed by different people with different types of expertise. Despite their shared veridical aspirations, these experts traditionally have not worked in tandem, and even when they have, their collaborations typically have been episodic and issue-specific.

This hegemonic approach to knowledge emerged around the turn of the twentieth century.⁴⁰ Up to that time, most of what we knew about the world was gleaned through the speculative ruminations of natural philosophy.⁴¹ But by the closing decades of the nineteenth century, philosophy had begun to splinter into separate disciplines of logic, ethics, epistemology, and metaphysics.⁴² As this specialization trend evolved, a new scientific spirit swept through the academy. Before long, scholars studying old philosophical topics like physics and psychology were breaking ranks and joining their science departments.⁴³ These new knowledge-seekers sought truth through empirical investigation and increasingly abandoned intuitive analysis. By 1906, the movement from philosophy to science had progressed so far that one contemporary observer grimly declared: “Philosophy, the sometime queen [and mother science for more than two thousand years], has become a dowager; her children have deserted her, all but a few barren daughters, we are often told, for whom nobody cares.”⁴⁴

This academic falling-out only intensified as the sciences expanded and diversified. In time, the social sciences declared independence from the natural sciences, with the former conducting “soft” qualitative studies and the latter performing “hard” quantitative experiments. While this scientific divide deepened, the chasm between the sciences and the humanities grew wider. In 1959, scientist and author, C.P. Snow, announced that the Western intelligentsia had finally split into “two cultures” with little in common and even less hope of reconciliation.⁴⁵ As Snow explained, the sciences and the humanities were now separated by “a gulf of incomprehension,” filled as much by “hostility and dislike” as by a “lack of understanding.”⁴⁶

Much of this rancor still exists today. In a series of recent exchanges, scientists and philosophers alike have unleashed blistering attacks against

³⁹ See Frank Thilly, *Psychology, Natural Science, and Philosophy*, 15 PHIL. REV. 130, 130 (1906).

⁴⁰ See WILSON, *supra* note 27, at 40-43.

⁴¹ See Thilly, *supra* note 39, at 130.

⁴² *Id.*

⁴³ *Id.* at 130-31.

⁴⁴ *Id.* at 130.

⁴⁵ See C.P. SNOW, THE TWO CULTURES AND THE SCIENTIFIC REVOLUTION 2, 4-5 (1959).

⁴⁶ *Id.* at 4.

the other side.⁴⁷ Scientists say philosophers resent their prodigious funding, celebrated discoveries, and academic prestige.⁴⁸ Philosophers reply that scientists “feel prickly and self-pitying about the humanistic insistence that there is more to the world than science can disclose.”⁴⁹ Upping the rhetoric, scientists describe the humanities as a disorganized and unrigorous collection of disciplines⁵⁰ which, in their postmodern phase, have displayed “defiant obscurantism, dogmatic relativism. . . suffocating political correctness,”⁵¹ and an utter lack of direction or purpose.⁵² Meanwhile, philosophers paint the sciences as “deeply flawed, culturally parochial discourses that threaten human values and dignity.”⁵³

The other source of disagreement between the “two cultures” is far more substantive. In fact, it is founded on one of man’s oldest philosophical conundrums: how to reconcile mind and matter. Traditionally, philosophers have probed their minds to find meaning in human thoughts and actions.⁵⁴ Scientists, by contrast, have made observations of the physical world to explain the material causes of its contents.⁵⁵ To the humanists in particular, these two modes of investigation explore two completely different realms of being.⁵⁶ Though bodies are moved by brains, brains are not minds. Minds rationally create meaning; brains—like all other physical things—merely obey physical laws. According to one early theorist:

⁴⁷ See Edward Slingerland & Mark Collard, *Creating Consilience: Toward a Second Wave*, in *CREATING CONSILIENCE: INTEGRATING THE SCIENCES AND THE HUMANITIES* 3, 35 (Edward Slingerland & Mark Collard eds., 2011) [hereinafter *CREATING CONSILIENCE*] (describing this divide). A collection of exchanges from 2012 through 2013 aptly illustrate the depths of this mutual antagonism. See, e.g., Ross Andersen, *Has Physics Made Philosophy and Religion Obsolete?*, *ATLANTIC* (Apr. 23, 2012), <http://www.theatlantic.com/technology/archive/2012/04/has-physics-made-philosophy-and-religion-obsolete/256203/> [https://perma.cc/Y3JB-DDZH] (presenting an interview with scientist, Lawrence Krauss, who describes philosophy’s weaknesses); Julian Friedland, *Philosophy is Not a Science*, *N.Y. TIMES* (APR. 5, 2012, 8:30 PM), http://opinionator.blogs.nytimes.com/2012/04/05/philosophy-is-not-a-science/?_r=0 [https://perma.cc/5LLF-TK6L] (arguing that philosophic knowledge is more reliable and enduring than scientific knowledge); Austin L. Hughes, *The Folly of Scientism*, 37 *THE NEW ATLANTIS* 32 (2012) (critiquing science and defending philosophy); Philip Kitcher, *The Trouble with Scientism*, *NEW REPUBLIC* (May 3, 2012), <http://www.newrepublic.com/article/books-and-arts/magazine/103086/scientism-humanities-knowledge-theory-everything-arts-science> [https://perma.cc/NSV8-DLYB] (critiquing scientism); Steven Pinker, *Science is Not Your Enemy*, *NEW REPUBLIC* (Aug. 6, 2013), <http://www.newrepublic.com/article/114127/science-not-enemy-humanities> [hereinafter Pinker, *Science is Not Your Enemy*] (defending science and noting the challenges facing the humanities); Leon Wieseltier, *Crimes Against Humanities*, *NEW REPUBLIC* (Sept. 3, 2013), <http://www.newrepublic.com/article/114548/leon-wieseltier-responds-steven-pinkers-scientism> [https://perma.cc/SJ4F-VSYB] [hereinafter Wieseltier, *Crimes*] (critiquing Pinker’s defense of science and promoting philosophy); Steven Pinker & Leon Wieseltier, *Science vs. the Humanities, Round III*, *NEW REPUBLIC* (Sept. 26, 2013), <http://www.newrepublic.com/article/114754/steven-pinker-leon-wieseltier-debate-science-vs-humanities> [https://perma.cc/9AF3-EM6M] (Pinker and Wieseltier exchange a final round of barbs).

⁴⁸ Edward Slingerland, *Mind-Body Dualism and the Two Cultures*, in *CREATING CONSILIENCE*, *supra* note 47, at 81.

⁴⁹ Wieseltier, *Crimes*, *supra* note 47, at 3.

⁵⁰ See Kitcher, *supra* note 47, at 3.

⁵¹ Pinker, *Science is Not Your Enemy*, *supra* note 47, at 9.

⁵² See *id.*; Kitcher, *supra* note 47, at 3.

⁵³ Slingerland & Collard, *supra* note 47, at 35.

⁵⁴ See Slingerland, *supra* note 48, at 74.

⁵⁵ See *id.*

⁵⁶ See *id.*

A perfect knowledge of the physical and physiological counterparts of mind would not give us a knowledge of the mind as such [because] [e]ven if we could tell all about the brain and what takes place inside and outside of it, we should never come face to face with a thought or a feeling in [science], for a thought or a feeling is quite different from a molecular motion in the brain or anywhere else.⁵⁷

Since mind and matter do not mix, philosophers and scientists continue to dispute their relationship.

2. All Is (or Can Be) One

Viewed against this backdrop, the dualism plaguing Anglo-American jurisprudence seems both natural and unavoidable. The analysts gravitate toward philosophy's contemplative approach, while the social theorists are drawn to the empirics of science. Yet these extremes do not exhaust the range of possibilities. Outside legal academia, a different epistemological tradition has endured the span of centuries. This holistic approach sees science and philosophy not as mortal enemies, but rather as compatible partners in the common search for truth.

Labeled "consilience" by nineteenth-century scientist, philosopher, and theologian, William Whewell,⁵⁸ the idea of a unified system of knowledge has a long and venerable history. It began with the ancient Greek Ionian thinker, Thales of Miletus,⁵⁹ and was passed on by Enlightenment scholars like the Marquis de Condorcet and Francis Bacon.⁶⁰ During the early part of the twentieth century, the consilience movement was reinvigorated by an eclectic group of scholars known as logical positivists,⁶¹ who published the *International Encyclopedia of Unified Science* to "illuminate the horizontal and vertical relations that exist among the sciences."⁶²

Consilience reached its modern crescendo in 1998 with the publication of Edward O. Wilson's opus, *Consilience: The Unity of Knowledge*.⁶³ According to Wilson, a biologist, "[t]he ongoing fragmentation of knowledge and resulting chaos in philosophy are not reflections of the real world but artifacts of scholarship."⁶⁴ In reality, there is no fundamental gap between the humanistic study of mankind and the scientific examination of the material world.⁶⁵ Because humans are physical organisms found in nature, they are subject to the same causal principles as other natural

⁵⁷ Thilly, *supra* note 39, at 133.

⁵⁸ See WILLIAM WHEWELL, *THE PHILOSOPHY OF THE INDUCTIVE SCIENCES, FOUNDED UPON THEIR HISTORY*, 203 (London, John W. Parker 2d ed. 1840).

⁵⁹ WILSON, *supra* note 27, at 4-5, 7.

⁶⁰ See *id.* at 15-30.

⁶¹ The logical positivists consisted of an influential group of mathematicians, scientists, and philosophers known as the Vienna Circle. See STEPHEN P. SCHWARTZ, *A BRIEF HISTORY OF ANALYTIC PHILOSOPHY: FROM RUSSELL TO RAWLS* 46-47 (2012) (describing the Circle and some of its members).

⁶² George A. Reisch, *Planning Science: Otto Neurath and the International Encyclopedia of Unified Science*, 27 *BRIT. J. HIST. SCI.* 153, 160 (1994). The first two volumes were not completed until 1970 and no additional volumes have been published since. *Id.* at 175.

⁶³ WILSON, *supra* note 27.

⁶⁴ *Id.* at 8.

⁶⁵ See *id.*

phenomena.⁶⁶ Thus, all knowledge about the human condition is necessarily interconnected, even if the academy historically has said otherwise.

For Wilson, the obvious connection point was science. Over time, science would infiltrate and inform all academic disciplines. In a prescient passage, Wilson suggested that the march toward consilience would unfold in several stages. Initially, the social sciences would continue to split and subdivide into subdisciplines, which would eventually merge with biology on the one hand and the humanities on the other.⁶⁷ As a result, many of the humanities—including philosophy, history, ethics, comparative religion, and art interpretation—would “draw closer to the sciences and partly fuse with them.”⁶⁸ However, Wilson pushed the point to a controversial and predictably off-putting extreme, arguing that the more science helped us understand human nature, the more “[p]hilosophy, the contemplation of the unknown, [would become] a shrinking dominion.”⁶⁹ Endorsing this trend, Wilson even touted the desirability “of turning as much philosophy as possible into science.”⁷⁰

The remaining challenge was to build bridges between and among science’s many specialties. As Wilson forewarned, this could be a monumental task because “validation criteria across disciplines are accordingly vast.”⁷¹ Biologists might rely on direct observation, while biochemists might use duplication and analogy, and experimental physicists might engage in logical deduction.⁷² A consilience practitioner had to master and reconcile all three techniques and more. In Wilson’s view, “The ideal scientist thinks like a poet[,] works like a bookkeeper, . . . and writes like a journalist.”⁷³

Despite its harmonic theme, Wilson’s book drove an even deeper wedge between science and the humanities. Where scientists saw bonding, humanists saw bondage or obliteration. As one commentator observed, Wilsonian consilience “inspired a backlash among humanists of such intensity and duration that it begs explanation.”⁷⁴ Consilience scholars soon sensed that they could not win hearts or minds without taking a more conciliatory approach. So they carefully recrafted their message.

In consilience’s second phase, unification became inclusive, causing many cautious observers to finally join the movement. Their objective was not to turn philosophers into biologists or humanities faculties into science departments.⁷⁵ There would be plenty of room for all academic disciplines in knowledge’s ivory tower.⁷⁶ The goal was to make consilience a two-way

⁶⁶ *See id.*

⁶⁷ *See id.* at 12.

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ *Id.* at 63.

⁷² *See id.*

⁷³ *Id.* at 62.

⁷⁴ Slingerland & Collard, *supra* note 47, at 4.

⁷⁵ *See id.* at 24.

⁷⁶ *See id.* at 36.

street.⁷⁷ As before, humanists would be expected to keep abreast of scientific findings related to their fields, reconcile their views with these existing facts, and collaborate when possible with like-minded scientists.⁷⁸ In this respect, science would continue to serve as an epistemic constraint on humanistic studies.⁷⁹ But science also would take heed of the humanities. Just as the arts must learn from the sciences, the sciences sometimes must defer to humanist expertise. The point of this give-and-take was “not [to] require that humanists or scientists give up or exchange their particular jobs” but rather to empower “all academics [to] do their jobs better.”⁸⁰

3. *Coming Together*

Today, academic consilience appears to be in full swing. Outside the law, scholars from across the knowledge spectrum are increasingly joining forces to tackle some of life’s most perplexing questions. This synergy has two trajectories. Experts from the same knowledge domains have connected horizontally to strengthen and unify their fields. Meanwhile, academics from different disciplines positioned up and down the Knowledge Tree are vertically integrating with each other to create completely new and exciting knowledge domains that expand our conception of reality and everything in it.

Horizontal consilience has proceeded most rapidly in the natural sciences, especially biology.⁸¹ The synthesis in biology began some seventy years ago when evolution theory merged with genetics.⁸² The fusion of biological specialties rapidly increased, eventually linking the fields of evolutionary biology; biochemistry; organismic, cellular, and molecular biology; population genetics; cytology; botany; and ecology.⁸³ By the 1990s, the alliance was so strong biologist Wilson declared that “disciplines within biology itself are now generally consilient and growing more so each year.”⁸⁴ In fact, the same could be said about the natural sciences in general, where “[a] compatibility principle is so taken for granted . . . that it is rarely articulated;” “the natural sciences are understood to be continuous.”⁸⁵

Networking within the social sciences has been less enthusiastic, but is underway and likely to continue. Until recently, anthropologists, sociologists, economists, psychologists, and political scientists rarely read each others’ work, let alone collaborated.⁸⁶ Criticizing this insularity, a team of noted social scientists observed just two decades ago that “the social

⁷⁷ See *id.* at 18, 34.

⁷⁸ See *id.* at 34.

⁷⁹ See *id.* at 36.

⁸⁰ *Id.* at 19.

⁸¹ See WILSON, *supra* note 27, at 89, 90-91.

⁸² See Henriques, *supra* note 28, at 150-51.

⁸³ See *id.* at 151; WILSON, *supra* note 27, at 91.

⁸⁴ WILSON, *supra* note 27, at 89.

⁸⁵ Leda Cosmides et al., *Introduction: Evolutionary Psychology and Conceptual Integration*, in THE ADAPTED MIND: EVOLUTIONARY PSYCHOLOGY AND THE GENERATION OF CULTURE 3, 4 (Jerome H. Barkow et al eds., 1992).

⁸⁶ John Tooby & Leda Cosmides, *The Psychological Foundations of Culture*, in THE ADAPTED MIND: EVOLUTIONARY PSYCHOLOGY AND THE GENERATION OF CULTURE 19, 4, 21-22 (Jerome H. Barkow et al eds., 1992).

sciences are still adrift, with an enormous mass of half-digested observations, a not inconsiderable body of empirical generalizations, and a contradictory stew of ungrounded, middle-level theories expressed in a babel of incommensurate technical lexicons.⁸⁷ That team attributed the malaise to the Standard Social Science Model, the discipline's allegedly outmoded intellectual framework that justified autonomous research while concealing possible points of consilience.⁸⁸ Consequently, the group proposed an alternative Integrated Causal Model that accepts and exploits natural connections between scientific fields.⁸⁹ Though still advisory, the model's unifying spirit is beginning to catch on, especially in the field of psychology.⁹⁰

As consilience expands outward, it also grows vertically along the trunk of the Knowledge Tree, moving toward unity from above and below. Within its philosophic canopy, epistemologists have progressively reached downward to the sciences for inspiration. As one practitioner has observed, "psychologically sophisticated philosophers and philosophically sophisticated psychologists began to use the data and the methods of experimental psychology, neuroscience, cognitive anthropology, evolutionary biology and, more recently, behavioral economics in an attempt to sharpen and resolve traditional issues in moral philosophy."⁹¹ This trend shows few signs of stalling. In fact, one insider confirms its expansion, as "analytic philosophers continue to preoccupy themselves with conceptual problems in history, law, political theory, social science, education, and hosts of other areas" traditionally neglected by philosophy.⁹²

From knowledge's roots in the natural sciences, the unification process has steadily extended upwards into the social sciences. Wilson cites four momentous steps toward their interdisciplinary convergence. First, cognitive neuroscience has infiltrated psychology and spawned the biosocial hybrid of cognitive psychology.⁹³ Second, psychology also has paired with genetics to form the emerging field of behavioral genetics.⁹⁴ Third, evolutionary biology and sociology have teamed up in the crossover specialty of sociobiology.⁹⁵ Finally, the natural and social sciences have contributed to the growing school of environmental sciences which continue to integrate the insights of their progenitors.⁹⁶

The sciences also have reached up to the humanities, instantiating the two-way communication process envisioned by second-phase consilience. Scientists combining the lessons of genetics, linguistics, and archeology already have begun to develop a "deep history" that bridges the latest stages

⁸⁷ *Id.* at 23.

⁸⁸ *See id.*

⁸⁹ *See id.* at 23-24.

⁹⁰ *See* Henriques, *supra* note 28, at 151-52.

⁹¹ Stephen Stich, *We're All Connected: Science, Ethics, and the Law*, in *CREATING CONSILIENCE*, *supra* note 47, at 286.

⁹² T.M. Reed, *Analytic Philosophy in the 20th Century*, 2 AM. LIBR. 1161, 1168 (1971).

⁹³ *See* WILSON, *supra* note 27, at 208-09.

⁹⁴ *See id.* at 209.

⁹⁵ *See id.*

⁹⁶ *See id.*

of human evolution with the historical development of civilization and culture.⁹⁷ Such border crossings continue to proliferate. As Steven Pinker notes:

[T]he philosophy of mind nowadays shades into the sciences of cognition and neurobiology: topics such as consciousness, innate ideas, the mind/body problem, imagery, private language, and epistemology are no longer carried out in a hermetically sealed philosophical discourse but incorporate what we know about the incarnation of all of these processes in living brains. The visual arts and the study of visual perception are also beginning to mutually inform one another. An example is evolutionary aesthetics, and the analysis of why certain colors, forms, faces, and landscapes elicit certain affective and cognitive responses.⁹⁸

This fusion has reached its zenith at the Massachusetts Institute of Technology (M.I.T.), where scientists in research labs regularly collaborate with embedded artists to stimulate their creativity.⁹⁹ In M.I.T.'s view, science and the humanities are not antagonists—they are or can be cooperative partners. As the Schrijvers remind us, “Nature does not respect any of the human attempts to cleanly separate the natural sciences into independent research fields, so that insights often develop across the interfaces between two or more disciplines, and sometimes entirely new fields of science have to be created.”¹⁰⁰ This cross-fertilization not only unifies and expands our knowledge, it also stimulates growth in each connected field. In fact, the more vertical consilience continues, the more apparent it is that the sciences and the humanities actually complete *each other*. To quote Wilson: “Science needs the intuition and metaphorical power of the arts, and the arts need the fresh blood of science.”¹⁰¹

Of course, doubters still remain. Leaving aside professional envy, many humanists resist consilience because of their unyielding belief in the mind-body dualism. Of the moderates who may be more receptive to consilience, a good number question the plausibility of developing uniform epistemic standards across all disciplines. But these challenges, while formidable, are not insurmountable. I will confront the latter concern in future work by attempting to distill some common reliability criteria.¹⁰² For now, I will turn

⁹⁷ Steven Pinker, *The Humanities and Human Nature*, in *CREATING CONSILIENCE*, *supra* note 47, at 46.

⁹⁸ *Id.* at 47.

⁹⁹ See Hilarie M. Sheets, *At M.I.T., Science Embraces a New Chaos Theory: Art*, N.Y. TIMES (March 4, 2016), http://www.nytimes.com/2016/03/06/arts/design/at-mit-science-embraces-a-new-chaos-theory-art.html?_r=0.

¹⁰⁰ SCHRIJVER & SCHRIJVER, *supra* note 1, at 192.

¹⁰¹ WILSON, *supra* note 27, at 230.

¹⁰² A search through our vast knowledge domains reveals a number of uniform criteria for evaluating justificatory arguments. From science to epistemology to rhetoric, the most persuasive narratives tend to be the most reliable, empirical, logical, socially and morally coherent, aesthetically compelling, practical, and not surprisingly, consilient. See WILSON, *supra* note 27, at 58, 64 (listing scientific reliability factors); Alvin I. Goldman, *Epistemic Folkways and Scientific Epistemology*, 3 PHIL. ISSUES 271, 282 (1993) (listing epistemological reliability factors); Christopher Rideout, *Storytelling, Narrative Rationality, and Legal Persuasion*, 14 LEGAL WRITING: J. LEGAL WRITING INST. 53, 56-76 (2008) (listing rhetorical reliability factors). Because consilience coordinates law-related knowledge across disciplines, it appears uniquely suited to create such a pantheoretical assessment standard.

to jurisilience's second component—complementarity—to see how it addresses the dualist conundrum.

B. COMPLEMENTARITY

1. *Contraries are Complementary*¹⁰³

Consilience unites fragments of knowledge to facilitate our understanding and description of the natural world. But it does not reveal the world's true essence. This task belongs to ontology. According to the ontological theory of dualism, reality is composed of two seemingly incompatible and irreducible constituents—mind and matter. Because their differences are fundamental and inexorable, knowledge of one component cannot aid our comprehension of the other. Thus, dualists see no reason to force these facts together and every reason to keep them apart.

Complementarity revises this truth. While it acknowledges the presence—indeed prevalence—of binary oppositions in the world, it reinterprets their relationship. Competitive dyads are not permanent or essential states but dynamic interactive tendencies. What's more, these conflicts are not irreconcilable—contraries are complementary. As a result, beliefs about these phenomena are not incompatible but interrelated, with each piece of knowledge necessary to solving the whole puzzle.

This holistic conception of reality works on various levels. It has been used to explain things small and large—from particle physics to cosmology—and much about life in between.¹⁰⁴ More importantly for our purposes, complementarity describes phenomena central to jurisprudence, including brain function, human behavior, social institutions, and cultural artifacts. Thus, if complementarity is correct, it would not just explain the nature of law; it would show why human nature compels that explanation.

Complementarity began with the basics. To determine the essential properties of light, physicist Niels Bohr subjected light beams to a variety of tests. When shined through narrow slits, the beam appeared to be an immaterial wave of energy. However, when the light bounced off a metal barrier it appeared to break apart into tiny physical particles. These results led Bohr to three groundbreaking conclusions. First, though energy and matter are fundamentally different, light was *both* an energy-wave *and* a collection of matter-particles.¹⁰⁵ Second, these opposed characteristics were not mutually exclusive, but rather served as necessary and complementary aspects of light as a whole.¹⁰⁶ Finally, the feature of light one detected depended on how the testing and measurement was done, because the process of observation inevitably influenced the thing being observed.¹⁰⁷ According to Bohr, the subject and object were effectively inseparable.

¹⁰³ This is the motto found on the coat-of-arms of acclaimed physicist and complementarity founder, Niels Bohr. See KELSO & ENGSTRÖM, *supra* note 32, at 35.

¹⁰⁴ See *id.* at 15, 85.

¹⁰⁵ See *id.* at 82; Gerald Holton, *The Roots of Complementarity*, 99 DAEDALUS 1015, 1018-19 (1970).

¹⁰⁶ See KELSO & ENGSTRÖM, *supra* note 32, at 82; Holton, *supra* note 105, at 1019.

¹⁰⁷ See KELSO & ENGSTRÖM, *supra* note 32, at 82; Holton, *supra* note 105, at 1018-19.

Although complementarity revolutionized quantum mechanics, Bohr viewed his brainchild more as a metatheoretical work-in-progress than an isolated insight.¹⁰⁸ In fact, Bohr was an early advocate of consilience, and supported the logical positivists' Unity of Science project.¹⁰⁹ Thus, Bohr was interested to see how far complementarity extended into other knowledge domains, including psychology, religion, anthropology, politics, and philosophy.¹¹⁰ Encouraged by his findings, Bohr noted that "in other fields of knowledge . . . we are confronted with situations reminding us of the situation in quantum mechanics;"¹¹¹ namely, that "the integrity of living organisms, and the characteristics of conscious individuals, and human cultures, present features of wholeness, the account of which implies a typical complementarity mode of description."¹¹²

Bohr did not live long enough to realize his vision, but his ideas have inspired a new generation of holistic thinkers. Over the last few decades, luminaries from diverse backgrounds ranging from art and literature to molecular biology and cosmology have explored and elucidated complementary contraries within their specific fields.¹¹³ More recently, various versions of complementarity theory have been applied to neuroscience,¹¹⁴ anthropology,¹¹⁵ psychology,¹¹⁶ and archeology.¹¹⁷

But the most ambitious project has been undertaken by complex systems and brain science theorists, J.A. Scott Kelso and David A. Engström. In their groundbreaking book, *The Complementary Nature*,¹¹⁸ Kelso and Engström offer the most comprehensive exposition of complementarity to date.¹¹⁹ They argue that "[c]ontraries (dichotomies, binary oppositions, duals, paradoxes) occur in every walk of life, at every perceivable and imaginable level" and "can be traced back to the very dawn of humankind."¹²⁰ To illustrate their point, the authors offer abundant examples of complementary pairs from

¹⁰⁸ See Holton, *supra* note 105, at 1020.

¹⁰⁹ See Edward Mackinnon, *Niels Bohr on the Unity of Science*, 2 PHIL. SCI. ASS'N. 224, 224 (1980).

¹¹⁰ See *id.* at 235.

¹¹¹ Holton, *supra* note 105, at 1032.

¹¹² *Id.* (quoting Bohr).

¹¹³ See KELSO & ENGSTRÖM, *supra* note 32, at 36-37 (presenting this information in a descriptive chart).

¹¹⁴ See Stephen Grossberg, *The Complementary Brain: Unifying Brain Dynamics and Modularity*, 4 TRENDS IN COGNITIVE SCI. 233 (2000).

¹¹⁵ See Alan Page Fiske, *Complementarity Theory: Why Human Social Capacities Evolved to Require Cultural Complements*, 4 PERS. SOC. PSYCHOL. REV. 76 (2000).

¹¹⁶ See Henriques, *supra* note 28.

¹¹⁷ See Tim Ingold, *From Complementarity to Obviation: On Dissolving the Boundaries Between Social and Biological Anthropology, Archeology and Psychology*, 123 ZEITSCHRIFT FÜR ETHNOLOGIE 21 (1998).

¹¹⁸ KELSO & ENGSTRÖM, *supra* note 32.

¹¹⁹ In fact, Kelso and Engström do not just explain complementarity; they implement that idea in the organization of their book. Using a clever literary conceit, the book unfolds in three "movements," with its tripartite structure consistently mirroring its message. See *id.* at xv. The first movement lays out their philosophy of complementary pairs—the ubiquitous, coexistent, mutually dependent, and inextricable dichotomies that pervade so much of our existence. See *id.* at 17-76. The second movement discusses the science of coordination dynamics, a theory, addressed later on, that explains the operation of complex systems bearing such complementarities. See *id.* at 77-181. The third movement reconciles the philosophical and scientific concepts to reveal the complementary nature of human brains and behavior. See *id.* at 183-255.

¹²⁰ See *id.* at 17.

philosophy and the sciences,¹²¹ assemble an extensive list of pairs within numerous fields of endeavor,¹²² and even provide the prototype of a complementary pair dictionary.¹²³ But their most notable finding is the complementarity of humanity itself. According to Kelso and Engström, “Human nature is inextricable from the complementary nature.”¹²⁴ “We understand complementary pairs,” they claim, “because we *are* complementary pairs” of minds and bodies.¹²⁵

No matter how broadly they are framed, all complementarity theories face two daunting questions. If binaries like the mind-body dualism are not real, why do they seem so vivid, credible, and ubiquitous? Even more perplexing, if such dichotomies are false, what are the unobserved unities that actually lie hidden from view? In a moment, we shall explore how the emerging theories of complexity and coordination dynamics help to resolve these issues. But first, let’s examine the strides science already has taken to demystify the dualist dilemma.

2. *The Biology of Binaries*

The best way to get to the bottom of the mind-body binary is to traverse the Tree of Knowledge down to its biological roots. Since biology explains physical things like bodies, it is a natural place to start. Within biology, neuroscience examines the physical structures and processes of our brains, which propagate our mental experiences. Thus, if we want to probe the relationship between body and mind, we must turn our attention to the brain sciences.

Because I will discuss the brain more fully later on, I will stick to the basics here. In short, brains are information processing systems designed by evolution to secure the survival of the body’s genes.¹²⁶ These cognitive systems move their bodies around their environments, seeking things like food and shelter that help to sustain life, and avoiding things like poisons and predators that tend to end it.¹²⁷ Brains that successfully solve the problem of survival allow their hosts to pass their genes into the next generation, while unsuccessful brains cause their bodies to die, possibly without reproducing.

Given its evolutionary role, the human brain is intrinsically extrospective. It seeks primarily to process information about the body and its environment to keep its host healthy and safe. The brain did not come into existence to understand itself.¹²⁸ Thus, once such introspection eventually commenced, it is not surprising that the brain would divide the world into two separate parts: material things it must sense for survival, and its own sensorily-inaccessible cognition—or what it would come to call “the mind.” In fact, the brain reflexively concocts tall tales for *all* strange things,

¹²¹ See *id.* at 19-33.

¹²² See *id.* at 36-37 (Table 1), 257-62.

¹²³ See *id.* at 263-86.

¹²⁴ *Id.* at 253.

¹²⁵ *Id.* (emphasis in original).

¹²⁶ See WILSON, *supra* note 27, at 105, 112.

¹²⁷ See Henriques, *supra* note 28, at 153.

¹²⁸ See WILSON, *supra* note 27, at 105.

including its own inner workings. As neuroscientist David Eagleman confirms, “The conscious mind fabricates stories to explain the sometimes inexplicable dynamics of the subsystems inside the brain.”¹²⁹

Dualism, it seems, is one such cognitive delusion. We split the world in two not because our nature has two forms, but rather because we are natural-born dichotomizers. As we shall discover more fully later on, all human beings enter the world with certain innate dispositions or preprogrammed ways of understanding and interacting with their surroundings.¹³⁰ These dispositions frame our perception of everything we encounter, priming us with intuitions about the observed phenomena.¹³¹ Because intuitions are innate and self-operating, we easily mistake them for supernatural epiphanies.¹³² Such revelations just feel different from other cognitions. While intuiting spontaneously erupts from within, learning proceeds mostly from our interaction with the outside world. We comprehend our environment by experiencing it through our bodies. External things stimulate our sense organs, which send sensory information to our brains. Unaware of its own biological mechanics, the brain naturally sees the event in binary terms—as a mindful subject observing a material object.

This perception is reinforced by our dual-process system of cognition. As neuroepistemologist Gerald Edelman explains, human beings possess two modes of thought: pattern recognition and logic.¹³³ To the cognitive agent, these modes appear to work quite differently. Because people are inveterate taxonomists, they automatically organize their sensory inputs into patterns.¹³⁴ Thus, pattern recognition seems to “just happen” when a person is confronted with a new set of stimuli. Before the observer has time to deliberate, she immediately conceptualizes and categorizes the object or experience. Here, cognition feels like a bodily reaction similar to taking a breath or blinking an eye. Logic, by contrast, is a mental process consciously invoked by the agent herself. Because she alone controls the path of her analysis, her thinking seems liberated from bodily influence by the supervening power of her mind.

The pattern formation process—which dominates our cognition—plays an especially powerful role in shaping our dualist mentality.¹³⁵ We comprehend patterns by assembling them into intelligible concepts. Formed

¹²⁹ DAVID EAGLEMAN, *INCOGNITO: THE SECRET LIVES OF THE BRAIN* 148 (Vintage Books ed. 2012).

¹³⁰ See Grossberg, *supra* note 114, at 237-39; Olivier Oullier & Frédéric Basso, *Embodied Economics: How Bodily Information Shapes the Social Coordination Dynamics of Decision-making*, 365 *PHIL. TRANS. ROYAL SOC. B* 291, 293-94 (2010); see *infra* text accompanying notes 375-85.

¹³¹ See David Papineau, *The Poverty of Analysis*, 83 *ARISTOTELIAN SOC. SUPP. VOL. 1*, 17 (2009).

¹³² See SHAPIRO, *supra* note 16, at 15 (arguing that the conceptual analysis of analytic jurisprudence is based on “truisms,” which the author defines as “those truths that those who have a good understanding of how legal institutions operate (lawyers, judges, legislators, legal scholars, and so on) take to be self-evident, or at least would take to be so on due reflection”).

¹³³ See GERALD M. EDELMAN, *SECOND NATURE: BRAIN SCIENCE AND HUMAN KNOWLEDGE*, 82-83, 103-04 (2006).

¹³⁴ See MICHAEL S. GAZZANIGA, *HUMAN: THE SCIENCE BEHIND WHAT MAKES US UNIQUE* 459 (2008).

¹³⁵ See EDELMAN, *supra* note 133, at 58-59, 82-83, 103-04.

in the hippocampus region of the brain.¹³⁶ concepts help us identify existing things, predict future events, and create new ideas.¹³⁷ Each concept consists of a cluster of exemplars, or elements of meaningful imagery.¹³⁸ The brain continually distills these concepts and exemplars into their simplest possible forms until they cannot be reduced any further. From an infinite variety of classifications, it eventually splits the world into binary oppositions like this and that, me and you, and us and them.¹³⁹ Together, such concepts create boundaries that delimit the idea or image of the object in question. Things possessing the conceptual exemplars fall within these boundaries; those that do not are excluded. Indeed, the most basic function of a conceptual category is the creation of an irreducible binary: something with all of X's exemplars is X; everything else is first and foremost, Not-X. Categories might change over time, and certain things may share various features, but whenever the brain creates or invokes a discrete concept, it naturally seems to draw a dualistic distinction.

Not surprisingly, the brain's dual-process functions have spawned several basic conceptual oppositions. According to psychologist Paul Bloom, human beings naturally distinguish between tangible and intangible phenomena.¹⁴⁰ Interpreting the results of cognitive development studies, Bloom concludes that we are born dualists with two ways of looking at the world: "in terms of bodies and in terms of souls."¹⁴¹ Professor Gazzaniga, who shares this interpretation, reduces the distinction even further, finding disparate treatment of things visible and invisible. In his words:

Objects, the material, physical things of the world, are treated separately and differently from the nonvisible psychological states of goals, beliefs, intentions, and desires. Different inferences are made. Part of that physical world is what you can look down and see: your body, that physical biological object that eats and sleeps and walks and has sex and dies. But the psychological part is not visible; it does not have an obvious physical substance and is subject to different processing and inferences. It is not a physical biological object subject to that same array of inferences. You have a nonreflective intuitive belief that the body and its conscious essence are separate.¹⁴²

¹³⁶ See Rodrigo Quian Quiroga et al., *Brain Cells for Grandmother*, 308 SCIENTIFIC AMERICAN 30, 33, 35 (2013); *Small groups of brain cells store concepts for memory formation—from Luke Skywalker to your grandmother*, SCIENCE DAILY (Feb. 22, 2013), <http://www.sciencedaily.com/releases/2013/02/130222083049.htm> [<https://perma.cc/Z2TW-MZGV>]; Nic Fleming, *Concepts are born in the hippocampus*, NEW SCIENTIST (Sept. 28, 2009), <http://www.newscientist.com/article/dn17862-concepts-are-born-in-the-hippocampus/> [<https://perma.cc/537L-CZL7>].

¹³⁷ See WILSON, *supra* note 27, at 119, 123, 146-47, 166-67.

¹³⁸ See ANTONIO DAMASIO, DESCARTES' ERROR: EMOTION, REASON, AND THE HUMAN BRAIN 88-89, 96-104 (Penguin Books ed. 2005); Stephen Stich & Jonathan Weinberg, *Jackson's Empirical Assumptions*, 62 PHIL & PHEN. RES. 637, 639 (2001).

¹³⁹ See WILSON, *supra* note 27, at 166-67.

¹⁴⁰ PAUL BLOOM, DESCARTES' BABY: HOW THE SCIENCE OF CHILD DEVELOPMENT EXPLAINS WHAT MAKES US HUMAN (2004).

¹⁴¹ *Id.* at 191.

¹⁴² GAZZANIGA, *supra* note 134, at 268.

This dualist tendency is intensified by our propensity to differentiate animate and inanimate objects. As I will explain more fully later on, all humans possess a so-called “theory of mind” that permits them to understand the thoughts and intentions of other conscious beings.¹⁴³ That capacity derives from an even more basic discriminatory instinct. We believe animals have invisible essences that afford them self-generated motion, but see artifacts in essentially functional terms.¹⁴⁴ In humans in particular, we assume their actions are *caused* by their purposeful mental states and not by the physical laws of nature. Consequently, our theory of mind subtly begets our dualist theory of human and natural kinds. According to embodied cognition expert Edward Slingerland, “our possession of ToM [theory of mind] both explains the continued appeal of mind-body dualism—as well as the sciences/humanities divide that grows out of it—and reduces its empirical plausibility.”¹⁴⁵ The reason Descartes’ cogito ergo sum argument has proven so powerful, Slingerland continues, is not because it is a good argument; rather, it is because “we are designed by natural selection to find it convincing.”¹⁴⁶

Neuroscientist Michael Graziano says such misplaced mindfulness can be traced all the way back to our consciousness. In Graziano’s view, human consciousness arises out of the same brain regions as the capacity for social perception.¹⁴⁷ This neural machinery allows us not only to understand other people’s minds, but also to explain our own self-awareness.¹⁴⁸ According to Graziano’s Attention Schema Theory, consciousness is a schematic model of attention.¹⁴⁹ Although my brain knows *when* something grabs my attention—and recognizes the “me” whose attention is grabbed—it does not know *how* or *why* this occurs. Indeed, because such processing takes place inside the brain, these operational details are totally inaccessible to my cognitive apparatus.¹⁵⁰ In this respect, an individual’s consciousness is just as mysterious as the intentions of complete strangers.¹⁵¹

So the brain creates an outline, sketch, or cartoon of its own awareness—a just-so story of how it *thinks* it thinks.¹⁵² Thus, when we try to describe consciousness, Graziano notes, “[w]e report an experience, a feeling, an aura, something ethereal, something incorporeal, because that is the brain’s schematized way to depict attention.”¹⁵³ This cryptic “intuition” surely simplifies an otherwise incomprehensible phenomenon. But it is not an extrasensory revelation of some transcendental truth, and it surely is no proof of a mind-body dualism. Instead, it is the technical report of a biological data

¹⁴³ See *infra* text accompanying notes 248-51.

¹⁴⁴ See John Tooby & Leda Cosmides, *supra* note 86 at 71.

¹⁴⁵ Slingerland & Collard, *supra* note 47, at 12.

¹⁴⁶ *Id.*

¹⁴⁷ MICHAEL S.A. GRAZIANO, CONSCIOUSNESS AND THE SOCIAL BRAIN 9, 31, 99, 123, 181, 190 (2013).

¹⁴⁸ See *id.* at 31, 208.

¹⁴⁹ See *id.* at 23, 25, 59, 79.

¹⁵⁰ See *id.* at 52.

¹⁵¹ See *id.* at 31, 62, 99.

¹⁵² See *id.* at 8-9, 28, 59, 79, 116.

¹⁵³ *Id.* at 52.

processor executing a useful algorithm to explain and perpetuate its own very tangible existence.¹⁵⁴

The dualist distortion of consciousness is only enhanced by our neural dynamics. As noted earlier, the brain's main job is to make decisions necessary for the body's survival. To facilitate this process, the brain maintains a constant state of metastability. As Kelso and Engström explain, metastability is the brain's capacity to simultaneously possess two contradictory tendencies—one for its neurons to maintain their independence and the other for them to bond and couple.¹⁵⁵ These tendencies give neurons a bistable quality.¹⁵⁶ When at rest, neurons remain relatively dormant and autonomous. However, as the cells are stimulated by electrical charges from other neurons, they become connected and begin to fire collectively.¹⁵⁷ This switch from “off” to “on” and from “segregated” to “integrated” is a dynamic bifurcation.¹⁵⁸ Because these neuronal switches create and transmit information, the process seems to reduce to the simple binary choice of “yes, I'll collaborate” or “no thanks, I'll pass.”¹⁵⁹ As such choices occur, information shifts accordingly. The transition phases between differing states precipitate corresponding changes in perception, attention, memory, and action.¹⁶⁰ It is little wonder, then, why the host of these experiences would tend to approach the world from an “either/or” perspective.

3. *The Circle of Life*

Such bifurcations help us think quickly and act decisively, which ultimately promotes our survival. The predator who cannot tell a lion from a rabbit, or who cannot decide what to do when attacked by a bear, is bound to have a very short reign. So evolution does us a great favor by sharpening our choices. Should we fight or flee? Do we compete or cooperate? Will we punish or reward behavior? Thinking in twos simplifies tough questions so we can get on with the business of life.

But biology is filled with self-deception for animals and people alike.¹⁶¹ The mind-body dualism is just a particularly conspicuous example of this deceit. The truth is that life in general, and human nature in particular, is more of a circle than a bifurcating slash. As complementarity theory suggests, things in nature are inextricably interconnected, dynamically fluid, and persistently reflexive. What's more, their holism is consilient at each level of existence, from the universe to earth's biosphere to its human inhabitants to their bodies and brains and into their DNA.¹⁶²

¹⁵⁴ See *id.* at 208, 210-11, 230-31.

¹⁵⁵ See KELSO & ENGSTRÖM, *supra* note 32, at 10-11, 103.

¹⁵⁶ See *id.* at 135.

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ *Id.* at 101.

¹⁶⁰ See David A. Engström & J.A. Scott Kelso, *Coordination Dynamics of the Complementary Nature*, 30 GESTALT THEORY 121 (2008), <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2903971/pdf/nihms67694.pdf>. [https://perma.cc/7XKW-X6ZN].

¹⁶¹ See ROBERT WRIGHT, *THE MORAL ANIMAL: WHY WE ARE THE WAY WE ARE* 263-65 (1994).

¹⁶² For an excellent exposition of this holistic view, see SCHRIJVER & SCHRIJVER, *supra* note 1.

Because human beings are part of the natural world, they are not passive witnesses to their surroundings. Rather, they are co-creators of their own reality. Bestowed with embodied cognition,¹⁶³ a person's knowledge of the world is neither entirely physical nor entirely mental. It is a seamless synthesis of the two. As neuroscientist Antonio Damasio explains:

The human brain and the rest of the body constitute an indissociable organism, integrated by means of mutually interactive biochemical and neural regulatory circuits (including endocrine, immune, and autonomic neural components); (2) The organism interacts with the environment as an ensemble: the interaction is neither of the body alone nor of the brain alone; (3) The physiological operations that we call mind are derived from the structural and functional ensemble rather than from the brain alone: mental phenomena can be fully understood only in the context of an organism's interacting in an environment. That the environment is, in part, a product of the organism's activity itself, merely underscores the complexity of interactions we must take into account.¹⁶⁴

This cognitive ensemble effectively assembles meaning from sensory impressions, emotion, memory, and creative extrapolation.¹⁶⁵ As Edward Wilson explains, "Mind is a stream of conscious and subconscious experience" consisting of "the coded representations of sensory impressions and the memory and imagination of sensory impressions."¹⁶⁶ Some brain regions track events in the outside world, while others monitor the body's internal states,¹⁶⁷ including its respiration, heartbeat, and digestion, among other things.¹⁶⁸ Combined with the host's own stored information,¹⁶⁹ these neural systems check and reinforce each other, creating a repeating loop of cognition.¹⁷⁰ Because the data are indistinguishably mixed, the final manufactured understanding is a sort of "virtual reality."¹⁷¹ That reality might closely match the external artifact under examination, but it also might depart indefinitely far from it, offering instead a recreation of the host's past experiences or the fabrication of new alternatives for future thought and action.¹⁷²

Brains do not just connect human beings to their bodies and surroundings. Our miraculous neural network also integrates its own internal cognitive systems. Although there are two brain hemispheres, and numerous local modules within each half, the brain exudes the combative yet connective properties of complementarity. Indeed, Professor Eagleman

¹⁶³ See DAMASIO, *supra* note 138, at 234; Oullier & Basso, *supra* note 130, at 293; Christina Toren, *Making History: The Significance of Childhood Cognition for a Comparative Anthropology of Mind*, 28 *MAN* 461, 462 (1993).

¹⁶⁴ DAMASIO, *supra* note 138, at xx-xxi.

¹⁶⁵ *See id.* at 97-98.

¹⁶⁶ WILSON, *supra* note 27, at 119.

¹⁶⁷ *See* EAGLEMAN, *supra* note 129, at 110.

¹⁶⁸ WILSON, *supra* note 27, at 123.

¹⁶⁹ *See id.* at 119-20.

¹⁷⁰ *See id.* at 123.

¹⁷¹ *Id.* at 120.

¹⁷² *Id.*

likens the brain to a “team of rivals” whose members share the same goal but have different ways of achieving it.¹⁷³ Individually, a single neural neuron has little decision making power. But, Eagleman adds, “each neuron is connected to thousands of others, and they in turn connect to thousands of others, and so on in a massive, loopy, intertwining network.”¹⁷⁴ Such neural networks “cross-talk with other complexes to form systems of systems, in places forming a circle, like a snake catching its own tail, to create reverberating circuits.”¹⁷⁵ When circuits split, the rivals compete for the host’s attention until a victor finally prevails.¹⁷⁶ Even then, these converging streams of activity never lose their unity because the signals they produce continue to move backward *and* forward, perpetuating global feedback loops while searching for new coalitions.¹⁷⁷

Throughout this holistic process, the brain cycles through phases of stability and instability. But the involved brain regions are neither fully locked into that mental state nor completely independent of it.¹⁷⁸ Instead, they maintain a condition of metastability. As we learned earlier, this perpetual state of readiness keeps the brain receptive to all incoming stimuli, including those that may conflict. Thus, even while one neural network forms to create a thought, another may arise to take its place. Because the two opposed tendencies appear simultaneously within the same associative system, their coexistence illuminates the brain’s complementarity.

Our complementary brain returns us full circle to the natural world. Just as the brain’s metastability integrates our minds, our minds meld with reality in the same reciprocal way. Minds certainly shape nature, but nature also shapes our minds. As neuroscientist Stephen Grossberg aptly summarizes, “The ‘complementary’ brain might . . . best be understood through analyses of the cycles of perception, cognition, emotion and action, by which the brain is intimately linked to its physical environment through a continuously operating feedback cycle.”¹⁷⁹

C. COMPLEXITY AND COORDINATION DYNAMICS

1. *Pattern Transitions*

Complementarity theory uses all of the resources of consilience to show us that the persistent dichotomies we face—in law as in life—are actually complementary pieces of cohesive yet complex systems. But it does not tell us *how* these pieces are unified. This is the job of coordination dynamics, the final stage of jurisilience. Coordination dynamics is the *process* by which complex systems operate.

¹⁷³ EAGLEMAN, *supra* note 129, at 109.

¹⁷⁴ *Id.* at 113.

¹⁷⁵ WILSON, *supra* note 27, at 114. As Professor Damasio points out, “mind integration is created from the concerted action of large-scale systems by synchronizing sets of neural activity in separate brain regions.” DAMASIO, *supra* note 138, at 95.

¹⁷⁶ See EAGLEMAN, *supra* note 129, at 114.

¹⁷⁷ See DAMASIO, *supra* note 138, at 93.

¹⁷⁸ See Engström & Kelso, *supra* note 160, at 7.

¹⁷⁹ See Grossberg, *supra* note 114, at 244.

Because complex systems exhibit intricate patterns of coordinated interaction, coordination dynamics essentially concerns pattern transitions. Specifically, according to the theory's chief proponents, Kelso and Engström, coordination dynamics "is a set of context-dependent laws or rules that describe, explain, and predict how patterns of coordination form, adapt, persist, and change in natural systems."¹⁸⁰ Throughout this process, a system's competing tendencies push and pull those patterns in different directions. Coordination dynamics is the means of reconciling these oppositions to keep the system working effectively.¹⁸¹ While reconciliation requires an accommodation of alternatives, coordination dynamics does not necessarily seek balance.¹⁸² Instead, it seeks the best arrangement given the facts. As the "dynamic duo" explain: "if better ways are out there to fit the circumstances and context of a given coordination pattern, fluctuations will help the system (and us) discover and explore them."¹⁸³

Coordination dynamics itself is the latest phase of a knowledge system called complex adaptive systems theory, or complexity theory for short.¹⁸⁴ Though definitions vary, complexity theory has been described as "the study of systems comprised of a macroscopic, heterogeneous set of autonomous agents interacting and adapting in response to one another and to external environmental inputs."¹⁸⁵ Or to put it more simply, complexity examines the interrelationship among parts of a system, the parts and the whole, and the whole and other systems.¹⁸⁶

Intrigued by the volatility of such systems, Kelso, Engström, and other adventurous researchers began synthesizing complexity principles from across disciplines to develop the growing field of coordination dynamics.¹⁸⁷ Still an infant science, coordination dynamics already has influenced a broad range of subjects, including physical chemistry, kinesiology, theoretical biology, experimental and developmental psychology, neuroscience, and theoretical physics.¹⁸⁸ Within these fields, it has explained and linked a wide variety of seemingly unrelated things, like the bistability of a fungus,¹⁸⁹ animal and human body movement,¹⁹⁰ the operation of the human brain,¹⁹¹ syncopated personal or group encounters,¹⁹² general social behavior,¹⁹³ and

¹⁸⁰ KELSO & ENGSTRÖM, *supra* note 32, at 90.

¹⁸¹ *See id.* at xii-xiii.

¹⁸² J.A. Scott Kelso & Emmanuelle Tognoli, *Toward a Complementary Neuroscience: Metastable Coordination Dynamics of the Brain*, in DOWNWARD CAUSATION AND THE NEUROBIOLOGY OF FREE WILL 108 (Nancy Murphy, George F.R. Ellis & Timothy O'Connor eds., 2009).

¹⁸³ KELSO & ENGSTRÖM, *supra* note 32, at 97.

¹⁸⁴ *See* MELANIE MITCHELL, COMPLEXITY: A GUIDED TOUR x (2009).

¹⁸⁵ *See* J.B. Ruhl, *Law's Complexity: A Primer*, 24 GA. ST. U.L. REV. 885, 887 (2008).

¹⁸⁶ *See About Complex Systems*, NEW ENG. COMPLEX SYS. INST., <http://www.necsi.edu/guide/study.html>, [<https://perma.cc/T43C-R2WY>].

¹⁸⁷ *See* Engström & Kelso, *supra* note 160, at 4.

¹⁸⁸ *See* KELSO & ENGSTRÖM, *supra* note 32, at 88-89.

¹⁸⁹ *See id.* at 243.

¹⁹⁰ *See* J.A. SCOTT KELSO, DYNAMIC PATTERNS: THE SELF-ORGANIZATION OF BRAIN AND BEHAVIOR 70-90 (1995).

¹⁹¹ *See* KELSO & ENGSTRÖM, *supra* note 32, at 142-49; *see generally* Kelso & Tognoli, *supra* note 182 (explaining the coordination dynamics of the brain).

¹⁹² *See* KELSO & ENGSTRÖM, *supra* note 32, at 149-50; Charles A. Coey et al., *Coordination Dynamics in a Socially Situated Nervous System*, 6 FRONTIERS IN HUM. NEUROSCIENCE 1, 5-7 (2012).

¹⁹³ *See* KELSO & ENGSTRÖM, *supra* note 32, at 103; Coey et al., *supra* note 192, at 4.

the behavior of economic markets.¹⁹⁴ Inevitably, coordination dynamics will help us understand our coordinative institution of law. Before it does, however, we must first grasp the laws behind this process.

2. *Controlled Chaos*

Perhaps the primary rule of coordination dynamics is its frugality towards rules. It sees complex systems as relatively free-form associations with no executive officers, no set structures, and no predetermined objectives—yet it is not anarchic. Coordination dynamics features several defining characteristics and operates according to some discrete principles. Think of it as controlled chaos: a dynamic reconciliation of its own complementary opposites.

Coordination dynamics holds that patterns within complex systems are a product of emergence or self-organization. For present purposes, emergence means three things. First, patterns in nature arise spontaneously and are not the result of some master plan or organizational design.¹⁹⁵ Second, the pattern-forming process is decentralized so there is no single causal agent—or homunculus—pulling the strings.¹⁹⁶ Third, pattern formation is synergistic. Patterns emerge when two system components temporarily couple for a mutual, task-specific, functional purpose and decouple when that synergy disappears.¹⁹⁷ When these dimensions of self-organization coalesce, coordination patterns just seem to pop up out of nowhere and morph on their own, much like a flock of birds, school of fish, or swarm of bees;¹⁹⁸ the convection rolls in boiling oil;¹⁹⁹ a country square dance;²⁰⁰ or “the wave” at a baseball game.²⁰¹

Such patterns are dynamic in both cause and effect. Coordination dynamics applies to “open” systems that constantly exchange matter, energy, and information with adjoining systems.²⁰² Spurred by instability and disequilibrium *within* each system, this transboundary migration stimulates synergies *between and among* the participants.²⁰³ These couplings and decouplings continue unless and until they produce a stable pattern suitable to the environment. Otherwise, opposed tendencies “shift and move, never at rest, seesawing back and forth through myriad multifunctional possibilities.”²⁰⁴

During this process, the form of each pattern becomes indistinguishable from its content as the parts define the whole and the whole defines the parts.²⁰⁵ Kelso compares these dynamic patterns to a river, “whose eddies,

¹⁹⁴ See KELSO & ENGSTRØM, *supra* note 32, at 231-34.

¹⁹⁵ See *id.* at 92, 105, 112.

¹⁹⁶ See *id.* at 92.

¹⁹⁷ See Coey et al., *supra* note 192, at 4.

¹⁹⁸ See KELSO & ENGSTRØM, *supra* note 32, at 112.

¹⁹⁹ See Coey et al., *supra* note 192, at 3.

²⁰⁰ See Kelso & Tognoli, *supra* note 182, at 4.

²⁰¹ See KELSO, *supra* note 190, at 8.

²⁰² See KELSO & ENGSTRØM, *supra* note 32, at 112.

²⁰³ See *id.* at 10, 97; KELSO, *supra* note 190, at 4.

²⁰⁴ KELSO & ENGSTRØM, *supra* note 32, at 4.

²⁰⁵ See *id.* at 90, 98; KELSO, *supra* note 190, at 1.

vortices, and turbulent structures do not exist independent of the flow itself.”²⁰⁶ By no coincidence, others have used virtually the same analogy to describe human nature. Likening the human form to a wave, the Schrijvers note that “[t]he wave is a pattern of motion that travels in space and time, but the water that makes a wave at any given moment resides within it only briefly.”²⁰⁷ Similarly, “we [humans] are a composite of patterns that are shaped by the chemical components coming into us and which travel with us temporarily before they are discarded and left behind as new ones are collected and incorporated.”²⁰⁸ People, it appears, are just another part of nature’s dynamic process: coordinated patterns of elements coordinating with the dynamic patterns of other complex systems.

In fact, the multilayered and interdependent facets of coordination dynamics are two of its most critical features. Complex systems do not exist in a vacuum. Rather, they overlap, connect, and interact with each other on all sides. While the systems are stacked in increasing orders of magnitude, each individual system also possesses different levels of functional complexity. For example, humans coordinate with others by forming a variety of progressively complex groups, including families, neighborhoods, cities, counties, states, nations, and international organizations. Each system has elements that make up the whole, and each unified whole interfaces with adjoining systems. In the case of a family, every member is composed of genetic elements that link all as kin; together, the kin constitute parts of a whole clan, which itself must coexist with other families, groups, and communities.

Like complexity theory more generally, coordination dynamics applies at each level of specificity, explaining and coupling the patterns *within* each part of a system, the patterns existing *between* system parts, the patterns of the *entire* system, and the patterns *between that system and its environment*.²⁰⁹ Because every system is situated between others, there is no absolute macro or micro level of analysis, and no level is more essential than any other.²¹⁰ The observer must simply pick a system of interest and account for the dynamic influences emanating from above and below.²¹¹

No matter which level one chooses, the dynamics at work remain precisely the same. According to Kelso and Engstrøm, all coordinative patterns contain three defining characteristics: (1) the boundary conditions or control parameters constraining the pattern, (2) the elements forming the pattern, and (3) the dynamics or contours of the pattern itself.²¹² These characteristics relate to the nested levels of complexity. The boundaries create the system’s upper level, the element properties establish the system’s lower level, and the dynamic pattern suffuses everything in between.²¹³ Thus,

²⁰⁶ KELSO, *supra* note 190, at 1.

²⁰⁷ SCHRIJVER & SCHRIJVER, *supra* note 1, at 5.

²⁰⁸ *Id.* at 5-6.

²⁰⁹ See KELSO & ENGSTRØM, *supra* note 32, at 90-91; KELSO, *supra* note 190, at 70.

²¹⁰ See KELSO & ENGSTRØM, *supra* note 32, at 109.

²¹¹ See *id.* at 116.

²¹² See *id.* at 109; KELSO, *supra* note 190, at 18.

²¹³ See KELSO & ENGSTRØM, *supra* note 32, at 114.

upon choosing a level of description. “one must ‘look up’ a level for the boundary conditions, and ‘look down’ a level for the individual coordinating elements” before attempting to discern the operative pattern.²¹⁴ Because the levels are interconnected, each is bound in a loop of reciprocal or circular causality. What happens at the top affects the levels below, and the activity at the bottom impacts the levels above.²¹⁵

Kelso and Engström use the example of a traffic jam to illustrate the concept.²¹⁶ Assume you are driving south on a crowded highway. Miles ahead, an accident occurs in the northbound lanes. Several southbound drivers see the crash and instinctively slow to a crawl. Dozens of ensuing motorists reduce their speeds to gape at its aftermath. Before long, all southbound lanes are jammed as drivers hit their brakes to avoid colliding with the gapers. Suddenly, you have become the unwitting victim of coordination dynamics. The traffic jam is an emergent pattern coordinating southbound vehicle movement from fast to slow and back to fast. Each southbound driver is a separate coordinating element in that system. Acting individually, the motorists’ slow driving in confined space creates a collective “jam” that makes it impossible for other southbound drivers to speed by the accident site. The jam now becomes a boundary condition and control parameter that limits the driving of each succeeding motorist. When the crash clears and the gaping stops, the confining conditions disappear and the motorists individually and collectively resume normal driving patterns. But the moment another driver brakes, swerves, or changes lanes, such interstate coordination dynamics immediately adapt to the fluid conditions of the roadway.

Of course, coordination dynamics is not just a lucid metaphor for comprehending traffic flow. As conceived by Kelso and Engström, it is a veritable theory of everything, explaining complex systems of all sorts, including most especially the complex systems of humanity.²¹⁷ They see coordinated patterns within and between genes and proteins, different brain regions, various parts of the body, natural organisms and their environments, and among people, social structures, and institutions.²¹⁸ In the next part, we will begin to collect the knowledge necessary to support their position; and in the process, expose the coordinated dynamism of our most human institution—law.

III. GENES TO BRAINS

As a branch of the humanities, general jurisprudence has studied law by taking a top-down approach to the Knowledge Tree. Legal theorists often view law strictly as a philosophical concept explainable by rational or historical analysis in abstract, universal terms without consulting the “lower”

²¹⁴ *Id.* at 118.

²¹⁵ *See id.* at 114-15.

²¹⁶ *See id.*

²¹⁷ *See id.* at 253.

²¹⁸ *See id.* at 111.

sciences.²¹⁹ Though some jurists look to social sciences like economics, psychology, and sociology, they typically enlist these subjects solely to deepen their conceptual analysis.²²⁰ The few who *have* embraced a sociological perspective invariably have gotten stuck in the Tree's middle branches—unable or unwilling to see beyond the law's intricate pluralism.²²¹ So far, no jurisprudential approach has begun at the Tree's natural science roots and progressively worked its way up toward a unified conception of law.²²² While many have searched for the essential nature of law, none has based that search on a consilient portrait of human nature.

We now embark on that new journey. In this Part, we will explore the natural sciences of evolutionary biology and neuroscience, then trek upward into the border disciplines of moral and developmental psychology, and finish with the social sciences of sociology and anthropology. Together, these knowledge domains create the foundations of “juriscience,”²²³ the scientific underpinning to jurisilience. When combined with the lessons of jurisprudence, juriscience will round out our understanding of legality.

Before taking this final step, however, we first must do the necessary groundwork of exposing law's essential humanity. As we climb the branches of the Knowledge Tree, we find that the human condition underlying law is not a static state of binary oppositions. Rather, it is a complex process of consilience, complementarity, and coordination dynamics.

Since coordination dynamics is about movement, the discussion generally will track the phases of human development, progressing first from genes to brains, transitioning to psychological appetites, and culminating in epigenetics. Although discipline-specific subheadings will identify the knowledge domains applicable to each phase, these demarcations are included mainly for cross-referencing purposes. Given the effects of consilience, such conceptual boundaries are becoming increasingly blurry. Nowadays, many natural sciences explain our social practices, while many social sciences inform man's natural foundations. Thus, despite the

²¹⁹ See HART, *supra* note 19, at 13 (asserting that social science is basically useless to legal theory); David Sugarman, *Hart Interviewed: H.L.A. Hart in Conversation with David Sugarman*, 32 J. L. & SOC'Y 267, 289 (2005) (same); Dworkin, *supra* note 23, at 1681 (deriding the “mysterious notion” that law has an essential nature that could be discovered through the natural and social sciences).

²²⁰ See sources cited *supra* note 20.

²²¹ See, e.g., TWINING, *supra* note 17 (using social science to present a pluralist conception of law); Sally Engle Merry, *Legal Pluralism*, 22 LAW & SOC'Y REV. 869 (1988) (offering a social science version of pluralism).

²²² Some scholars, including Owen Jones, John Mikhail, and Paul Robinson, have explored law primarily through the natural and/or social sciences, but have not yet attempted the sort of thoroughgoing consilience envisioned here. See, e.g., Owen D. Jones, & Timothy H. Goldsmith, *Law and Behavioral Biology*, 105 COLUM. L. REV. 405 (2005) (identifying the biological bases of law); John Mikhail, *Any Animal Whatever? Harmful Battery and Its Elements as Building Blocks of Moral Cognition*, 124 ETHICS 750 (2014) (exploring the moral psychology of a battery action); Paul H. Robinson et al., *The Origins of Shared Intuitions of Justice*, 60 VAND. L. REV. 1633 (2007) (explaining the evolutionary, neuroscientific, and psychological origins of justice). Section V.C.2 provides a fuller survey of theories taking more naturalized or systemic approaches to law.

²²³ “Juriscience” originally was coined by Judge Howard T. Markey as a pejorative term to describe what he saw as the dangerous scientizing of law. See Howard T. Markey, *Juriscience or “Juriscience?”*, 25 WM. & MARY L. REV. 525, 526 (1984) (arguing that the infiltration of science into law destroys “values recognized for centuries” like “mercy, compassion, freedom, and justice”). I hope to rehabilitate this concept by showing the many benefits of fusing jurisprudence and science.

material's serial presentation, the insights here are actually interconnected and synergistic.

A. EVOLUTIONARY BIOLOGY

Before there were human beings there were groups of amino acids—called genes—that figured out both how to form human beings and how to continually reproduce them.²²⁴ Biologically embedded in their hosts, genes propagate an incredibly adaptive blueprint of humanity, transmitting essential information from one generation of human beings to the next through the evolutionary process of natural selection. Although this revisionary process occurs at random, its purpose is entirely predictable. Evolution helps people meet life's biggest challenges—securing their survival, facilitating their cooperation, informing their morality, and ultimately, precipitating their sense of legality. Because the story of evolution is familiar, I will not detail it here. I will merely highlight the features of evolutionary biology that are particularly relevant to the themes of jurisilience.

1. Survival

A gene's single, selfish goal is to perpetuate itself.²²⁵ To exist in perpetuity, a gene must reproduce; to reproduce, it must live. Thus, the gene's most immediate objective is to secure its own survival.²²⁶ Because genes live inside human beings, a gene's life usually depends on the life of its host. If the host lives, the gene survives. If the host dies before reproducing, the gene not only perishes, it terminates its evolutionary run.

Thus, genes must solve the problem of survival or face certain extinction. This problem has three dimensions. In one sense, genes compete with each other. To be more precise, they battle similar genes residing in different hosts.²²⁷ Genes that effectively solve the survival problem save their hosts. Thus, their solutions tend to get passed on to the next generation. Meanwhile, poor problem solvers send their hosts to an early demise.²²⁸ Having failed the test of evolution, the underperformers cannot matriculate. The school of life offers no do-over. The struggling students inevitably drop out, and the best students eventually graduate.

Besides enduring this evolutionary competition, genes also face a biological challenge. Human bodies have natural limits. If they ingest too much or too few nutrients, they can falter from over- or under-consumption. If their temperature gets too hot or too cold, they can suffer hyper or hypothermia. If they work too hard for too long, or not nearly hard or long

²²⁴ See Henriques, *supra* note 28, at 153.

²²⁵ See generally RICHARD DAWKINS, *THE SELFISH GENE* 7-20 (1976) (espousing the view that the gene's goal is to secure its own immortality).

²²⁶ See Richard D. Alexander, *Evolutionary Selection and the Nature of Humanity*, in *DARWINISM & PHILOSOPHY* 301, 309 (Vittorio Hösle & Christian Illies eds., 2005).

²²⁷ See Edwin Fruehwald, *The Biological Basis of Rights*, 19 S. CAL. INTERDISC. L.J. 195, 199 (2010).

²²⁸ See MARC D. HAUSER, *MORAL MINDS: HOW NATURE DESIGNED OUR UNIVERSAL SENSE OF RIGHT AND WRONG* 312 (2006).

enough, they can die from overexertion or underuse. The human genome solves this problem by equipping its hosts with homeostasis.

Homeostasis is an internal monitoring system that “knows” the body’s tolerances, sets performance ranges for important bodily functions, and senses when the host’s physiology pushes its outer limits.²²⁹ If the body experiences abnormalities in body temperature, heart rate, blood pressure, or carbon dioxide levels, the homeostatic watchman sounds the alarm, triggering emotions like fear, anxiety, or pain to signal the dangerous breach and alert the host to take corrective action.²³⁰ Throughout this process, homeostasis effectively operates by coordination dynamics, maintaining the body’s metastability by establishing its control parameters and delicately coordinating the performance patterns of its vital systems.

Perhaps the gene’s greatest threat comes from the environment outside its host. Human bodies are not self-sustaining. They require food for energy, shelter for temperature control, and mates for reproduction. Unfortunately, such resources are limited or difficult to access. Thus, at any given time, there simply will not be enough resources to satisfy everyone. Because all people have the same needs, they must compete for life’s necessities.²³¹ Such human competition intensifies the gene’s struggle for survival.

In fact, rivalries among human beings exist at several levels.²³² Within the same family, siblings must compete for care and protection from parents and other relatives. As families cluster into larger groups, group members must vie for favored status or authority. Even after these hierarchies become settled, such associations face challenges from different groups seeking to maximize their resources.

2. Cooperation

Combined with our innate vulnerabilities, human beings face a daunting list of adaptive problems. According to psychologist Jonathan Haidt, these include “caring for vulnerable children, forming partnerships with non-kin to reap the benefits of reciprocity, forming coalitions to compete with other coalitions, negotiating status hierarchies, and keeping oneself and one’s kin free from parasites and pathogens, which spread quickly when people live in close proximity to each other.”²³³ All of these quandaries are coordinative in nature. Humans must coordinate their lives not only with other people, but also with other living things that inhabit their environment. Because these coordination dynamics are crucial to survival, genes must find ways to get people to master them.²³⁴

²²⁹ PATRICIA S. CHURCHLAND, BRAINTRUST: WHAT NEUROSCIENCE TELLS US ABOUT MORALITY 28 (2011); DAMASIO, *supra* note 138, at 109-110.

²³⁰ See CHURCHLAND, *supra* note 229, at 34-35.

²³¹ See JOSHUA GREENE, MORAL TRIBES: EMOTION, REASON, AND THE GAP BETWEEN US AND THEM 23-24 (2013).

²³² See CHURCHLAND, *supra* note 229, at 59.

²³³ JONATHAN HAIDT, THE RIGHTEOUS MIND: WHY GOOD PEOPLE ARE DIVIDED BY POLITICS AND RELIGION 146-147 (2012).

²³⁴ See GREENE, *supra* note 231, at 23-24.

Historically, two strategies have competed for supremacy. One is to take what one wants by force or deception. Despite its attractive simplicity, however, this tactic suffers from a critical flaw: the utter precariousness of the human condition. Human beings are fragile things. They can be corrupted by poisons or parasites, and subdued or broken by physical force. While that vulnerability may seem to favor belligerence, no aggressor is superhuman. Even the fittest bully shares the same basic physical limitations as everyone else, even if she is marginally stronger. Thus, any human aggression can be stopped by a superior force. Given our essential equality, all it takes to defeat the mightiest aggressor is a group of people cooperating against her.²³⁵

Cooperation not only thwarted nonconsensual takings, it promised to offer a better success strategy overall. Yet compromise would not come easy, at least not at first. Cooperation in the face of competition creates one of mankind's most enigmatic complementarities. People see the two as incompatible choices: either go it alone or get along. In reality, however, they are opposed but complementary tendencies in the dynamic process of social living. Individual competition spurs cooperation; cooperation promotes transitory stability among individuals; as resources are consumed and needs arise, stability gives way to individual instability; individual instability leads to competition; and the dynamic pattern keeps repeating. Cooperation harmonizes these antagonistic impulses by allowing competitors to coordinate their survival efforts.

Over the ages, natural selection has proven that people are more effective doing things together—like hunting, building, and defending—than they are alone.²³⁶ This pattern of coordination dynamics did not begin with human evolution but has shaped the entire course of natural history. As philosopher and neuroscientist Joshua Greene, observes:

[Cooperation] has guided the evolution of life on earth from the start. Approximately four billion years ago, molecules joined together to form cells. About two billion years later, cells joined together to form more complex cells. And then a billion years later, these more complex cells joined together to form multicellular organisms. These collectives evolved because the participating individuals could, by working together, spread their genetic material in new and more effective ways. Fast-forward another billion years to our world, which is full of social animals, from ants to wolves to humans. The same principle applies. Ant colonies and wolf packs can do things that no single ant or wolf can do, and we humans, by cooperating with one another, have become the earth's dominant species.²³⁷

²³⁵ See Eric Michael Johnson, *Ayn Rand vs. the Pygmies*, SLATE (Oct. 3, 2012, 12:02 AM), http://www.slate.com/articles/health_and_science/human_evolution/2012/10/groups_and_gossip_drove_the_evolution_of_human_nature.single.html [<https://perma.cc/D459-VLS2>] (noting the prevalence of cooperative sanctions to punish and deter harmful selfish behavior).

²³⁶ GREENE, *supra* note 231, at 20; WRIGHT, *supra* note 161, at 190 (quoting GEORGE C. WILLIAMS, ADAPTATION AND NATURAL SELECTION: A CRITIQUE OF SOME CURRENT EVOLUTIONARY THOUGHT 94 (1966)).

²³⁷ GREENE, *supra* note 231, at 20.

The challenge was to turn this cooperative pattern into a natural human instinct so it would not have to be continually relearned. Man's genome made it happen. As humans evolved, so did their capacity to collaborate with others. In fact, this trait tracked the gradual expansion of man's group affiliations—from family relations, to interpersonal encounters with strangers, to social intercourse, and on to institutional and cultural associations. As kinship bonds receded, the urge for cooperation decreased, but the need for mutual understanding only grew stronger. Thus, new adaptations emerged at each level of association.

The problem of family solidarity was rather easily solved. When human beings mate, their genes pass to their children. Thus, the self-interested gene now has two chances at longevity. It can secure its host *and* motivate her to secure her progeny. Because the child remains vulnerable through infancy, the parent feels a natural incentive to protect it.²³⁸ This parental instinct, which marks the first appearance of family cooperation, is boosted by the parent's brain. For example, the neurotransmitting chemical, oxytocin—known as the “cuddle hormone”²³⁹—increases a mother's feeling of “bondedness” with her baby and induces various maternal behaviors, including suckling, warming, cleaning, protecting, and generally obsessing over the child.²⁴⁰ Though men possess lower oxytocin levels than women, they too experience its socializing effects.²⁴¹ Biologically speaking, both sexes are intoxicated by nature's love potion to keep them emotionally invested in their offspring and mates.

It takes more, however, to get people to expand their circles of trust beyond their immediate kin.²⁴² Because strangers do not share genetic material, they do not care for each other the way relatives do. Helping an acquaintance does not feel as urgent as nurturing a child, and given the different gene pool, does not guarantee the helper any genetic benefit. In fact, leaving one's solitude and lending a hand to strangers only depletes the helper's resources, exposes her to the elements, or by encountering the unknown, subjects her to possible harm from the benefactor and her associates.

The key to solving this problem was empathy, the evolved capacity for individuals to see strangers as similar to themselves. An emotional catalyst, empathy emerged from our neural circuitry. Human brains contain mirror neurons with incredible powers of mimicry.²⁴³ As Michael Gazzaniga notes, when one person observes another, the observer unconsciously imitates “the facial expressions, postures, vocal intonations, accents, even speech patterns

²³⁸ See *id.* at 31.

²³⁹ See Stephanie Pappas, *Oxytocin: Facts About the 'Cuddle Hormone.'* LIVE SCI. (June 4, 2015, 6:13 PM), <http://www.livescience.com/42198-what-is-oxytocin.html> [<https://perma.cc/H9KK-P7N6>].

²⁴⁰ See CHURCHLAND, *supra* note 229, at 33.

²⁴¹ See DAVID EAGLEMAN, *THE BRAIN: THE STORY OF YOU* 135-37 (Vintage Books ed. 2017) (describing a study in which men administered oxytocin became more bonded to their partners). As an adjunct, men also carry a bonding agent called arginine vasopressin, or AVP. See CHURCHLAND, *supra* note 229, at 49.

²⁴² See CHURCHLAND, *supra* note 229, at 63, 70-81.

²⁴³ See MICHAEL GAZZANIGA, *WHO'S IN CHARGE? FREE WILL AND THE SCIENCE OF THE BRAIN* 171-74 (2011).

and words of others unconsciously.”²⁴⁴ While such unintentional imitation may not be the sincerest form of flattery, it is ingratiating enough to build rapport. According to Gazzaniga, mimicry forges bonds between the imitator and the person imitated that causes the latter to like, agree with, and generally have smoother interactions with the imitator.²⁴⁵ In short, interpersonal coordination is the first step toward cooperation.

But coordinative imitation does not just attract the party being imitated. It also engages the imitator. Observing another person’s affect stimulates our own emotional system in a corresponding way. For example, one who sees a person in pain will feel the same sort of anxiety about the experience, even though the observer’s body remains unharmed.²⁴⁶ By sharing the emotion, the observer develops a sense of empathy for the sufferer’s plight.²⁴⁷ We can care about the suffering of strangers because it incites a similar suffering in us.

Besides opening our hearts, our mirror neuron system also melds our minds. Indeed, feeling another’s pain is really a type of mind reading.²⁴⁸ As previously noted, all human beings possess a “theory of mind” that permits them to understand the thoughts, goals, and intentions of other people.²⁴⁹ This sense of understanding has a cascading prosocial effect. A person who knows how her competitors think can learn what causes their behaviors. Armed with this information, she can begin to predict how they will react to all sorts of stimuli, including her own behavior.²⁵⁰

Since human beings share the same evolutionary blueprint, they soon realize that people generally behave in similar, predictable ways. Over time, this assurance breeds trust that others will continue to follow these observed patterns.²⁵¹ Once such trust is earned, people are ready to cooperate with strangers, gradually forging relationships that deftly coordinate their penchants and peccadillos. These exchanges eventually turn our expectations of normalcy into binding social “norms,” which elicit a range of emotions that trigger a sense of responsibility. Before long, coordinating behavioral expectations just seems like the *right* thing to do.

3. *Morality*

As this cooperation norm gets passed down through generations, it finally emerges as an automatic moral instinct. When people cooperate with others, they reflexively expect others to cooperate in return. A person who gives or exchanges is spontaneously struck with a feeling of wellbeing.²⁵² Conversely, one who receives largesse subconsciously feels a sense of

²⁴⁴ *Id.* at 175.

²⁴⁵ *See id.*

²⁴⁶ *See id.* at 174; MICHAEL S. GAZZANIGA, *THE ETHICAL BRAIN: THE SCIENCE OF OUR MORAL DILEMMAS* 147 (2009).

²⁴⁷ *See* CHURCHLAND, *supra* note 229, at 148.

²⁴⁸ *See* GAZZANIGA, *supra* note 243, at 171.

²⁴⁹ *See* CHURCHLAND, *supra* note 229, at 134, 137; GAZZANIGA, *supra* note 243, at 26.

²⁵⁰ *See* CHURCHLAND, *supra* note 229, at 132-33, 159.

²⁵¹ *See id.* at 159.

²⁵² WRIGHT, *supra* note 161, at 198.

gratitude and indebtedness.²⁵³ When the recipient fails or refuses to return the favor, we are overcome with anger, resentment, and indignation.²⁵⁴ If cooperating feels good, cheating definitely feels bad. As a result, people impulsively reciprocate cooperation. That urge, in turn, spawns a number of related norms. The notion that one good deed deserves another naturally leads to moral values of sharing and caring, and from there, soon broadens into moral principles of fairness and justice.²⁵⁵

The more these principles successfully promote our survival, the farther they spread. The longer they persist, the more deeply entrenched they become. In time, our selfish genes turned these social norms into basic instincts by encoding them into the very fabric of our being.²⁵⁶ Today, societies everywhere agree that people should treat others with care and respect and that wrongdoers should be punished for their dereliction.²⁵⁷

As satisfying as cooperating may be, it is only a means to the end of winning the competition for survival. Ultimately, *nothing* pleases more than *persistence*. Emotions and hormones for caring create some loyalty to strangers, but they only go so far. If people could find a survival strategy more effective than cooperation, they would use it.²⁵⁸ The most obvious alternative is to cheat. Since cooperation defeats recalcitrant selfishness, selfish free-riding might appear to defeat cooperation. Certainly, if cheaters face no reprisals, cheating would be more attractive than cooperation, which burdens its enrichment with sacrifice.²⁵⁹ But cheating itself can be defeated by cooperative punishment. In fact, punishment serves a dual purpose. In addition to making cheating more costly than cooperation, punishment deters other cheaters and reinforces the norm of reciprocation.²⁶⁰

Effective punishment can take several forms. Informally, cheating is checked by gossip.²⁶¹ Because cooperative societies are based on trust, a person's most important asset is her reputation for trustworthiness. Gossip is both the acid that dissolves that reputation and the reagent that precipitates society's caustic response. Once the cheater's deceit is exposed, her damaged reputation discourages prospective partners.²⁶² If lucky, the culprit is merely shunned by others until she is able to redeem her character.²⁶³ If not, the cheater may be ostracized from the community and denied its cooperative benefits.

²⁵³ See *id.* at 205; Dennis L. Krebs, *The Evolution of a Sense of Morality*, in CREATING CONSCIENCE, *supra* note 47, at 309.

²⁵⁴ See WRIGHT, *supra* note 161, at 198.

²⁵⁵ See Krebs, *supra* note 253, at 309; Jones & Goldsmith, *supra* note 222, at 439-41, 467. See generally Robinson et al., *supra* note 222 (examining the evolutionary, neuroscientific, and psychological bases of justice).

²⁵⁶ See WRIGHT, *supra* note 161, at 189-209.

²⁵⁷ See *id.* at 205; Fruehwald, *supra* note 227, at 209, 219; Jones & Goldsmith, *supra* note 222, at 439-41.

²⁵⁸ See WRIGHT, *supra* note 161 at 195.

²⁵⁹ See CHURCHLAND, *supra* note 229, at 81.

²⁶⁰ See *id.*

²⁶¹ See GREENE, *supra* note 231, at 45-46; WRIGHT, *supra* note 161, at 207.

²⁶² See CHURCHLAND, *supra* note 229, at 81.

²⁶³ See WRIGHT, *supra* note 161, at 208.

Other retributive responses may be more coercive. Physically punishing the cheater in public subjects her to immediate costs and teaches her a memorable lesson. But such violence also may have long-term effects. In small hunter-gatherer societies, most group members will see or hear about the incident. Such conspicuous reprisal directly identifies the punisher as invulnerable and the cheater as untrustworthy, and indirectly discourages others from cheating the punisher or benefitting the cheater.²⁶⁴

As social groups grow, however, general awareness of these punitive episodes necessarily decreases. This informational void is filled by the practice of public grievance. Under this scheme, victims verbally publicize cheating incidents and seek group punishments against their offenders. In so doing, they help to rehabilitate their own reputations, discredit the reputations of reputed cheaters, and strengthen the social bonds of the collective.²⁶⁵ Because group punishment is less risky than personal vengeance, the grievants also enhance their chances of survival.²⁶⁶ No matter which response is chosen, our punitive impulse inevitably helps us coordinate our complementary yet conflicting drives for competition and cooperation.

4. Legality

This coordinative venture becomes increasingly difficult as social groups expand. One of the biggest problems is maintaining an effective system of punishment. Research suggests that people in settlements of between 150 and 200 members generally know each other well enough and interact frequently enough for a system of individual or group punishments to work.²⁶⁷ According to Professor Gazzaniga, this “is the number of people one can keep track of, maintain a stable social relationship with, and would be willing to help with a favor.”²⁶⁸ Beyond this population point, human beings require institutional control.²⁶⁹ That is, society must design cooperative networks to detect, prosecute, and punish uncooperative or anti-cooperative behavior.

Since punishment institutions are really just highly formalized human practices, they will not evolve if they do not satisfy the conditions for human survival. In essence, these institutions consist of experts who are selected by society to serve the collective. To earn respect, institutions must possess the same values as their constituents. Specifically, they must be trustworthy and act according to the shared norms of fairness and justice.²⁷⁰ Yet they also must be capable of maintaining their values by constantly adjusting the rules of fair play. Growing cultures quickly spawn numerous subcultures with their own norms, customs, and coordination practices. The challenge is to reconcile these competing institutions.

²⁶⁴ See *id.* at 205-06.

²⁶⁵ See *id.* at 207-08.

²⁶⁶ See Fruehwald, *supra* note 227, at 211.

²⁶⁷ See GAZZANIGA, *supra* note 243, at 161.

²⁶⁸ *Id.*

²⁶⁹ See *id.*

²⁷⁰ See CHURCHLAND, *supra* note 229, at 64-65.

This institutional concern explains the likely origins of law. One logical conclusion is that human beings developed law to be a supreme social coordinator.²⁷¹ As Professor Gillian Hadfield observes, “Culture is a lot more adaptable than DNA, and as a result humans quickly outcompeted all other animals, making the most of our more agile cognition and language to solve problems and coordinate cooperative strategies for controlling resources.”²⁷² Eventually, however, social diversification caused inter-group alienation, which in turn brought new sorts of culture clashes.²⁷³ Decentralized coordination systems proved too slow and cumbersome to keep pace with these changing social problems.²⁷⁴ In Hadfield’s view, “That’s why humans took the next step and invented law: a deliberate means of choosing and changing the rules” for coordinated living.²⁷⁵

Today, law continues to exist in nearly every society with the same basic structure and content—designed not just to punish wrongdoers, but also to facilitate cooperation in other ways, such as securing property rights, regulating exchange transactions, and providing for the distribution of resources.²⁷⁶ Under this evolutionary perspective, our legal institutions persist, like mankind itself, for two simple reasons: they succeed in stabilizing human relations,²⁷⁷ and, because of that success, they are embraced by culture and transmitted by each generation of competitive cooperators to the next.²⁷⁸

Stepping back from this revolving cycle, a strikingly familiar pattern quickly emerges. The genetic solution to man’s survival problem is sociocultural homeostasis.²⁷⁹ Indeed, the adaptations just discussed fulfill the same coordinative function as our inner homeostatic system. Using Professor Damasio’s cogent analogy, these survival strategies

respond to a detection of imbalance in the life process, and they seek to correct it within the constraints of human biology and of the physical and social environment. The elaboration of moral rules and laws and the development of justice systems responded to the detection of imbalances caused by social behaviors that endangered individuals and the group. The cultural devices created in response to the imbalance aimed at restoring the equilibrium of individuals and of the group.²⁸⁰

So viewed, law is but a higher-level system of coordination dynamics. Just as biological homeostasis maintains metabolic metastability, sociocultural homeostasis promotes group metastability by setting boundary

²⁷¹ See *id.* at 64-65, 202-03.

²⁷² GILLIAN K. HADFIELD, RULES FOR A FLAT WORLD: WHY HUMANS INVENTED LAW AND HOW TO REINVENT IT FOR A COMPLEX GLOBAL ECONOMY 6 (2017).

²⁷³ See *id.* at 70.

²⁷⁴ See *id.*

²⁷⁵ *Id.*

²⁷⁶ See Jones & Goldsmith, *supra* note 222, at 465-75.

²⁷⁷ See Churchland, *supra* note 229, at 202-203.

²⁷⁸ See *id.* at 64-65.

²⁷⁹ See Antonio Damasio, SELF COMES TO MIND: CONSTRUCTING THE CONSCIOUS MIND 309-12 (2010).

²⁸⁰ *Id.* at 310.

conditions for competition and cooperation and reconciling these tendencies as patterns of human interaction ebb and flow.

We will take a closer look at the sociological and cultural sides to this story in a moment. In the following section, however, we must return to the base of the Knowledge Tree. Before evolution shaped our social practices, it equipped our brains to meet the survival challenge. The burgeoning field of neuroscience shows us how.

B. NEUROSCIENCE

Though our genome creates a broad blueprint for human flourishing, it does not implement that plan on a daily basis. Such dirty work is left to our brains. According to Professor Damasio, “the overall function of the brain is to be well informed about what goes on in the rest of the body—the body proper; about what goes on in itself; and about the environment surrounding the organism, so that suitable, survivable accommodations can be achieved between organism and environment.”²⁸¹ In short, the brain exists to serve and protect the body. “If there had been no body,” Damasio quips, “there would have been no brain.”²⁸² Yet the brain cannot help its host without first resolving its own inner conflicts. Because of its modular structure, the brain contains two competing modes of operation. The resulting dual process system is complex but not refractory. Assisted by coordination dynamics, the brain unifies its forces to solve the bigger problems of survival.

1. Values

The brain is the body’s chief executive officer, its human resources director, and its public relations manager all in one. It does not just command the body; it coheres the body’s constituents and controls the body’s interrelationship with its surroundings.²⁸³ As we noted earlier, brain and body constitute an indissociable organism “integrated by mutually targeted biochemical and neural circuits”²⁸⁴ and “interact[ing] with the environment as an ensemble, [and not through] the body [or] the brain alone.”²⁸⁵ But, as Eagleman explains, this association “needs a CEO to stay above the daily details and to craft the long view of the company.”²⁸⁶ The brain’s consciousness serves this function. It “is a way for the billions of cells to see themselves as a unified whole, a way for a complex system to hold up a mirror to itself.”²⁸⁷

This bio-corporate ensemble surely is an existential thing, yet it is not agnostic about its purpose. It is a thing of material value. Like genes, brains value survival and well-being.²⁸⁸ Thus, they tell bodies what they ought to do to stay alive. Bodies should seek sustenance and security and avoid

²⁸¹ DAMASIO, *supra* note 138, at 90.

²⁸² *Id.* at 90.

²⁸³ See EAGLEMAN, *supra* note 241, at 100.

²⁸⁴ *Id.* at 87.

²⁸⁵ *Id.* at 88.

²⁸⁶ *Id.*

²⁸⁷ *Id.*

²⁸⁸ See CHURCHLAND, *supra* note 229, at 30, 189.

obvious dangers. They should abide feelings of satisfaction that come with caring and sharing, and heed feelings of pain and anxiety that arise when they are threatened or harmed. Though they should compete for necessities, they should cooperate to obtain them. As Professor Churchland notes,

The truth seems to be that the values rooted in the circuitry for caring—for well-being of self, offspring, mates, kin, and others—shape social reasoning about many issues: conflict resolution, keeping the peace, defense, trade, resource distribution, and many other aspects of social life in all its vast richness.²⁸⁹

Consequently, “[r]elative to these values, some solutions to social problems are better than others, *as a matter of fact*.”²⁹⁰

The brain puts these values to work as it navigates the body through its environment. This process begins when the brain receives sensory data from the outside world and mixes it with emotions and memories emitted from within. As described previously, these cognitions are then assembled into meaningful concepts, which in turn are combined into distinctive patterns representing important features of reality.²⁹¹ After the perceived patterns are matched against the mind’s preexisting stock of categories, the brain makes an identification or manufactures a new category to fit the novel facts.²⁹² Once the pattern is recognized, the brain applies its survival values to assess its desirability and instructs the body to either approach or withdraw, or acquire or abstain.²⁹³

Of course, values do not always yield decisive judgments. Our norms can vary in clarity and intensity and even come into conflict. So while our cooperation ethic may inspire heroic deeds of altruism, our instinct for self-preservation may counsel cautious detachment and restraint. The choice between these alternatives is not just a simple matter of pattern matching. It is the product of a complex reconciliation system founded on complementarity and coordination dynamics.

2. Modularity

The brain’s complementarity derives from its architecture. Indeed, coordinated contradiction has been hardwired into man’s cognitive apparatus throughout the course of human existence. According to physician and neuroscientist Paul MacLean, human beings possess a “triune brain.”²⁹⁴ Our triune brain consists of three nested structures: the hindbrain or reptilian brain, the midbrain or paleomammalian brain, and the forebrain or neomammalian brain.²⁹⁵ Today, these structures appear early in our life

²⁸⁹ *Id.* at 8.

²⁹⁰ *Id.* at 9 (emphasis in original).

²⁹¹ See *supra* text accompanying notes 135-139.

²⁹² See Grossberg, *supra* note 114, at 237-39.

²⁹³ See Haidt, *supra* note 233, at 123.

²⁹⁴ See Paul D. MacLean, THE TRIUNE BRAIN IN EVOLUTION: ROLE IN PALEOCEREBRAL FUNCTIONS 13-18 (1990).

²⁹⁵ See Gerald A. Cory, Jr., THE CONSILIENT BRAIN: THE BIONEUROLOGICAL BASIS OF ECONOMICS, SOCIETY, AND POLITICS 9-11 (2004); Wilson, *supra* note 27, at 116-17; Wright, *supra* note 161, at 321.

history, forming in human fetuses by week four as three bulges connected to the end of a neural tube.²⁹⁶ But this was not always true. Like our genes, our brains evolved so we could adapt to changing circumstances. This process was accretive and progressive, with each new structure adding a layer of complexity over its predecessors. Thus, the reptilian hindbrain was encased by the mammalian midbrain, which then was enveloped by the human forebrain.²⁹⁷ Though these strata developed for different purposes, they were—and still are—highly consilient, interconnecting and interacting with each other to form a cohesive command center.

Ironically, such cohesion evolved from incompatibility. The hindbrain first appeared in reptiles and our ancestral vertebrates purely as a self-preservation mechanism.²⁹⁸ Sitting atop and including part of the brain stem, the hindbrain regulates the systems necessary for life, like blood circulation, heartbeat, respiration, hunger, and reproduction.²⁹⁹ These genetically controlled vessels produce instinctive behaviors like aggression, dominance, and territoriality.³⁰⁰ As neuroscience contributor, Gerald Corey Jr. remarked, “From the mainly survival-centered promptings of these ancestral circuits, as elaborated in our human brain, arise the motivational source for egoistic, surviving, self-interested subjective experience and behaviors.”³⁰¹ By way of vivid analogy, Corey continues, “Here we have the cold-blooded, seemingly passionless, single-minded, self-serving behaviors that we have generally associated with the present-day lizard, the snake, and that most maligned of fishes, the shark.”³⁰²

Over time, a class of reptiles evolved into warm-blooded mammals. Mammals differed from reptiles in two important respects. Unlike reptiles, which generated large quantities of eggs, mammals produced few offspring.³⁰³ As a result, mammalian parents could not roam as freely as their reptilian predecessors. Instead, they needed to safeguard and nurture their brood to ensure their survival. Moreover, since mammalian families stayed together longer, they also tended to live around each other more frequently. Consequently, they needed to find a mutually beneficial means of cohabitation.

The midbrain, or limbic system, grew around the hindbrain to address these evolutionary challenges.³⁰⁴ While still instinctive, the midbrain’s operations are virtually the polar opposites of its more primitive counterpart. In fact, the two brain regions appear to be fixed at cross-purposes. Whereas the hindbrain thinks only about itself, the midbrain thinks about the self’s relationships with others. The midbrain is not cold and selfish, but emotional and social. By emitting the love hormone oxytocin, it stimulates maternal

²⁹⁶ See GAZZANIGA, *supra* note 246, at 26.

²⁹⁷ See CORY, JR., *supra* note 295, at 11.

²⁹⁸ See *id.* at 10.

²⁹⁹ *Id.* at 11.

³⁰⁰ See MACLEAN, *supra* note 294, at 15.

³⁰¹ CORY, JR., *supra* note 295, at 12.

³⁰² *Id.* at 12.

³⁰³ See *id.*

³⁰⁴ See *id.*

bonding and child care.³⁰⁵ Its circuits for learning and memory promote empathy and trust, thus extending cooperation beyond kin to complete strangers. If the hindbrain wants us to fight or flee, the midbrain just wants us all to get along.

Together, the midbrain and hindbrain imbue us with a cranial complementarity. We say we approach problems with our hearts or our minds, but it is truly a mixture of both. As Cory puts it, the human brain is “a world in which nearly single-minded self-preservation is simultaneously complemented and counterpoised by the conflicting demands of affection.”³⁰⁶ Our mental inner tension makes us curiously discordant creatures. Left unattended, our opposed impulses might lead to debilitating neuroses or even self-destruction. So our brains adapted to ease the unrest.

The forebrain emerged as the mind’s main mediator.³⁰⁷ Composed of the cerebral neocortex, the forebrain is the source of our distinctly human capacities for abstract thought and rational decision making.³⁰⁸ Indeed, it is the neural underpinning of all our higher functions, including language use, planning, generalization, introspection, and consciousness.³⁰⁹ Though not a homunculus, the forebrain communicates with and coordinates the brain’s competing substrates, and—when necessary—helps us resolve our internal and external conflicts.³¹⁰ Strangely, this very feature also places the forebrain at odds with its older and lower components, meeting their reflexive desires with its own deliberative logic. But because the parts are symbiotic, the brain’s fore-and-aft cognitions actually form a perfect complementary pair.

In fact, the recent trend in neuroscience is to condense MacLean’s triune brain into a dual module system³¹¹ coordinated by a dynamic interpreter.³¹² Scholars describe the brain modules in creative and divergent ways, including emotional and rational,³¹³ automatic and deliberate,³¹⁴ right and left brain,³¹⁵ low road and high road,³¹⁶ hot and cold,³¹⁷ go and know,³¹⁸ and my personal favorite, Jonathan Haidt’s the elephant and the rider.³¹⁹ But behind all these accounts is the same complementary nature—one brain process is instinctive and intuitive, while the other is calculated and logical.

³⁰⁵ See *id.* at 11.

³⁰⁶ *Id.* at 12 (emphasis deleted).

³⁰⁷ See *id.* at 15 n.3.

³⁰⁸ See MACLEAN, *supra* note 294, at 17.

³⁰⁹ See CORY, JR., *supra* note 295, at 15-18.

³¹⁰ See *id.* at 16-18; PARDO & PATTERSON, *supra* note 37, at 73-74.

³¹¹ See GAZZANIGA, *supra* note 246, at 235-36; HAIDT, *supra* note 233, at 53-55; 58-59; Brian Fiala et al., *On the Psychological Origins of Dualism: Dual Process Cognition and the Explanatory Gap*, in CREATING CONSILIENCE, *supra* note 47, at 89-90.

³¹² Michael Gazzaniga calls this coordinating element the “Left Hemisphere Interpreter.” GAZZANIGA, *supra* note 243, at 81-112; GAZZANIGA, *supra* note 246, at 235-41.

³¹³ See PARDO & PATTERSON, *supra* note 37, at 73-74.

³¹⁴ See Fiala et al., *supra* note 311, at 90.

³¹⁵ See CORY, JR., *supra* note 295, at 17.

³¹⁶ See Fiala et al., *supra* note 311, at 91.

³¹⁷ See GAZZANIGA, *supra* note 134, at 270-71.

³¹⁸ See *id.*

³¹⁹ See HAIDT, *supra* note 233, at xiv, 58-59.

Although both processes are cognitive³²⁰—helping us manage the deluge of information that floods our minds—the intuitive elephant is the more powerful force. According to Haidt, “[t]he rider is our conscious reasoning—the stream of words and images of which we are fully aware” and “[t]he elephant is the other 99 percent of mental processes—the ones that occur outside of awareness but that actually govern most of our behavior.”³²¹ When the elephant reacts to its environment and begins charging down a behavioral path, options for steering are limited. Indeed, the rider becomes more of a guide than a driver. Under Haidt’s brain metaphor, “the rider’s job is to serve the elephant.”³²² Reason can tug at the reigns to negotiate the turns but instinct is difficult to harness. “Elephants rule,” Haidt declares, “although they are sometimes open to persuasion by riders.”³²³

3. Dynamics

Without some assistance, these contentious collaborators could easily get their signals crossed. To prevent this from happening, the anterior cruciate cortex (ACC) of the brain’s left hemisphere recognizes, interprets, and moderates the conflict.³²⁴ The recognition and interpretation functions come first. Dubbed the “left hemisphere interpreter” by Michael Gazzaniga, the ACC immediately “makes strange input logical”³²⁵ by taking cognitions “that do[] . . . not jibe with our self-image, knowledge, or conceptual framework” and “creat[ing] a belief to enable all incoming information to make sense and mesh with our ongoing idea of ourself[ves].”³²⁶ With these beliefs in place, the interpreter weaves them into a personal narrative, unifying our psychological experience and establishing our sense of individual consciousness.³²⁷ That story, however, is not just an autobiography; it is a judicial opinion adjudicating a mental dispute.³²⁸

In fact, our left-brain interpreter is really a consummate lawyer. It seeks to explain everything, even with negligible information.³²⁹ When no explanatory script is available, it fabricates a story to fill the void.³³⁰ Should the interpreter’s account be questioned, it responds with persuasive arguments. The more it is pressed, the more vigorously it defends its position.³³¹ Indeed, Robert Wright goes so far as to call the brain “a machine for winning arguments, a machine for convincing others that its owner is in

³²⁰ *Id.* at 51.

³²¹ *Id.* at xvi.

³²² *Id.* (emphasis omitted).

³²³ *Id.* at 64.

³²⁴ See PARDO & PATTERSON, *supra* note 37, at 73-74; see also GAZZANIGA, *supra* note 246, at 148 (“Yet even though our brain carries out all these functions in a modular system, we do not feel like a million little robots carrying out their disjointed activities[;] [rather,] [w]e feel like one, coherent self with intentions and reasons for what we feel are our unified actions.”).

³²⁵ GAZZANIGA, *supra* note 246, at 148.

³²⁶ *Id.* at 151.

³²⁷ See *id.* at 236, 238.

³²⁸ See PARDO & PATTERSON, *supra* note 37, at 73-74.

³²⁹ See HAIDT, *supra* note 233, at 55.

³³⁰ See GAZZANIGA, *supra* note 243, at 91.

³³¹ GAZZANIGA, *supra* note 246, at 238.

the right—and thus a machine for convincing its owner of the same thing.”³³² Because cooperation is essential to survival, persuasion is the brain’s way of winning friends and earning favors. “Like a lawyer,” Wright muses, “the human brain wants victory, not truth; and like a lawyer, it is sometimes more admirable for skill than for virtue.”³³³ As a lawyer myself, I would say that the brain maintains a fiduciary relationship with its human client, and in exercising its professional duties, zealously advocates for her best interests. Either way one argues the point, there is no argument against the brain’s predilection for argumentation.

The real debate until recently is *how* that polemical process takes place. One view holds that the brain operates as a collection of local regions performing distinctly different functions.³³⁴ Another theory says the brain is a highly integrated organ that functions globally, with no specific task assigned to any specific brain domain.³³⁵ But a growing school believes our cerebral system is simultaneously segregated *and* integrated. It is, in essence, a union of conflicting but complementary processes syncretized by coordination dynamics—the self-organizing patterns of instability, stability, and metastability within and between complex systems.

Not surprisingly, this neural network functions just like the creatures it controls. As a person interacts with her environment, her brain is deluged by waves of informational signals—like images, smells, tastes, tactile impressions, emotions, memories, and ideas—that constantly compete for attention.³³⁶ These signals rise and recede in strength depending on their sensory salience and the brain’s own cognitive predispositions.³³⁷ The strongest signals intensify, cluster, and combine into larger neural coalitions. Eventually, the dominant impulses squelch their competitors, effectively compelling the brain to take notice.³³⁸ Having captured the host’s attention, the victorious signals begin to influence other brain operations.³³⁹ If sufficiently powerful, they will initiate and direct the host’s behavior.³⁴⁰ Especially strong signals also heighten the host’s awareness or consciousness of the experience.³⁴¹ The more the host ponders the event, the sharper her attention is drawn to its impetus. The result is a mutually reinforcing resonance cycle. As Professor Graziano explains, “Awareness is not merely watching, but plays a role in directing brain function.”³⁴² Specifically, “Your own awareness . . . is locked in a positive feedback loop with your own attention,” with attention enhancing awareness, and awareness continually focusing attention.³⁴³

³³² WRIGHT, *supra* note 161, at 280.

³³³ *Id.*; GAZZANIGA, *supra* note 134, at 264.

³³⁴ *See* KELSO & ENGSTRØM, *supra* note 32, at 143.

³³⁵ *See id.*

³³⁶ *See* GRAZIANO, *supra* note 147, at 23, 25, 50-51, 60-61.

³³⁷ *See id.* at 23, 50-51.

³³⁸ *See id.* at 50-51.

³³⁹ *See id.* at 23.

³⁴⁰ *See id.* at 23, 61.

³⁴¹ *See id.* at 36-37.

³⁴² *Id.* at 37.

³⁴³ *Id.* at 103.

The coordinative and dynamic nature of human brain function is now recognized, and imaginatively portrayed, by an impressive list of influential experts.³⁴⁴ Of these illuminati, neuroscientist Michael Gazzaniga, offers perhaps the most cogent explanation of our complex neural system. Without invoking the term, Gazzaniga describes the full range of coordination dynamics behind our mysterious thought process:

The view in neuroscience today is that consciousness does not constitute a single, generalized process. It is becoming increasingly clear that consciousness involves a multitude of widely distributed specialized systems and disunited processes, the products of which are integrated in a dynamic manner by the interpreter module. Consciousness is an emergent property. From moment to moment, different modules or systems compete for attention and the winner emerges as the neural system underlying that moment's conscious experience. Our conscious experience is assembled on the fly, as our brains respond to constantly changing inputs, calculate potential courses of action, and execute responses like a streetwise kid.³⁴⁵

While such neural activity may be spontaneous, it is not entirely chaotic. As noted earlier, brains come prewired with genetic instincts and predispositions. Over time, these boundary conditions frame the patterns of our cognition. We view cheaters as undesirables because their noncooperation reflexively fills us with anger and disgust. Eventually, these urges beget deep psychological appetites that influence our social behavior. As we interact with others, our beliefs and ideas influence our neighbors, just as their worldviews influence us. Before long, these social dynamics turn into cultural traditions—like morality and legality—which get passed on from one generation to the next. Guided by natural selection, such traditions gradually become heritable traits that revise our evolving genome by reinforcing its coordinative telos. Because the movement from appetites to epigenetics completes the circuit of man's complex system and brings us to the brink of law, it requires a much closer look.

IV. APPETITES TO EPIGENETICS

The automated part of cognition is designed by evolution to help guide us toward things valuable for survival. We may choose to abide or ignore these instincts, but even these decisions are not totally willful. They are shaped by powerful psychological forces and informed by society and

³⁴⁴ See CORY, JR., *supra* note 295, at 20, 21 & n.9 (observing that “[t]he two master programs of self-preservation and affection” within the brain are “locked in inseparable unity” to form a motivational and behavioral spectrum that continuously blends both tendencies without ever reaching either extreme); DAMASIO, *supra* note 279, at 310 (noting that brain states move “high, then low, then high, in an oscillatory course that frequently flirts with chaos but barely avoids it”); EAGELMAN, *supra* note 241, at 108 (analogizing the brain to a city in that its “overall operation emerges from the networked interaction of its innumerable parts”); EDELMAN *supra* note 133, at 30 (comparing brain dynamics to a string quartet whose body parts are connected by very fine threads); KELSO & ENGSTRÖM, *supra* note 32, at 149 (describing brain function as a “Balanchine ballet”); WILSON, *supra* note 27, at 120 (commenting that “[t]he mind is a self-organizing republic of scenarios that individually germinate, grow, evolve, disappear, and occasionally linger to spawn additional thought and physical activity”).

³⁴⁵ GAZZANIGA, *supra* note 243, at 110 (footnotes omitted).

culture. Together, these internal and external influences enrich our sense of right and wrong. Although our normative sensibility infiltrates our social relationships, it plays an especially significant role in stimulating our feeling of lawfulness. Thus, to fully understand the cultural artifact of law, we must take two more steps up the Knowledge Tree, stopping first at psychology—which illuminates our mental appetites—and proceeding on to sociology and anthropology, which explain man’s epigenetic acculturation.

A. MORAL AND DEVELOPMENTAL PSYCHOLOGY

Psychology, or the study of human mind and behavior, is the natural bridge between the natural and social sciences.³⁴⁶ Historically, neuroscience examined the physical structures and systems of the brain, but paid little attention to our mental content—our hopes, dreams, desires, ideas, motives, feelings, etc.—and even less to the mind’s behavioral relationship to society. By contrast, sociology focused on man’s specific social behaviors and institutions, but generally avoided their genetic or neurological causes. Although consilience has blurred these lines, psychology has been the key facilitator. Psychology concerns *both* the human mind *and* the natural world. In fact, psychology is the mind’s participation *in* the world; or as Tooby and Cosmides put it, “The stuff of the mind *is* the stuff of the world.”³⁴⁷ Like the world, our psyches suffer from an inner conflict among a host of competing forces. Yet these mixed signals are not irreconcilable. By syncretizing our psychological appetites, our minds help us meld with the people and things around us.

1. Schisms

The human psyche, like the human brain from which it emerges, has something of a split personality. To explain why, we must start in a rather unlikely place: the largely unempirical, and still controversial, psychology of Sigmund Freud. Long before neuroscience reached its heyday, Freud had deconstructed man’s mentality. According to Freud’s structural model, the human psyche is divided into three distinct parts. Remarkably, these parts correspond closely to the evolutionary layers of MacLean’s triune brain. More stunning still, Freud developed his trilogy solely through analytic speculation, and presented it nearly a half-century before MacLean posited his highly empirical theory of the brain.

Freud argued that the mind consists of the id, the ego, and the super-ego, a constantly coordinating mix of forces that fuel our behavior.³⁴⁸ The id, which emanates from the reptilian hindbrain, is the source of our emotional and instinctual drives. Operating according to the pleasure principle, the id seeks immediate gratification of our wants and needs, including our

³⁴⁶ See Henriques, *supra* note 28, at 176; Ingold, *supra* note 117, at 36-37; Tooby & Cosmides, *supra* note 86, at 63-65.

³⁴⁷ Tooby & Cosmides, *supra* note 86, at 72-73 (emphasis added).

³⁴⁸ SIGMUND FREUD, THE EGO AND THE ID 11-62 (James Strachey, ed., Joan Riviere, trans. 1989); see generally Stephen P. Thornton, *Sigmund Freud*, in INTERNET ENCYC. PHIL., <http://www.iep.utm.edu/freud/> [<https://perma.cc/B4KV-TJDX>] (discussing Freud’s tripartite theory of personality).

conflicting impulses for survival and destruction.³⁴⁹ The super-ego, by contrast, serves as our conscience. A product of the neomammalian forebrain, the super-ego works in contradiction to the id, applying abstract reason to establish the individual's concepts of right and wrong and punishing misbehavior with feelings of guilt.³⁵⁰ The ego referees the inner competition between these opposed influences. Guided by an urge for social harmony, the ego acts primarily as our left-brain interpreter, coordinating our selfish drives with the realities of the external world. So even as it relieves the id's libidinal urges in socially acceptable ways,³⁵¹ it also satisfies the principled demands of the super-ego, which continually subject it to moral judgment.³⁵²

Although many of Freud's psychological propositions have since been proven wrong,³⁵³ his account of the human mind dovetails substantially with later scientific findings. Besides anticipating triune brain theory, Freud's approach captures the dialectical relationship among competing brain components only recently adduced by neuroscience, coordination dynamics, and the behavioral investment theory of psychology.³⁵⁴ Thus, while Freud's—and even MacLean's—work is now less fashionable, neuroscientist David Eagleman affirms that “the heart of [their] idea survives: brains are made of competing subsystems” that define our conflicted psyches.³⁵⁵

Even so, science has taken moral psychology well past Freud. In fact, research from developmental psychology indicates that man's moral metamorphosis is not just an evolutionary progression carried on over the course of many millennia. It also is an ontogenetic process unfolding over the life of every person. Though Jean Piaget first proposed this theory,³⁵⁶ it later was expanded and refined by psychologist Lawrence Kohlberg. In his provocative version, Kohlberg argued that people everywhere mature in several predictable stages of moral development, with each “higher” stage being more morally sophisticated than the one below.³⁵⁷ Although Kohlberg identified three developmental stages, each stage actually contained both a basic and an advanced level.

The first “preconventional” stage begins at birth and applies mostly to young children.³⁵⁸ In this early period, the child manifests a selfish attitude towards others and defers only to established authority figures.³⁵⁹ The

³⁴⁹ See FREUD, *supra* note 348, at 37-39; Jean Roiphe, *Aggression, Unconscious Conflict, and the Role of the Lawyer*, 16 CARDOZO L. REV. 1205, 1207 (1995).

³⁵⁰ See FREUD, *supra* note 348, at 30-33.

³⁵¹ See *id.* at 19; Roiphe, *supra* note 349, at 1207-08.

³⁵² See Roiphe, *supra* note 349 at 1207.

³⁵³ See Henriques, *supra* note 28, at 164.

³⁵⁴ See *id.* at 165-66.

³⁵⁵ EAGLEMAN, *supra* note 129, at 110.

³⁵⁶ See Mark Tappan et al., *Heteronomy and Autonomy in Moral Development: Two Types of Moral Judgments*, in 1 ANNE COLBY & LAWRENCE KOHLBERG, *THE MEASUREMENT OF MORAL JUDGMENT: THEORETICAL FOUNDATIONS AND RESEARCH VALIDATION* app. at 332-36 (1987) (discussing Piaget's developmental approach).

³⁵⁷ See COLBY & KOHLBERG, *supra* note 356, at 9.

³⁵⁸ See *id.* at 16 (noting that this stage applies to most children under age nine).

³⁵⁹ See *id.* at 18-19 & Table 1.1.

preconventionalist's main objectives are to restrain her natural drives, obey authoritative rules, and avoid punishment for noncompliance.³⁶⁰ Since people are seen largely as objects, successful social interaction consists essentially of noninterference with the bodies or property of others.³⁶¹ As the child progresses through this stage, she begins to recognize different points of view, but continues to give her own interests top priority. Though she increasingly interacts with others, she does so primarily to secure some sort of personal gain.

By the age of adolescence or early adulthood, most human beings progress to Kohlberg's second, or "conventional," stage of development.³⁶² Here, the individual mainly seeks to please others and fulfill desirable social roles. Rather than competing with her contemporaries, the conventionalist yearns for connection, cooperation, and conformity. As her interpersonal relationships expand into larger social networks, she agrees to live by an empathic Golden Rule of respect, trust, gratitude, and loyalty.³⁶³ Eventually, these relational sentiments generate a broader sense of social responsibility, instilling in each member a strong fidelity to the community's values, customs, and duties.³⁶⁴

Some but not all people will go one step further.³⁶⁵ Heeding the call of their consciences, they begin to live by higher principles. At this "postconventional" stage, the individual first strives to integrate and synthesize competing legal and moral points of view by appealing to accepted coordination mechanisms like the Lockean social contract or our system of liberal democracy.³⁶⁶ In time, she recognizes that some values—such as liberty, equality, dignity, and justice—are greater than any conventional laws, including those that are properly promulgated by legitimate public representatives.³⁶⁷ Because these endowments are fundamental human rights, they necessarily take precedence in cases of conflict.³⁶⁸

Kohlberg's thesis certainly is not beyond criticism. It glorifies traditional Western values and overestimates moral consistency across persons and cultures.³⁶⁹ More fundamentally, it grounds moral development on formal reasoning and overlooks intuition or emotion.³⁷⁰ Yet his ideas have an indisputable resonance. Though recent research modifies Kohlberg's paradigm and clarifies some of its parameters, modern psychology reinforces his revelation about the conflicted forms of human morality.

³⁶⁰ *See id.*

³⁶¹ *See id.*

³⁶² *See id.* at 16.

³⁶³ *See id.* at 18-19 & Table 1.1.

³⁶⁴ *See id.*

³⁶⁵ *See id.* at 16 (noting that this stage is reached by a minority of adults and usually only after the age of twenty to twenty-five).

³⁶⁶ *See id.*

³⁶⁷ *See id.* at 18-19 & Table 1.1.

³⁶⁸ *See id.*

³⁶⁹ *See* HAIDT, *supra* note 233, at 15-20, 24-26, 33-39, 77-83.

³⁷⁰ *Id.*

2. *Sentiments*

The current consensus is that we are of two—not three—moral minds and they coexist within us from birth. We now know that by age three, children consistently distinguish between moral and conventional rules.³⁷¹ Apparently, kids see a critical difference between the rules' respective sources of authority. Conventional rules are externally enforced by power figures who back their commands with threats of punishment.³⁷² Roughly paralleling Kohlberg's pre-conventional and conventional morality, such rules depend on fear, self-interest, and social suasion and not on fairness or emotional appeal.³⁷³ Consequently, children who violate conventional rules generally feel few qualms about their infractions and consider their misdeeds to be relatively benign.³⁷⁴

Moral rules are qualitatively different. They do not originate from outside sources, even if they may be taught and enforced by authority figures. Instead, they arise internally from the child's innate set of values. In Michael Gazzaniga's colorful words, we are equipped at "the baby factory" with a number of important moral sentiments, "including a sense of fairness, reciprocity, and punishment."³⁷⁵ Supporting this view, psychologist Marc Hauser says these sentiments are metaphorically secreted by a heritable "moral organ" that functions at birth and continues to develop throughout our lives.³⁷⁶ Together, our moral rules form a "homeostatic cluster" of intuitions necessary for human flourishing.³⁷⁷

Sensing this fundamental quality, kids view moral rules as special, serious, imperative, and universal.³⁷⁸ Although such higher principles align well with those in Kohlberg's post-conventional stage of development, they do not arise incrementally or cognitively. Rather, they are emotional switches embedded in our brains by natural selection.³⁷⁹ We may rationalize and respond to these emotions more as we mature, as Kohlberg suggests, but they guide our behavior from the very beginning. Thus, in infants and adults alike, any breach of this covert moral code instantly flips our switches, ignites our passions, and fills us with feelings of indignation, offense, or disgust.³⁸⁰

These sentimental rules are neither random nor fickle. After studying people all over the world, psychologist Jonathan Haidt concluded that human beings share six moral tastes or appetites.³⁸¹ Framed as binary oppositions (favoring one value while simultaneously disfavoring its opposite), mankind's appetites include (1) care/harm; (2) liberty/oppression; (3) fairness/cheating; (4) loyalty/betrayal; (5) authority/subversion; and (6)

³⁷¹ See SHAUN NICHOLS, SENTIMENTAL RULES: ON THE NATURAL FOUNDATIONS OF MORAL JUDGMENT 9-10, 18 (2004); Stich, *supra* note 91, at 290.

³⁷² See HAIDT, *supra* note 233, at 11.

³⁷³ See NICHOLS, *supra* note 371, at 5-7, 25.

³⁷⁴ See *id.*; Stich, *supra* note 91, 290-91.

³⁷⁵ GAZZANIGA, *supra* note 243, at 225.

³⁷⁶ See CHURCHLAND, *supra* note 229, at 104-05 (discussing HAUSER, *supra* note 228).

³⁷⁷ Stich, *supra* note 91, at 291.

³⁷⁸ See HAIDT, *supra* note 233, at 12.

³⁷⁹ See CHURCHLAND, *supra* note 229, at 104-105.

³⁸⁰ See NICHOLS, *supra* note 371, at 5-7, 25.

³⁸¹ See HAIDT, *supra* note 233, at 133.

sanctity/degradation.³⁸² Each appetite developed as an adaptive solution to one of the core survival problems mentioned earlier. As a result, people everywhere seem to crave the same basic necessities: to care for themselves and kin and avoid inflicting physical harm; to maintain their independence while resisting domination by others; to reap the benefits of cooperation and punish exploitation and deception; to form and maintain coalitions but exclude those who are disloyal or untrustworthy; to forge beneficial hierarchies within groups and use rank and status to regulate behavior; and to value cleanliness and purity for health and safety reasons, but also as a means of spiritual development.³⁸³ Cultures might stress some values more than others, just as a person might prefer salty foods to sweets,³⁸⁴ but everyone is born with essentially the same moral taste buds.

Other thinkers have reduced Haidt's appetites into an even shorter list of categories. For example, anthropologist Richard Shweder has identified three innate moral sensibilities: the ethic of autonomy, the ethic of community, and the ethic of divinity.³⁸⁵ The ethic of autonomy roughly covers Haidt's appetites for harm avoidance and liberty; the ethic of community subsumes Haidt's appetites for fairness, loyalty, and authority; and the ethic of divinity addresses Haidt's taste for sanctity. Perhaps even more notably, this condensed list begins to mirror the other trilogies defining the human condition, with autonomy evoking our automated, competitive self-interest; community reflecting our intuitive, cooperative social nature; and divinity hinting at man's quest for rational coherence and corporeal transcendence.

3. *Syncretism*

This concatenation of antagonistic impulses leaves psychology with the same coordination problem facing the other disciplines further down the Knowledge Tree. In this context, the critical question is how the mind gets from mental mayhem to metastability. The psychological response here picks up where neuroscience leaves off. According to brain science, our neural network operates in automatic and manual modes, with some thoughts arising spontaneously and others being created through deliberation. Psychology examines the cognitions behind these neural mechanics. It seeks to know not just how the elephant and rider interact, but more importantly, what makes them tick.

The catalysts behind the pair's unsteady relationship are emotion and reason. Our automated intuitions give us immediate ideas but not necessarily an impetus to act. When an intuition is fueled by an emotion like anger or fear, however, it propels our minds to react in a manner preselected by evolution for its past successes.³⁸⁶ Once the elephant gets going, the rider's

³⁸² See *id.* at 149, 178-79.

³⁸³ See *id.* at 152-79.

³⁸⁴ See *id.* at 133.

³⁸⁵ Richard A. Shweder et al., *The "Big Three" of Morality (Autonomy, Community, and Divinity), and the "Big Three" Explanations of Suffering*, in *MORALITY AND HEALTH* 119-69 (A. Brandt & P. Rozin eds., 1997); GAZZANIGA, *supra* note 134, at 238.

³⁸⁶ See GREENE, *supra* note 231, at 135; HAIDT, *supra* note 233, at 52-53.

role begins. Our instinctive moral response is open to manual review by our faculties of reason. Given the power of this emotive force, our minds summon reason to inhibit or justify our intuition.³⁸⁷

Guided by the left-brain interpreter, we mediate both our internal conflicting drives and our external encounters with others, inhibiting our most damaging or uncooperative urges and explaining the benefits of our unrestricted actions.³⁸⁸ According to psychologist Gregg Henriques, this mediation process works very much like the Freudian ego or a tenacious defense attorney, rationalizing our conduct “in a manner that others will both believe and respond to favorably.”³⁸⁹ While our inner lawyer often loses to her libidinal opponent, she sometimes wins her case, either by marshaling countervailing intuitions and emotions or by soliciting emotionally appealing arguments from other trusted people.³⁹⁰

Until recently, the mind’s complex dynamics prevented us from ever predicting a victor in the debate between emotion and reason or between emotional and rational morality. But new research now helps us set the odds. Joshua Greene studied the brains of people presented with the famous Trolley Problem. In this thought experiment, subjects are told that a runaway train is headed for five railroad employees working on the tracks. The participants are then asked to mentally insert themselves into the scenario in one of two possible ways. In the “switch” version, the subjects are standing next to a switch that, if pulled, would divert the train onto a side-track, saving the five workman but killing one other worker laboring on this spur.³⁹¹ In the “footbridge” vignette, subjects are standing on a footbridge next to a workman wearing a heavy backpack. If they push the workman onto the track below, he will be killed but his body will stop the train and save his coworkers.³⁹² Greene recorded their choices in each scenario and mapped the corresponding brain activity leading to their decisions.

The Trolley study showed how man’s dual-process morality selects between its ethical extremes. Subjects presented with the “switch” scenario typically decided to pull the lever, effectively sacrificing one worker to save five. The dilemma here produced little activity in the emotional regions of the brain. Because the choice to flip the switch would not directly harm the victim—in fact, the subjects would not have to touch him at all—the killing was viewed as an impersonal and unfortunate side-effect of a morally righteous act.³⁹³ Indeed, subjects rationally justified the decision on the utilitarian ground that they helped more people than they hurt.³⁹⁴ In the “footbridge” version, the results were reversed. Subjects generally refused to push the lone worker onto the tracks, even though their inaction surely would

³⁸⁷ See Henriques, *supra* note 28, at 167.

³⁸⁸ See *id.* at 167-68, 172-73.

³⁸⁹ *Id.* at 173.

³⁹⁰ See Haidt, *supra* note 233, at 79-81.

³⁹¹ See Greene, *supra* note 231, at 115-16.

³⁹² See *id.* at 113-14.

³⁹³ See *id.* at 121.

³⁹⁴ See *id.* at 126-27.

result in the deaths of the others.³⁹⁵ Unlike flipping the switch, the prospect of shoving and killing the innocent bystander elicited a strong emotional response.³⁹⁶ These emotions made the death very personal.³⁹⁷ Such a directly harmful act seemed deontically wrong regardless of its justifiable consequences. In fact, the feeling of reprehensibility was so strong that no rational argument could displace it.

The “personalness” of man’s associations, or lack thereof, holds special relevance today. In early hunter and gatherer times, virtually all encounters involved direct conflict or cooperation among close and distant relatives or known acquaintances. As social networks have expanded, human interaction has become more attenuated and remote. Increasingly, people relate to each other in groups, with many structured as large organizations. Our wrongs are detached and impersonal, but so are the institutions that police and punish the wrongdoers. Thus, we seem to face an even bigger conundrum than our perplexing psychic dissonance. The more advanced our culture becomes, the more we rely on human proxies, like law, to promote our fundamental interests. When this occurs, our culture seems to lose the very humanity it exists to serve. Yet a full disconnect is never truly possible. As we shall see next, culture cannot break free of mankind, because mankind and culture are but flips sides of the same complementary coin.

B. SOCIOLOGY AND ANTHROPOLOGY

At first glance, the exploration of the relationship between human beings and their culture might appear to be rather innocuous, moving us up just a few branches in the middle of the Knowledge Tree from psychology to sociology and anthropology. In reality, however, this transition could not be more momentous. In fact, consilience advocate Edward Wilson calls it “the central problem of the social sciences and humanities, and simultaneously one of the great remaining problems of the natural sciences.”³⁹⁸ More significantly for our purposes, this nature-versus-nurture dilemma is the crux of jurisilience, which seeks to explain the cultural institution of law by examining human nature.

Traditional jurisprudence says no descriptive theory can traverse this seemingly impassable explanatory divide. While evolutionary biology, neuroscience, and (increasingly) psychology seek scientific truths about physical processes, sociology and anthropology artfully interpret man’s cryptic cultural meanings.³⁹⁹ The two cultures never converge because they develop in different ways. Natural kinds evolve; human kinds like law are created and interpreted by people according to changing historical circumstances. Even if humans develop by nature *and* nurture, human legality depends on *either* evolution *or* history; it could not be both.

³⁹⁵ See *id.* at 125-26.

³⁹⁶ See *id.* at 123-24.

³⁹⁷ See *id.* at 123.

³⁹⁸ WILSON, *supra* note 27, at 137.

³⁹⁹ See Tooby & Cosmides, *supra* note 86, at 21-23.

But as we shall see, this stark choice is really a false dichotomy. Culture is a complementarity consisting of evolution *and* history. Linked by coordination dynamics, these two forces form a recursive circuit of ontogeny, phylogeny, epigenesis, and cultural ontogeny. Though evolution and history compete to control human culture, neither side ever prevails. Instead, they constantly transform each other so culture can maintain its continuity even as it changes with the times.

1. Second Nature

If history teaches us anything, it is that human beings develop cultural practices to meet the evolutionary challenges presented by their surroundings. To see this most clearly, one must go back to the beginning—to a prehistoric era near the dawn of mankind. People in this precarious setting could not survive unless they both exploited and adapted to their environment. Because the environment included other human competitors, primitive man had to figure out how to coexist with others. According to anthropologist Alan Page Fiske, such adaptations necessarily occurred in three stages. Remarkably, these anthropological developments roughly track the evolutionary progression depicted earlier.⁴⁰⁰ In the first “cumulation” stage, human beings had to accumulate survival skills by learning from the experience of others.⁴⁰¹ This learning phase was followed by a “complementation” stage, in which people began complementing the beneficence of others by cooperating and reciprocating in kind.⁴⁰² Eventually, the collaborators began generating cooperation principles for new situations—an aptitude Fiske calls “generativity.”⁴⁰³

Because these adaptations promoted survival, people who mastered them were more likely to live and reproduce. Before long, all people would bear these traits. In fact, if Kohlberg is correct, such proficiencies would appear sequentially throughout the lives of each individual, propagating the selfish, social, and righteous stages of her moral maturation. Such life changes certainly prepared people for participation in the social world, but they also made the social world an integral part of their very essence. As Edward Wilson notes, the human mind grows from birth to death by “absorbing” the customs and practices of the existing social system.⁴⁰⁴ After generations of absorption, the lessons of social living no longer need to be brought to mind; sociability just becomes second nature.

This coordinative process altered the course of humanity. As social interaction expanded, each person influenced the beliefs, values, and behaviors of her cohorts. Such exchanges eventually created customs and norms that governed specific subgroups within society. Once these practices reached critical mass, society itself acquired a defining culture. In Wilson’s sage words, culture arises “from the productions of many minds that interlace

⁴⁰⁰ See *supra* Section III.A.

⁴⁰¹ See Fiske, *supra* note 115, at 87.

⁴⁰² See *id.* at 87-88.

⁴⁰³ See *id.* at 88-90.

⁴⁰⁴ WILSON, *supra* note 27, at 138.

and reinforce one another over many generations, [and] expands like a growing organism into a universe of seemingly infinite possibility.”⁴⁰⁵ But culture did not just shape the social system. After spreading outward for so long, culture slowly seeped down into the primordial reservoirs of our minds, where it soon informed our psychology. Indeed, our cultural heritage was passed on through so many generations that it eventually infiltrated our DNA. Because of this phylogenic shift, all human beings were embedded with information important for survival, preparing them for social living even before their arrival.⁴⁰⁶

Today, every person enters the world prewired for cultural integration. Invoking a useful analogy, Jonathan Haidt compares our infant brains to an unfinished book whose first draft “is written by the genes during fetal development.”⁴⁰⁷ According to Haidt, “No chapters are complete at birth, and some are just rough outlines waiting to be filled in during childhood[:] [b]ut not a single chapter—be it on sexuality, language, food preferences, or morality—consists of blank pages on which a society can inscribe any conceivable set of words.”⁴⁰⁸ In short, while culture may provide the historical detail that varies every life story, it also informs the evolutionary archetypes that unite all human narratives.

2. Metaculture

These inherited behavioral parameters—or epigenetic rules—serve a higher cultural purpose. In isolation, epigenetic rules predispose people toward certain rapid and effective solutions to common environmental problems.⁴⁰⁹ Such rules of thumb include many of the social instincts mentioned earlier, like the ability to understand, empathize with, learn from, and cooperate with others.⁴¹⁰ But they actually are far more extensive.⁴¹¹ Besides controlling many physical experiences—like seeing color from wavelengths of light⁴¹² and observing three-dimensional objects from two-dimensional retinal input⁴¹³—epigenetic rules instill us with a vast array of ethical inclinations, including Haidt’s essential moral appetites.

These inclinations prime our perceptions and beliefs but do not compel our actions. The way we implement epigenetic rules depends on existing cultural paradigms. For example, although all cultures value fairness, people must know what that concept means in the various contexts in which it is likely to arise. In exchange transactions, Fiske notes that

the participants must have a shared understanding of what kinds of entities can be exchanged in this manner, what constitutes an offer and acceptance of something proffered, what constitutes a return of the ‘same’ thing or value,

⁴⁰⁵ *Id.* at 243.

⁴⁰⁶ See Tooby & Cosmides, *supra* note 86, at 69.

⁴⁰⁷ Haidt, *supra* note 233, at 130.

⁴⁰⁸ *Id.* at 130-31.

⁴⁰⁹ See Wilson, *supra* note 27, at 210.

⁴¹⁰ See Tooby & Cosmides, *supra* note 86, at 90-92.

⁴¹¹ See Haidt, *supra* note 233, at 74.

⁴¹² See Wilson, *supra* note 27, at 160.

⁴¹³ See Tooby & Cosmides, *supra* note 86, at 90.

what is the proper interval between receiving and giving in return, permissible limits to imbalance, and so forth.⁴¹⁴

When our epigenetic rules are channeled through such contextual paradigms, we are able to develop specific cultural practices that help us coordinate our competing wants and needs.

These coordination practices are surprisingly uniform across the globe. As far back as 1945, anthropologist George Murdock listed sixty-seven universals of culture, including common legal subjects such as cooperative and specialized labor, ethics, incest taboos, government, inheritance rules, penal sanctions, population policy, property rights, status hierarchies, and trade.⁴¹⁵ More recently, anthropologist Donald Brown has pushed this number into the hundreds, dividing man's cultural commonalities into categories of basic human attributes, language, social and behavioral qualities, characteristics of mind, and an eclectic mix of other likenesses.⁴¹⁶ Labeling these universals "cultural coordinating devices" (CCDs), Fiske emphasizes many law-like conventions, including relational modeling and attributions of blame and causal responsibility for social transgressions.⁴¹⁷ In fact, Brown has posited that law itself is a universal coordinating device that establishes people's rights and obligations,⁴¹⁸ and Owen Jones and Timothy Goldsmith have shown that legal systems around the world generally use the same regulatory tools to address the same basic topics with much of the same substantive content.⁴¹⁹

These cultural affinities are so pervasive that they appear to form what Tooby and Cosmides call a human metaculture.⁴²⁰ This epiphenomenon is not just the collection of many minds; it is the formation of a single, consilient mind.⁴²¹ That metacultural mind is a higher-level complex system composed of individual human brains coordinating together to create patterns of cooperative stability and competitive instability. According to Eagleman, "each of our brains operates in [such] a rich web of interaction with one another . . . that we can plausibly look at the accomplishments of our species as the deeds of a single, shifting megaorganism."⁴²² In this sense, we are not unlike ants in a synchronized colony. Because our culture's coordination patterns derive from the genetic and psychological architecture

⁴¹⁴ Fiske, *supra* note 115, at 80.

⁴¹⁵ See George P. Murdock, *The Common Denominator of Cultures*, in *THE SCIENCE OF MAN IN THE WORLD CRISIS* 124 (Ralph Linton ed., 1945); see also WILSON, *supra* note 27, at 160 (discussing Murdock's list).

⁴¹⁶ See Donald Brown, *Human Universals, Human Nature & Human Culture*, 133 *DAEDALUS* 47, 47 (2004); see also Steven Pinker, *The Moral Instinct*, N.Y. TIMES (Jan. 13, 2008), <http://www.nytimes.com/2008/01/13/magazine/13Psychology-t.html> [https://perma.cc/PR88-JH33] (discussing Brown's list); Tooby & Cosmides, *supra* note 86, at 89 (same).

⁴¹⁷ See Fiske, *supra* note 115, at 81.

⁴¹⁸ See STEVEN PINKER, *THE BLANK SLATE* app. at 437 (2002) (compiling universals developed by Brown from 1989 to 1991, including two forms of law: rights and obligations, and rules of membership).

⁴¹⁹ See Jones & Goldsmith, *supra* note 222, at 466-75.

⁴²⁰ See Tooby & Cosmides, *supra* note 86, at 91.

⁴²¹ See Fiske, *supra* note 115, at 91-92 (noting that "[t]he human psyche has evolved to function as a cultural psyche").

⁴²² EAGLEMAN, *supra* note 241, at 147.

in every brain, we cannot fully grasp human culture, including the cultural artifact of law, by philosophical speculation *or* by social-scientific interpretation *alone*. Rather, we must come to know the human nature inside us all.

With the emergence of metaculture, we finally have closed the loop of complexity. Ontogenetically, our minds prepared our bodies for the exigencies of the environment, which contains other competitive human beings. Lessons from our interpersonal encounters further socialized our minds, and over time, became phylogenically ingrained in our bodies. These epigenetic rules then predisposed our minds to reengage the environment and its inhabitants in more adaptive ways. Soon, enough people shared the same rules that socializing conventions became cultural beliefs. As different beliefs arose, however, the cultural paradigm eventually destabilized, and the system of life began a new cycle.

This feedback loop never stops. In fact, it keeps human culture in a constant state of change. While our epigenetic impulses push one way, culture often pulls back in a different direction, innovating quick solutions to new or rapidly developing problems that evolution is simply too slow to address.⁴²³ Sociologist Scott Sanderson describes this push-and-pull dynamic as “the dialectical interplay” between human agency and social structure, with man’s existing social practices and biopsychological nature “reflect[ing] back” on and constraining his voluntary initiatives.⁴²⁴ Though these forces do not overpower each other, neither do they achieve true cultural synthesis. Instead, they oscillate to-and-fro, subtly attuning society to the perpetual rhythms of coordination dynamics. As Fiske aptly summarizes, “cultural reproduction and diffusion, natural selection, cognition, development, and social relations are dynamic processes acting on each other in a continuously shifting balance that never reaches equilibrium.”⁴²⁵

3. Cultural Evolution

Such cultural evolution may be irrepressible, but it is not incoherent. Since, in Fiske’s words, “[t]he human psyche has evolved to function as a cultural psyche,”⁴²⁶ it should come as no surprise that cultures develop very much like their human constituents. As noted previously, human brains evolved in three accretive stages, with the selfish hindbrain solving essential survival problems, the midbrain adding solutions to important social problems, and the forebrain using logic and reason to reconcile the other modules. Though the transitions for human morality are a little blurrier, our moral sensibilities seem to change over time, even if they dwell in us from the start. So despite man’s innate capacity to distinguish between moral and conventional wrongs, variations in impulse control can change a person’s

⁴²³ See WILSON, *supra* note 27, at 139.

⁴²⁴ Stephen K. Sanderson, *Evolutionary Materialism: A Theoretical Strategy for the Study of Social Evolution*, 37 SOC. PERSP. 47, 55 (1994).

⁴²⁵ Fiske, *supra* note 115, at 83.

⁴²⁶ *Id.* at 91-92.

behavior over the course of her life. In fact, new research suggests that impulsiveness recedes as the brain matures, initiating a developmental arc ranging from selfishness to sociability to self-sacrifice.⁴²⁷

Recently, anthropologist C.R. Hallpike documented a similar progression in human cultures.⁴²⁸ According to Hallpike, cultures tend to develop in “Kohlberg’s three levels of Concrete Individual Perspective, Social Order Perspective, and Principled or Post-Conventional [P]erspective.”⁴²⁹ Of course, this movement does not apply to all members of a culture,⁴³⁰ and does not suggest that certain cultures are morally inferior to others because they are incapable of ethical advancement.⁴³¹ Instead, it is based on the cognitive truth that more complex problems require more sophisticated problem-solving strategies.⁴³² So while atomistic societies like hunter-gatherers obsess about survival and subsistence, pan-tribal sodalities and other “corporate” associations also must address social issues related to political hierarchies, commercial trading, property ownership, and dispute resolution—to name just a few.⁴³³ When societies finally turn into states, their problems reach new and unparalleled heights, requiring all of the plucky resourcefulness and high-minded rationality a fully evolved brain has to offer.⁴³⁴ Even then, the culture’s previous proficiencies do not slowly fade away.⁴³⁵ Rather, they are continually integrated into its growing anatomy to strengthen it for the challenges yet to come.

A similar pattern specifically appears in the moral evolution of Western culture. According to sociologists Bradley Campbell and Jason Manning, Western societies have historically transitioned from cultures of honor to cultures of dignity.⁴³⁶ Early honor cultures displayed the selfish and social characteristics of Hallpike’s and Kohlberg’s first two levels of development. Grounded in values of physical bravery and freedom from domination, the honor code in these cultures depended on one’s social status.⁴³⁷ Critical to that status was a person’s reputation in the community.⁴³⁸ Because an insult could tarnish that reputation, the offended party was expected to take matters into her own hands, often by exacting violent retribution against her offender.⁴³⁹ Indeed, the failure to fight back could cause even greater reputational damage than the insult itself.⁴⁴⁰ As populations expanded,

⁴²⁷ See generally Nikolaus Steinbeis et al., *Impulse Control and Underlying Functions of the Left DLPFC Mediate Age-Related and Age-Independent Individual Differences in Strategic Social Behavior*, 73 NEURON 1040 (2012) (finding that the decline of selfishness with age is attributable to the maturation of a brain region involved in self control).

⁴²⁸ C.R. HALLPIKE, *THE EVOLUTION OF MORAL UNDERSTANDING* 10, 152-53 (2004).

⁴²⁹ *Id.* at 183, 185.

⁴³⁰ *Id.* at 143, 185.

⁴³¹ *Id.* at 14.

⁴³² *Id.* at 183-85.

⁴³³ See generally *id.* at 187-270 (discussing the nature of “atomistic” and “corporate” societies).

⁴³⁴ See generally *id.* at 271-369 (discussing the nature of early states).

⁴³⁵ See *id.* at 183.

⁴³⁶ Bradley Campbell & Jason Manning, *Microaggression and Moral Cultures*, 13 COMP. SOC. 692, 695 (2014).

⁴³⁷ See *id.* at 711-12.

⁴³⁸ See *id.*

⁴³⁹ See *id.*

⁴⁴⁰ See *id.* at 712.

society grew safer, and law secured individual liberties, people became less concerned about public opinion and more self-assured about their own intrinsic worth.⁴⁴¹ The result was a culture of dignity founded on fundamental human rights. Preferring rational self-restraint to honorable aggression, the dignity culture resolved personal affronts through consensual agreement and public due process.⁴⁴² Honor sects surely persisted, but the Western mind became thoroughly transfixed by “postconventional” ideals of justice and fairness.

This description of cultural evolution not only complements the other domains of human knowledge, it completes a relatively coherent portrait of humanity. Though people are exquisitely different, they are all basically the same. From our chromosomes to our culture, we human beings are complementary creatures governed by the laws of coordination dynamics. The enduring struggle to reconcile life’s conflicting forces defines the human condition. At any given moment, we must negotiate between emotion and reason, instinct and idea, individual and group, authority and autonomy, competition and cooperation, purity and venality, and good and evil. Because people are complex systems, we address these problems systematically. Internal homeostasis protects our biological systems from fatal extremes, yet it cannot guarantee our survival. Our bodies need help from the outside world, which offers food, shelter, mates, and other invaluable resources. By cooperating with other humans, we form social systems that enhance our sustainability. But socializing naturally brings conflict, so we must develop coordinative strategies for preserving group metastability. The more successful these tactics prove to be, the more widespread they become, until they finally pervade our culture.

When society becomes too large to handle such matters informally, it must fashion formal cultural systems or institutions to coordinate the systems below. Some of these institutions—like trade conventions—clearly derive from natural instincts like reciprocal altruism. But what about our institution of law? Does it elude the reach of epigenetics, as modern jurisprudence has long assumed, or is it governed by the same coordinative patterns as the systems that surround it? In posing this question, we have brought our discussion nearly full circle. Rather than ignoring nature, we now have reason to ask whether law *is nature*, or at least, whether it is the predictable byproduct of complex natural processes. By consulting science throughout this piece, we can see how nature might cause law. However, another critical step still remains. To move from juriscience to jurisilience, we must search the law’s anatomy for signs of natural influence.

V. JURISCIENCE TO JURISILIENCE

Jurisilience is not just a theory about the nature of law. It is an interdisciplinary explanation about how law reflects human nature, displaying the same defining features as its competing and coordinating

⁴⁴¹ See *id.* at 712-13.

⁴⁴² See *id.*

creators. What's more, jurisilience does not just describe a few of the law's idiosyncrasies. Because of its capaciousness, it has the potential to grasp virtually all of law's core characteristics. Of course, given space limitations, the present account cannot dig deeply into any specific concept or practice. Instead, it establishes its profundity by the extraordinary breadth of its reach. Thus, the exposition will remain at a high level of generality, interweaving the threads of complementarity and coordination dynamics throughout much of the law's history, content, and interpretive theories. Though diversity is no substitute for detail, jurisilience's multidimensional approach promises to capture a more accurate and informed image of law than the stark, two-sided caricature of general jurisprudence.

A. HISTORY

Perhaps the best place to begin this survey is at the law's beginning, tracing the various phases or patterns of its historical development—or, at least, so it would seem. While history enjoys preeminence in the humanities, it actually has held an uncertain role in jurisprudence. Analytic theorists often contend that history is irrelevant to general jurisprudence because law possesses a universal essence that transcends all boundaries of time and place.⁴⁴³ Under this view, the law's nature is accessible only through rational analysis and cannot be discovered by studying actual humans or human societies.⁴⁴⁴ However, social theory scholars such as Brian Tamanaha argue law is *essentially historical*,⁴⁴⁵ amounting to “whatever people identify and treat through their social practices as law.”⁴⁴⁶ These theorists say that law can be understood *only* by examining the rich diversity and multiplicity of legal systems around the world,⁴⁴⁷ yet deny that such institutions share any enduring nature.⁴⁴⁸ Unfortunately, neither narrative gets history quite right. While history influences legal systems, including our Anglo-American system of common law, it also is shaped by the evolving humanity of the systems' legal subjects.

⁴⁴³ See Dan Priel, *Jurisprudence Between Science and the Humanities*, 4 WASH. U. JURIS. REV. 269, 272 (2012) (“Contemporary analytic jurisprudence is strongly a-historical—both in the sense that it cares little for the role of history and tradition within law, and in the little interest many of its proponents display for the history of jurisprudence itself.”); Brian Z. Tamanaha, *Necessary and Universal Truths About Law?*, 30 RATIO JURIS. 3, 3 (2017) (describing the analytic belief that “[a] true theory of law holds for all places and all times”).

⁴⁴⁴ See SHAPIRO, *supra* note 16, at 406-07 n.16.

⁴⁴⁵ See Tamanaha, *supra* note 443, at 22 (arguing that “forms of law arise and change over time in connection with social, cultural, economic, political, ecological, and technological factors”).

⁴⁴⁶ BRIAN Z. TAMANAHA, A GENERAL JURISPRUDENCE OF LAW AND SOCIETY 166 (2001).

⁴⁴⁷ See TWINING, *supra* note 17, at xi (arguing that “most processes of so-called ‘globalisation’ take place at sub-global levels and that a healthy cosmopolitan discipline of law should encompass all levels of social relations and of normative and legal ordering of these relations,” especially within non-Western legal traditions and cultures).

⁴⁴⁸ See Tamanaha, *supra* note 443, at 4 (“The basic problem with establishing necessary, universal truths about law is that concepts of law and legal institutions vary and are socially and historically contingent and change over time.”).

1. Legal Systems

Law is a factual thing that values certain human behaviors. Though fact and value seem like contradictory concepts, they actually are complementary aspects of our complex human condition. Like other factual essences, law extends through time and space. It arises from physical data processors called brains, is embodied in physical symbols like language, is performed in physical practices like legislative and judicial proceedings, and is reported in physical documents like court opinions, statutes, and regulations. As human and social conditions change, law adapts and evolves in kind. Thus, law is undeniably historical. But law's historicity is not completely contextual. Our law instinct is deeply entrenched in epigenetic rules like reciprocity, justice, fairness, loyalty, authority, liberty, and sanctity. While culture molds these rules, genetics preserves their universality and spreads them from one generation to the next. Such revisable survival codes standardize and stabilize the law even as it changes and diversifies. Thus, law's history is never purely factual. Instead, it is shaped by the normative, life-perpetuating preferences of human nature.

As we learned earlier, the path of human development can be seen in the history of man's social systems. Anthropologists like Hallpike have identified a clear pattern in man's evolving social arrangements. Generally speaking, human beings have moved from small hunter-gatherer bands, to larger chiefdoms, to centralized states.⁴⁴⁹ According to Hallpike, these organizational shifts both address and create new social problems that require increasingly more sophisticated solutions. These approaches roughly track the stages of human moral development. Thus, hunter-gatherers rule by punishments and sanctions, while chiefdoms govern by social convention, and states implement a set of rights and responsibilities.⁴⁵⁰ As society progresses, the earlier solutions are not replaced by the newer strategies but rather are absorbed into the system as a whole, creating a dynamic synergism among the various parts.

The same process is evident in the history of legal systems. As Professor Tamanaha acknowledges, the "rudimentary" law of hunter-gatherers "established protections and restrictions relating to property and persons—the basics necessary for physically vulnerable comfort-and-pleasure seeking social-sexual beings with aggressive-and-affectionate tendencies to live together, procure adequate food and shelter, survive and reproduce."⁴⁵¹ These pre-conventional legal entities were followed by conventionally minded-chiefdoms, which used a council of elders or community consensus "to restore ruptured relations within the social group."⁴⁵² As societies formed states, legal power shifted from the collective to a central organization that maintained its control by conferring back to its citizens certain protective rights.

⁴⁴⁹ See generally HALLPIKE, *supra* note 428 (describing the moral evolution that occurs during these cultural transition phases).

⁴⁵⁰ *Id.* at 183, 185.

⁴⁵¹ See Tamanaha, *supra* note 33, at 46.

⁴⁵² *Id.* at 13.

These rational political concessions are largely uniform across cultures. We already have catalogued many such similarities in the work of “essentialist” anthropologist Donald Brown and the jurisprudence team of Owen Jones and Timothy Goldsmith, who separately compiled robust lists of cultural-legal universals.⁴⁵³ Law everywhere tends to coordinate social relationships from above by defining social roles, managing resources, protecting property interests, regulating labor and reciprocal exchange, and punishing cheating and harmful aggression.⁴⁵⁴ In function and effect, the state’s emergent legality promotes a social metastability. Like a brain coordinating the conflicting impulses of the body, the political head-of-state continually systematizes and harmonizes the competing activities of its body politic.

2. *Common Law*

Striking parallels appear in the evolution of the common law. As historian Harold Berman reports, “[e]ver since the early formation of discrete modern Western legal systems in the twelfth century, it had been taken for granted that a legal system has an ongoing character, a capacity for growth over generations and centuries.”⁴⁵⁵ By the sixteenth and seventeenth centuries, this view dominated English jurisprudence, pervading the writings of Sir Edward Coke, John Selden, and Sir Matthew Hale.⁴⁵⁶ According to these celebrated English jurists, law is a continuous organic process of evolution in which lawmakers regularly adapt past solutions to critical social problems to suit present circumstances.⁴⁵⁷

Indeed, Hale seemed to grasp both the complementarity and coordination dynamics stimulating this progression. Noting that the law has both a political orderliness dimension and a principled moral dimension, Hale argued that these seemingly incompatible aspects were constantly mediated and integrated by a historical sense of continuity and community.⁴⁵⁸ So even as the law evolved, history established the boundary conditions for its political and moral extremes, ensuring that the English legal system remained relatively stable despite its perpetual instability.⁴⁵⁹

A look back into history reveals exactly this dynamic. A truly distinctive English legal system did not begin until after the Norman invasion in 1066. Because the Normans were largely outnumbered by Britain’s other inhabitants, the new royal justice system was devoted primarily to keeping order. Thus, early laws implemented a strict regime of punishments for failing to catch criminals, committing felonies, or generally breaching the king’s peace.⁴⁶⁰ Justice in English courts was quick, harsh, and primitive,

⁴⁵³ See *supra* text accompanying notes 416-19.

⁴⁵⁴ See Jones & Goldsmith, *supra* note 222, at 465-75.

⁴⁵⁵ Harold J. Berman, *The Origins of Historical Jurisprudence: Coke, Selden, Hale*, 103 YALE L.J. 1651, 1654 (1994).

⁴⁵⁶ See *id.* at 1655.

⁴⁵⁷ See *id.* at 1695, 1697, 1698, 1702, 1712-13.

⁴⁵⁸ See *id.* at 1711.

⁴⁵⁹ See *id.* at 1712-13.

⁴⁶⁰ See ALAN CALNAN, THE RIGHT TO CIVIL DEFENSE IN TORTS 20-21, 23-24, 26-28 (2013).

often resulting in a trial by battle or a ritualized ordeal.⁴⁶¹ Indeed, like the reptilian brain or the self-interested toddler, this burgeoning legal apparatus was preoccupied with securing its own survival.

Ironically, jurists during the same period started to rediscover the classics. In this little-known Twelfth-Century Renaissance, judges schooled in European universities learned Aristotelian ethics, Roman law, and canonical jurisprudence from contemporary masters like Peter Abelard and Thomas Aquinas.⁴⁶² They practiced the scholastic method of argumentative disputation to realize the power of logic and reason.⁴⁶³ Through this process, jurists like John of Salisbury and later, William of Ockham, Sir John Fortescue, and Christopher St. German, gradually embraced the notions of natural law, individual rights, and humanist morality.⁴⁶⁴ Thus, by the time of the great Renaissance, the brutish English legal system had begun to develop a conscience.

Jurists confronted by the law's baser and higher natures needed to find an adequate means of reconciliation. With civil conflict declining and city living ascending, royal governments increasingly used customary law to create social fusion. According to Selden, all law originated in customary norms and patterns of behavior tacitly or expressly approved by the community.⁴⁶⁵ This gave the emerging common law two sources of authority. Because lawyers and judges shaped judicial opinions, the common law embodied the norms and problem-solving patterns of legal experts over the span of many generations.⁴⁶⁶ In more recent times, however, the law came to reflect the customs of average people, who frequently convened as juries to decide cases on the basis of past precedents and current community values.⁴⁶⁷

Both historical approaches had the moderating effect of blending the community's morality with the law's prescriptions through the medium of practical wisdom. As Berman explains, law in this context was "the balancing of morality and politics in the light of history" or "the balancing of justice and order in the light of experience."⁴⁶⁸ Either way, the result was altogether human, reflecting man's enduring struggle to reconcile the selfish, social, and moral sides of his nature. Groping through adolescence, the English justice system had wrestled with its inner conflict and achieved an ongoing semblance of dynamic coordination.

Standing alone, such an interpretation may seem intriguing but oversimplified. Indeed, taken in isolation, none of these developmental patterns proves the law's coordinative evolution. Yet when considered together, these thematic similarities are harder to dismiss. Indeed, their uncanny confluence begins to form a coherent narrative. The history of law

⁴⁶¹ See *id.* at 23-24.

⁴⁶² See ALAN CALNAN, A REVISIONIST HISTORY OF TORT LAW: FROM HOLMESIAN REALISM TO NEOCLASSICAL RATIONALISM 120-22 (2005).

⁴⁶³ See *id.* at 122-23.

⁴⁶⁴ See *id.* at 125-28, 134; Berman, *supra* note 455, at 1658.

⁴⁶⁵ Berman, *supra* note 455, at 1699-1700.

⁴⁶⁶ See *id.* at 1689-93, 1699-1700.

⁴⁶⁷ See CALNAN, *supra* note 462, at 174-77.

⁴⁶⁸ Berman, *supra* note 455, at 1731.

looks a lot like the history of mankind. As problem-solving mechanisms of problem-solving organisms, legal systems operate over time very much like the minds that created them—constantly reconciling their competing tendencies to reach moments of clarity and stability but continually adapting their solutions to meet the demands of changing circumstances.

B. CONTENT

The historical strands of jurisilience are only strengthened by its substantive insights. By stepping back and observing law from a distance, we can begin to see some familiar patterns. In form, fundamentals, and functions, law appears to coordinate conflicting forces through a process of metastability. Of course, such a proposition cannot be proven in just a few paragraphs. The law's content is far too vast and subtle to capture in the sort of introductory survey offered here. Nevertheless, we can at least begin to identify some of the major themes that warrant future development.

1. Structure

We observed above how a legal system's structure changes as its problems grow more complex—moving from personal to social to centralized forms of governance. A system that reaches the final stage does not shed its generative precursors. Instead, it accumulates and incorporates them into its expanding architecture. In liberal democracies, this conglomeration typically results in a tripartite system of government. The executive branch executes and enforces the law, securing its most basic needs; the legislative branch creates a communal process for resolving the system's most comprehensive and persistent social problems; and the judicial branch acts as the conscience of the collective, using abstract principles and general rights to mediate society's irreconcilable disputes.⁴⁶⁹

The dynamics within the law's superstructure extend to each of the levels below. For example, the judicial branch operates the criminal justice system, the civil justice system, and a system of constitutional review. These systems

⁴⁶⁹ As a coordinative system, each branch both catalyzes and constrains the others, stimulating growth in new directions and deflecting destructive impulses. America's experience with the Patriot Act offers an apt example. See USA PATRIOT Act of 2001, Pub. L. No. 107-56, 115 Stat. 272 (codified as amended in scattered U.S.C. titles 8, 12, 15, 18, 20, 31, 42, 47, 49, and 50) [hereinafter USA Patriot Act]. Following the terrorist attacks on 9-11, the executive branch, through the Justice Department, urged dramatic changes to our intelligence system to protect us from future aggression. See Beryl A. Howell, *Seven Weeks: The Making of the USA Patriot Act*, 72 GEO. WASH. L. REV. 1145, 1147-52 (2004). Congress passed such legislation just a few weeks later, greatly expanding the executive's powers of surveillance. See *id.* at 1164-78. After learning that the National Security Agency (NSA) had collected and stored phone data from wiretapped calls, civil rights activists brought lawsuits to stop the practice. See *NSA Surveillance*, ACLU, <https://www.aclu.org/issues/national-security/privacy-and-surveillance/nsa-surveillance> [<https://perma.cc/E7UK-W6DS>] (discussing such cases). The judiciary's privacy concerns caused Congress to amend the law to restrict the executive's access to such records without prior court approval. See Mike DeBonis, *Congress Turns Away From Post-9/11 Law, Retooling U.S. Surveillance Powers*, WASH. POST (June 2, 2015), http://www.washingtonpost.com/politics/senate-moves-ahead-with-retooling-of-us-surveillance-powers/2015/06/02/28f5e1ce-092d-11e5-a7ad-b430fc1d3f5c_story.html [<https://perma.cc/4TEG-9X9R>] (discussing the amendment). The process may have been long and imperfect, but in the end, our legal circuitry worked the way it was designed. Like our neural networks, this balance-of-powers approach created an emergent feedback loop that collaborated to troubleshoot existing conundrums and readjusted as circumstances changed.

function in the same coordinative fashion. While the criminal regime uses state authority to enforce the rule of law, the civil system preserves social solidarity by allowing ordinary citizens to resolve community conflicts. When disagreements arise in any area, constitutional law provides a principled solution that coheres with the law's core values.

But even as each system assumes its unique identity, it constantly co-evolves with the others. The criminal law shares with the civil law various concepts and practices, including theories of intent, negligence, and strict liability; the doctrine of factual causation; the compensatory sentence of restitution; and victim-offender mediation.⁴⁷⁰ Meanwhile, the civil system frequently borrows from its criminal counterpart various statutory proscriptions and the purely retributive sanction of punitive damages.⁴⁷¹ Constitutional law both coordinates and is coordinated by these lower systems. Though it secures fairness in the civil and criminal fields,⁴⁷² its notion of fairness is continually refined by realities in each.⁴⁷³

Even the structure of litigation bears the stamp of jurisilience. The judicial system is a public mechanism for punishing cheaters and airing grievances. As noted earlier, this system did not come about by chance. Reciprocal altruism works only if people know that bad deeds will be met with reproof. Small groups can punish culprits in person because everyone will see or eventually learn about both the infraction and the response. Because private retribution is less conspicuous in larger groups, such societies must find other means to reprimand wrongdoers and publicize their punishments. A formal court system serves this purpose. It creates an open public forum—like a modern town square—where everyone can see cheaters being brought to justice.

That forum bears all the hallmarks of complementarity and coordination dynamics. At bottom, a legal action is a battle of egocentric drives with the plaintiff aggressively attacking the defendant and the defendant instinctively recoiling in self-defense. Since the parties cannot find a practical solution to their conflict, the state steps in to mediate the dispute. In this respect, the state acts much like the rational rider attempting to control her contentious emotional elephants. It sets general behavioral parameters by creating legal doctrines, principles, and values to serve as the system's conscience. Yet the state does not impose these demands dogmatically. Instead, acting as the system's left-brain interpreter, the state filters its expectations through the pragmatic mechanism of the court system, which uses the social experience

⁴⁷⁰ See generally Kenneth W. Simons, *The Crime/Tort Distinction: Legal Doctrine and Normative Perspectives*, 17 WIDENER L.J. 719 (2008) (discussing the similarities and differences between crimes and torts).

⁴⁷¹ See Robert F. Blomquist, *The Trouble With Negligence Per Se*, 61 S.C. L. REV. 221, 222, 278-80 (2009) (discussing how the tort doctrine of negligence per se enforces criminal prohibitions); Jill Wieber Lens, *Punishing for the Injury: Tort Law's Influence in Defining the Constitutional Limits in Punitive Damage Awards*, 39 HOFSTRA L. REV. 595, 616-18 (2011) (discussing the similarity between punitive damages and criminal punishments).

⁴⁷² This specifically is accomplished through the doctrine of due process. See generally Niki Kuckes, *Civil Due Process, Criminal Due Process*, 25 YALE L. & POL'Y REV. 1 (2006) (discussing both forms of due process).

⁴⁷³ See Lens, *supra* note 471, at 622-35 (noting how tort law affects the constitutional interpretation of punitive damages).

of judges and juries to transform these normative maxims into highly contextual judgments of responsibility.⁴⁷⁴

But perhaps the most beguiling part of law's form is its persistent and pervasive formality. From democracies to chiefdoms and congresses to courtrooms, law is steeped in regalia and ritual. Take, for example, the supposedly progressive Anglo-American system. In medieval England, people were tried by physical ordeals and brutal combat.⁴⁷⁵ Such proceedings often were held on church property, involved elaborate ceremonies, and incorporated religious symbols.⁴⁷⁶ Though high-ranking mortals presided over these rituals, the outcomes were considered divinely ordained.⁴⁷⁷ In time, sticks and stones were replaced by powdered wigs and ornate robes. Today, legal forms certainly are more civil and secular, yet they are no less formalistic. Law exists in magnificent buildings, glorified authorities, solemn oaths, dignified symbols, impressive uniforms, meticulous rules, ritualized proceedings, and written records.

Initially, these trappings might be viewed as useless vestiges of a bygone era and evidence of law's overzealous attachment to history and tradition. Not so. In fact, formality is crucial to legality. It speaks to some of the oldest questions of jurisprudence. What gives law its authority? Why do people obey law? In short, what makes law, law, and not just a coercive command or social practice?

Enlightenment lies within. As noted previously, all human beings are born with an innate instinct to respect authority.⁴⁷⁸ Indeed, Haidt notes that "[t]he urge to respect hierarchical relationships is so deep that many languages encode it directly."⁴⁷⁹ But he also is quick to clarify that human authority is not just "raw power backed by the threat of force."⁴⁸⁰ It is a shared beneficial relationship with mutual responsibilities. While subordinates must give their obedience, authority figures are expected to provide protection by suppressing violence and resolving disputes within the group.⁴⁸¹ "When people within a hierarchical order act in ways that negate or subvert that order," Haidt observes, "we feel it instantly, even if we ourselves have not been directly harmed."⁴⁸² Because the whole community gains from such arrangements, "everyone has a stake in supporting the

⁴⁷⁴ This mediating effect is even stronger than first appears. The judge and jury are not the only intermediaries in the dispute. The attorneys of record also serve as rational buffers between the impulsive drives and self-conscious inhibitions of their clients. There is little doubt that lawyers help neutralize the emotion, anxiety, and natural aggression of their clients so they can better identify and achieve their long-term goals. See Roiphe, *supra* note 349, at 1212-14. But counsel also can reduce the moral qualms of litigation, making awkward accusations or harsh demands that clients might ordinarily resist. See *id.* at 1214-18. Thus, no matter which side the zealous advocate may take, she is actually and essentially a stabilizing influence in the dynamic instability of litigation.

⁴⁷⁵ See H.L. Ho, *The Legitimacy of Medieval Proof*, 19 J.L. & RELIGION 259, 260-61 (2004).

⁴⁷⁶ See *id.* at 265-67.

⁴⁷⁷ See *id.* at 261, 265.

⁴⁷⁸ See HAIDT, *supra* notes 233 at 133, 149, 152-79, and accompanying text.

⁴⁷⁹ *Id.* at 165.

⁴⁸⁰ *Id.* at 167.

⁴⁸¹ *Id.* at 166-68,

⁴⁸² *Id.* at 168.

existing order and in holding people accountable for fulfilling the obligations of their station.”⁴⁸³

Still, if authority were just a matter of simple expedience, a legal system would be little different from neighborhood watches or even the protection rackets of organized crime. Law’s formality sets it apart. Indeed, its extreme officiality strikes the deep moral chord of sanctity. As used here, sanctity is not a feeling of holiness, but of inviolability. According to Haidt, our sanctity drive “makes it easy for us to regard some things as ‘untouchable.’”⁴⁸⁴ Those things can consist of people and places, but they also can include principles and practices.⁴⁸⁵ So just as religions use pomp and circumstance to sacralize their creation stories and belief systems, legal systems use formality to sacralize their authority.

Research shows that legal ceremony actually has four sacralizing effects. It causes people to develop a trust in legal authorities, feel a sense of inclusion, believe they are treated more fairly, and assume they have a voice in the system.⁴⁸⁶ This is especially true of judicial rituals. As Professor Oscar Chase and Lecturer Jonathan Thong have shown, a judge’s regalia give her automatic credibility, making her appear more respectful and knowledgeable.⁴⁸⁷ Judicial attire also affects objectivity and fairness. “The judge’s robe and other ceremonial symbols of the courtroom are . . . ‘social signs’ that the judge has put aside her individuality and assumed the role of an authority acting ‘under law’—that is, deciding according to neutral principles.”⁴⁸⁸ This perception is enhanced by the formality of court proceedings. Because law’s subordinates are invited to participate in law’s elaborately staged events, they routinely experience feelings of inclusion, respect, and empowerment.⁴⁸⁹ Even location matters, as participants in judicial proceedings see courtrooms as more dignified than other fora, and accordingly, view both judges and the legal system in a significantly more favorable light.⁴⁹⁰ Finally, by elevating legal concepts like justice and fairness to the sacred status of God-given rights, law acquires a palpable air of religious mysticism.

Judicial ceremony does not just forge hierarchical relationships; it effectively systematizes them. At bottom, a trial is a restoration ritual. When lives conflict, social hierarchies often are disrupted. A person who intentionally or carelessly harms another not only exceeds her own social role, she diminishes the social role of the victim and challenges the overarching authority of law. As Professor Geoffrey Miller reveals, the rites of litigation restore hierarchical order, “realign[ing] the individual and social identities, and thereby reduc[ing] the threat to society that the continued

⁴⁸³ *Id.*

⁴⁸⁴ *Id.* at 173.

⁴⁸⁵ *Id.* at 174.

⁴⁸⁶ See Oscar G. Chase & Jonathan Thong, *Judging Judges: The Effect of Courtroom Ceremony on Participant Evaluation of Process Fairness-Related Factors*, 24 *YALE J.L. & HUMAN.* 221, 225-26 (2012).

⁴⁸⁷ *Id.* at 236-37.

⁴⁸⁸ *Id.* at 226.

⁴⁸⁹ *Id.*

⁴⁹⁰ *Id.* at 236.

existence of a disparity between these identities would create.”⁴⁹¹ In this way, law expresses its ability and willingness to uphold its end of the hierarchical bargain.

Ultimately, law’s ceremonial structure fulfills a coordinative function vital to its systemic success. Acting as stabilizing agencies, legal rituals like trials symbolically reconcile conflicting social norms.⁴⁹² Indeed, Professor Jessie Allen explains that, insofar as “[l]aw’s enacted ceremonies of ideological conflict” publicly resolve contradictory ideals, these rituals create the appearance of tolerance for, and coherence of, the competing positions.⁴⁹³ On a deeper level, legal ceremony helps to reconcile the emotional and rational modes of human decision making. Though the legal system invokes abstract principles to decide disputes, it uses the emotionally charged drama of the courtroom to turn ordinary cases into compelling morality plays. According to Allen, “The idea is that the condensation in ritual symbols of sensory affective content with social ideals tends to combine the two in the minds of ritual participants.”⁴⁹⁴ Yet each also influences the other. Powered by coordination dynamics, “[n]orms and values . . . become saturated with emotion, while the gross and basic emotions become ennobled through contact with social values.”⁴⁹⁵

2. Substance

Despite these formal affinities, jurisprudence does not depend on structure alone. It also puts flesh on law’s bones by explaining the nature and scope of its content. The starting point is easy enough. The substantive foundation for all legal systems is justice, however defined.⁴⁹⁶ Our foregoing jurisprudence story briefly traced this ideal back to man’s epigenetic urge for reciprocal altruism,⁴⁹⁷ and others have elaborated on its origins.⁴⁹⁸ Thus, I will not amplify this point here. But because our narrative ultimately ends in coordination dynamics, we must consider how justice serves a coordinative purpose.

The Western legal tradition embeds justice in substantive rights and duties. Rights protect and secure freedom, while duties impose freedom restrictions. Though antipodal, these concepts are interconnected and coextensive. Most primary rights are equipped with secondary rights that empower their holders to enforce the duties of others, who possess secondary vulnerabilities or liabilities to that power.⁴⁹⁹ Thus, if someone violates my right to bodily integrity, the law affords me a tort claim to take recourse

⁴⁹¹ Geoffrey P. Miller, *The Legal Function of Ritual*, 80 CHI.-KENT L. REV. 1181, 1220 (2005).

⁴⁹² See Jessie Allen, *A Theory of Adjudication: Law as Magic*, 41 SUFFOLK U.L. REV. 773, 803-04 (2008).

⁴⁹³ *Id.*

⁴⁹⁴ *Id.* at 810-11.

⁴⁹⁵ *Id.* at 811.

⁴⁹⁶ See generally Robinson et al., *supra* note 222 (discussing shared intuitions of justice across cultures).

⁴⁹⁷ See *supra* notes 252-255 and accompanying text.

⁴⁹⁸ See generally Jones & Goldsmith, *supra* note 222 (exploring the behavioral- biologic roots of law and justice); Robinson et al., *supra* note 222 (same).

⁴⁹⁹ See ALAN CALNAN, *JUSTICE AND TORT LAW* 23-25 (1997).

against the interloper. These right-duty configurations coordinate the parties' liberties in preplanned ways.

However, such complementarities are not always so neat and tidy. When an interpersonal clash occurs, a court often must reconcile the accuser's apparent right with the accused's apparent duty. Indeed, because the accused will also have rights to be free from unwarranted liberty restrictions, and the accuser will have duties not to assert spurious claims, the reconciliation process may be extremely complex.⁵⁰⁰ In these situations, the existence of general rights and duties helps to facilitate the decision making process. By giving these polar positions a prominent place in legal analysis, the decision maker is forced to simultaneously weigh and coordinate their competing tendencies.

Facilitating this coordinative search for justice is a scheme of legal canons patterned after human cognitive processes. When legal theorists reduce law into its essential components, they typically employ either of two frameworks. One divides law's elements into doctrine, policy, and theory; while the other separates them into rules, standards, and principles.⁵⁰¹ Yet these approaches are more alike than different. In fact, beyond the terminological nuances, both are strategically framed to facilitate coordination dynamics.

Like our brains, the law must continuously reconcile three competing impulses. These impulses find embodiment in the law's three substantive elements. Doctrines and rules generally ingrain law's most basic instincts and individual rights, giving them a level of rigidity and certitude befitting their homeostatic importance. These directives include some of the oldest and most familiar precepts in the law. As Fiske points out, all cultures tend to attribute misfortunes to human wrongdoing and assign blame predominantly on the basis of social transgressions—just like our criminal and civil justice systems.⁵⁰² As noted earlier, such instincts seem to coalesce into several predictable categories. Because people everywhere must worry about acquiring and owning resources, exchanging goods, punishing and redressing wrongs, and mating and reproducing offspring, cultures naturally develop laws of property, contracts, crimes, torts, and domestic relations.⁵⁰³

Yet such doctrines are not permanently set in flesh. As epigenetic rules, they constantly are subject to reconsideration and revision in light of fluctuating societal and cultural conditions. In law, this reflective process begins with policies and standards. Embodying contextual norms, such social considerations serve to reform, limit, or even displace our legal instincts when cooperative imperatives so require. This may happen

⁵⁰⁰ See CALNAN, *supra* note 460, at 4-9.

⁵⁰¹ See generally Barbara Bennett Woodhouse, *Mad Midwifery: Bringing Theory, Doctrine, and Practice to Life*, 91 MICH. L. REV. 1977 (1993) (discussing the importance of teaching doctrine, theory, and practice—including public policy—in legal education); Larry Alexander, *The Objectivity of Morality, Rules, and Law: A Conceptual Map*, 65 ALA. L. REV. 501 (2013) (comparing legal rules, legal standards, and legal principles).

⁵⁰² See Fiske, *supra* note 115, at 81.

⁵⁰³ See Jones & Goldsmith, *supra* note 222, at 467-68, 474-75.

episodically, as when changing social needs prompt shifts in public policy⁵⁰⁴ or prevailing community norms spark occasional exceptions to general behavioral proscriptions.⁵⁰⁵ If social dynamics are sufficiently compelling, the law may switch quickly and categorically from such bright-line rules to open-ended standards of reasonableness.⁵⁰⁶

Ultimately, even this layer of regulation is accountable to the law's theories and principles, which help to integrate its discordant inclinations into a cohesive system of situational problem solving. No matter how socially useful or effective a law may be, it can be altered or abolished if it is unequal, unfair, unreasonable, or unjust. These "higher" ideals certainly moderate the law's baser instincts, but never completely usurp control. Instead, our three legal cognitions constantly battle for supremacy, forming a complex system that rigidly maintains its normative structure yet never stays the same.

3. *Process*

In fact, deeper probing reveals greater consilience at the level of process. Reflecting its human nature, the law is shaped by decision making processes that seem ingeniously—if unwittingly—designed to ensure its fluid metastability. As noted previously, metastability arises when the mind *simultaneously* entertains two or more apparently contradictory ideas.⁵⁰⁷ While maintaining independent functions, the brain's neurons form specialized neural groups which spontaneously couple and dissolve, creating an infinite variety of coalitions and networks before a decision is finally reached.⁵⁰⁸ Because these fleeting antagonistic impulses compete for attention, the mind resists making snap judgments at either extreme. Instead, it must mull the terms of their reconciliation, exploring all the possibilities of the prodigious middle ground. The resulting mindset is not simply reasonable; it is super-rational. As Niels Bohr observed, "If you hold opposites together in your mind you will suspend your normal thinking and allow intelligence beyond rational thought to create a new form."⁵⁰⁹ Law may be one such form.

Our legal practices consistently seem to force our lawmakers to "hold opposites together" as they address legal problems. Although law in hunter-gatherer groups relied heavily on personality, most organized cultures make law a social convention. Human beings everywhere tend to diversify their legal decision making, creating rules and sanctions through tribal councils, community customs, jury panels, court systems, common law precedents, parliaments, congresses, and more.

These pluralistic approaches optimize our capacity for complex problem solving. In each format, the minds of many people form a single deliberative

⁵⁰⁴ See ALAN CALNAN, *DUTY AND INTEGRITY IN TORT LAW* 78-82 (2009) (discussing such policy shifts in the analysis of negligence duties).

⁵⁰⁵ See *id.* at 12-15 (describing the evolution of rules and exceptions).

⁵⁰⁶ See *id.* at 15-16 (explaining this switch).

⁵⁰⁷ See KELSO & ENGSTRØM, *supra* note 32, at 189.

⁵⁰⁸ See *id.* at 103, 149.

⁵⁰⁹ *Id.* at 185.

organ. Like neurons in the brain, members of the relevant legal system invariably possess conflicting dispositions. When these individuals deliberate together, the group's communal mind necessarily confronts such contraries at the same time, prompting it to exchange information and create alliances. Neuroscientist David Eagleman sees the same symmetry from the science side, describing the brain as a "neural parliament[]" composed of rival political parties which fight it out to steer the ship of state⁵¹⁰ or "representative democracies" that are "built of multiple, overlapping experts who weigh in and compete over different choices."⁵¹¹

Juries operate in identical fashion. As Eagleman points out, "Twelve strangers with differing opinions are tasked with the single mission of coming to a consensus."⁵¹² Simulating coordinative brain function, "[t]he jurors debate, coax, influence, relent – and eventually the jury [as legal brain] coheres to reach a single decision."⁵¹³ In essence, the group finds a stable coordination pattern that sufficiently reconciles the competing views. Yet as new arguments arise, the cognitive equilibrium can tilt one way or the other. Suddenly, the existing pattern destabilizes, and the process repeats all over again.

The common law epitomizes this dynamic process. To see the connection more clearly, imagine the common law not as millions of opinions written by different judges over a millennium, but rather as a series of decisions occurring in the mind of a single individual. Like the mind, the law constantly solves problems and stores its solutions in its memory banks. In the common law, the law's memory consists of the judges' written rationales for their decisions. As these judgments accumulate, the law develops rules, standards, and principles fitted to specific recurring circumstances. Because case decisions create precedents, subsequent judges must consider them each time they face a new problem. Outdated solutions slowly fade away, but canons with continued efficacy grow in persuasive strength until they eventually become ingrained in the law's jurisprudence.

Like epigenetic rules, these embedded legal norms can create contradictory instincts that often lead to conflict. For example, our natural aversion to harm supports duties of care towards others,⁵¹⁴ while our impulses for liberty and against oppression forbid state-imposed duties to aid or rescue.⁵¹⁵ These opposed principles place the law in a tenuous state of metastability. Mimicking the neural circuitry of the brain, courts often reconcile these binaries differently, creating mixed precedents that constantly compete for supremacy. Thus, despite tort law's general reluctance to impose an affirmative duty to act, courts have consistently

⁵¹⁰ EAGLEMAN, *supra* note 241, at 108.

⁵¹¹ EAGLEMAN, *supra* note 129, at 107.

⁵¹² *Id.* at 108.

⁵¹³ *Id.*

⁵¹⁴ See RESTATEMENT (THIRD) OF TORTS: PHYS. & EMOT. HARM § 7(a) (2010) (providing that "[a]n actor ordinarily has a duty to exercise reasonable care when the actor's conduct creates a risk of physical harm").

⁵¹⁵ See DAN B. DOBBS, THE LAW OF TORTS 853-54 (2000) (explaining this well-settled no-duty-to-aid rule).

tempered that rule with a generous list of exceptions.⁵¹⁶ In these situations, the deciding judge cannot ignore the law's cognitive cacophony. Instead, she must adopt a coordinative mindset, weighing the extremes while building a latticework of rules to interconnect them.⁵¹⁷

Obviously, none of this proves that coordination dynamics is the definitive cause of our legal practices. That point certainly has not been shown, if it is susceptible to proof at all. But the foregoing observations do fit the narrative pattern of jurisilience. If human beings are innately conflicted creatures perpetually searching for reconciliation, it should not be surprising that they would pursue that goal using coordinative processes coinciding with their complementary nature.

C. THEORY

Because jurisilience is a story about law and human nature, its explanatory power does not stop at the law's history, content, or process. It extends to any human endeavor related to law, including the development of legal theory itself. Like law, legal theory is a problem-solving practice. As we noted at the very outset of this piece, the central problem of jurisprudence is to fully understand and accurately describe the nature of law. This problem, though complex, is essentially no different from any other difficult quandary facing mankind. Thus, when a legal theorist attempts to pierce this perplexity, she will be subject to the same analytic dynamics as the lawmakers she seeks to study. In fact, we should expect to find within jurisprudence the same cognitive processes and patterns we see in legal systems. As this Section shows, that hunch is well founded. Just as human beings wrestle with their selfish, social, and rational sides, jurisprudence has struggled to coordinate a corresponding trilogy of interpretations. Though some theorists have made overtures toward reconciliation, none has achieved true jurisilience.

1. *Trilogies*

The story of legal theory is a tale with three parts. From its earliest renderings to its most recent iterations, jurisprudence consistently has construed law in three different ways. Plato's *Minos* offers one of the earliest triadic accounts. In *Minos*, Socrates and a companion engage in a dialogue

⁵¹⁶ See *id.* at 854 (noting that this plethora of exceptions has "the effect of creating a duty to act in most instances where a reasonable person would feel compelled to act").

⁵¹⁷ This coordinative approach was especially apparent in *Soldano v. O'Daniels*, 190 Cal. Rptr. 310 (Cal. Ct. App. 1983). There, the California Court of Appeals found that a business has a duty to permit a Good Samaritan to use its phone to place an emergency call, but denied that this obligation was a full-blown duty to aid. See *id.* at 317. Defending its subtle adaptation of the law, the court explained:

The creative and regenerative power of the law has been strong enough to break chains imposed by outmoded former decisions. What the courts have power to create, they also have power to modify, reject and re-create in response to the needs of a dynamic society. The exercise of this power is an imperative function of the courts and is the strength of the common law.

Id. at 318.

about the meaning of law.⁵¹⁸ Three possible definitions emerge from the ensuing discussion. One view is that law is “the enforced command of the state.”⁵¹⁹ Another construction is that law is “the body of settled rules and customs.”⁵²⁰ The final theory is that law is justice and an absolute good.⁵²¹ Though Socrates prefers the last meaning, law in the ancient mind could be an authoritative command, a social custom, or a moral principle.⁵²²

This same jurisprudential pattern repeats over the centuries. Indeed, according to Harold Berman, the three recurring conceptions of law—which he terms “the will of the state,” “custom,” and “right reason”—have predominated throughout history.⁵²³ In American jurisprudence, these views have evolved as formalism, realism, and legal process theory, respectively.⁵²⁴ More generally, they are known as legal positivism, historical-sociological jurisprudence, and natural law theory.⁵²⁵ Positivism itself has defined law as either command or custom; thus, its juxtaposition with natural law also completes the triumvirate. Given their conceptual affinities, we need not dwell on semantics. Nor will we dissect each theory or take pains to distinguish their nuances. Rather, our purpose is simply to reveal the broad human dimensions behind these views and explain their interrelationship.

Each theory of jurisprudence corresponds to an innate human disposition. Command positivism and formalism address the survival impulses of our reptilian brain by instantiating a form of preconventional morality. Because of our moral appetites, we seek both to avoid harm and to obey authority. Our animal instincts reduce these appetites to reflexive rules that activate our emotions and direct our behavior. Thus, as noted above, people have a natural inclination towards formalism’s rigid rule-based approach. When recognized authorities command compliance with these rules, we feel eerily compelled to submit. Should our deference waver, positivism’s promise of punishment reinforces our obedience. People invariably respect and fear the law’s lash even if they do not agree with its use.

Besides force, human beings tend to respond to convention. Our mammalian urge for cooperation imbues us with a profound sense of conformity. This social sense makes people attentive to the needs of others and committed to the good of the group. Struck by this commitment, realists and social theory jurisprudents highlighted the social policies shaping the law from within and the social dynamics influencing lawmakers from without.⁵²⁶ Modern positivists also turned to convention to reaffirm the law’s authority. If lawmakers follow a recognized custom of lawmaking, their

⁵¹⁸ Brian Z. Tamanaha, *What is Law?* (Washington Univ. in St. Louis Leg. Stud. Research Paper No. 15-01-01, 2015), <https://ssrn.com/abstract=2546370>, [<https://perma.cc/JDP2-WRRV>].

⁵¹⁹ A.H. Chroust, *A Note to the Pseudo-Platonic Dialogue Minos*, 15 AM. J. JURIS. 171, 172 (1970).

⁵²⁰ See Tamanaha, *supra* note 518 at 1-3.

⁵²¹ See *id.*

⁵²² See Chroust, *supra* note 519, at 172.

⁵²³ HAROLD J. BERMAN, *THE NATURE AND FUNCTIONS OF LAW* 20 (1958).

⁵²⁴ See generally Sebok, *supra* note 16 (discussing the evolution of these theories).

⁵²⁵ See Tamanaha, *supra* note 518, at 3.

⁵²⁶ See NEIL DUXBURY, *PATTERNS OF AMERICAN JURISPRUDENCE* 78-82, 96 (2001).

shared cooperative activity makes their decisions mutually binding.⁵²⁷ Under this view, our moral appetite for reciprocation is not just a precursor *to* law; it is the ongoing normative dimension *of* law.

Sometimes, however, our social conventions conflict with our authoritative commands. Or, we come to recognize principles more important than such standards or rules. Natural law and legal process theorists contend that such principles are the true law. While naturalists believe in substantive moral imperatives like equality, fairness, and justice, legal process advocates contend that procedural principles secure our legal ideals.⁵²⁸ Similar to a maturing moral agent, each postconventional approach to jurisprudence relies on reason and practical wisdom to identify our natural rights.⁵²⁹ Such rational reflection breeds a logical search for coherence and reconciliation among the law's core concepts. As process founders Henry Hart and Albert Sacks admonished, "striving for consistency is a matter of necessity if legal arrangements are to be workable at all."⁵³⁰ Thus, natural law and legal process do more than establish the law's conscience; like the left-brain interpreter, they also moderate, mediate, and coordinate all of law's governing elements.

Interestingly, postconventionalists themselves cannot agree on the law's moral foundations, so they tend to splinter into separate camps that roughly parallel the triad just discussed. Inspired by the philosophy of Immanuel Kant, deontologists favor individual rights and clear duties to protect them.⁵³¹ Such deontic snap judgments of personal dignity over social welfare are the sort of highly emotional reactions identified in the "footbridge" version of Joshua Greene's aforementioned Trolley Problem experiment.⁵³² By contrast, utilitarians following Jeremy Bentham or John Stuart Mill take a purely social perspective, contending that law should promote the greatest good for the largest number of people.⁵³³ As Greene discovered, this concern for social welfare arises in impersonal decision making scenarios—like the "switch" version of the Trolley Problem—where rational deliberation typically prevails over emotion.⁵³⁴ Finally, some postconventionalists adopt Aristotle's aretaic or virtue ethics, holding that law should reflect abstract principles of justice and fairness, regardless of the private rights or social interests that may be at stake.⁵³⁵

Once again, the human connection within this trilogy is quite palpable, if far from confirmed. After examining these theories, philosopher William Casebeer noticed their apparent neural analogues. Not wanting to overwork

⁵²⁷ See COLEMAN, *supra* note 17, at 96-99, 152-53.

⁵²⁸ See DUXBURY, *supra* note 526, at 254-56; STEPHEN M. FELDMAN, AMERICAN LEGAL THOUGHT FROM PREMODERNISM TO POSTMODERNISM: AN INTELLECTUAL VOYAGE 119-20 (2000).

⁵²⁹ FELDMAN, *supra* note 528, at 121-22.

⁵³⁰ *Id.*

⁵³¹ See Heidi M. Hurd, *The Deontology of Negligence*, 76 B.U. L. REV. 249, 249-54 (1996); Lawrence B. Solum, *Chapter 1 Virtue Jurisprudence: Towards an Aretaic Theory of Law*, 23 IUS GENTIUM 1, 5-6 (2013).

⁵³² See *supra* text accompanying notes 392, 395-397.

⁵³³ See generally David O. Brink, *Mill's Ambivalence About Rights*, 90 B.U. L. REV. 1669 (2010) (discussing Mill's utilitarianism).

⁵³⁴ See *supra* text accompanying notes 391, 393, 394.

⁵³⁵ See Solum, *supra* note 531, at 5-6.

the point, Casebeer concluded: “Jokingly, then, it could be said that these approaches emphasize different brain regions: frontal (Kant); prefrontal, limbic, and sensory (Mill); [and] the properly coordinated action of all (Aristotle).”⁵³⁶ Neuroscientist Michael Gazzaniga was similarly intrigued by the correlation. Acknowledging Casebeer’s observation, Gazzaniga was moved to question: “Are there moral reasoning centers in the brain?”⁵³⁷ Though “[i]t’s surely not as simple as that,” he admitted, “it may well be that intricate and distributed neural networks are active when a person is making certain moral decisions.”⁵³⁸ Indeed, once the brain images from Greene’s moral stories are combined with the lessons of cognitive psychology, this narrative certainly seems to carry some resonance.

But this is only part of jurisilience’s tale. The more dramatic part is how our legal theories relate to each other. The dualist perspective is that such accounts are not related at all. In fact, each theory is independent from and incompatible with the others. If law is merely posited by powerful people, it need not conform to rational principles. Conversely, if law is right reason, then no unreasonable human act can qualify. Positivists recently have begun to soften this line by acknowledging a role for morality.⁵³⁹ Yet they still see jurisprudence in essentialist terms. Since legal theory reveals immutable truths, its entrenched positions cannot change. Consequently, modern jurisprudents remain stuck in an endless competition, espousing contradictions that seemingly can never be reconciled. With this stark truth, we arrive at the greatest paradox of all. Though jurisprudence serves as law’s big brain, it functions like no healthy mind ever does.

Jurisilience cures this cognitive dysfunction. Rather than duck or buck human nature, it thinks exactly like we do. Jurisilience is a dynamic process for coordinating and reconciling apparent inconsistencies in law and legal theory. Under this view, commands, conventions, and principles are complementary concepts. Though they seem antagonistic, they really are inextricably intertwined, mutually defining, and completely coherent ideas. Their mutuality is inclusive, not exclusive. Thus, in one sense, all traditional legal theories get things right. Law *is* a command, a convention, *and* a principle. Human beings naturally respect and recognize all three forms of normative restriction, and at various times and places have treated them as law.

But in a deeper sense, all current approaches are essentially incomplete and ultimately misleading. They highlight different boundary conditions of law’s holistic coordination system but overlook the distinctive dynamics within those parameters. Beneath its outer skin, law’s vital organs are not separate and stable. Instead, they create a politico-socio-moral synergism that constantly changes our conception of legality. In any legal regime, law may include commands, conventions, and principles configured in various

⁵³⁶ See William D. Casebeer, *Moral Cognition and Its Neural Constituents*, 4 NATURE REV. NEUROSCIENCE 840–847 (2003).

⁵³⁷ GAZZANIGA, *supra* note 246, at 267.

⁵³⁸ *Id.*

⁵³⁹ See Greenberg, *supra* note 20 (embracing morality); Scott Herskovitz, *The End of Jurisprudence*, 124 YALE L.J. 1160 (2015) (same).

permutations. It also may meld these legal forms in new and unexpected ways depending on the circumstances. The possibilities are as limitless as the human mind. Just as our triune brain coordinates its competing tendencies, our notion of law must successfully coordinate jurisprudence's conflicted triumvirate.

2. *Overtures*

Admittedly, some legal theorists are beginning to break out of these molds. Since the 1980s, commentators have attempted to explain the evolutionary nature of law.⁵⁴⁰ Indeed, a few have even turned their attention to consilience, complementarity, or coordination dynamics. But these efforts remain seriously circumscribed. In fact, they started off on the wrong foot. Brian Leiter was among the first law professors to call for a naturalized epistemology of jurisprudence.⁵⁴¹ However, he did not apply that methodology to develop a full-blown theory of law or even suggest how such a naturalized jurisprudence should proceed. If anything, he created obstacles to such an endeavor, discrediting the idea of interdisciplinary consilience⁵⁴² and specifically denouncing evolutionary biology as “a fad” with “a shelf life at least as short as [Critical Legal Studies’ deconstructionism].”⁵⁴³

Other entries possess equally debilitating drawbacks. Nicola Lacey has shown greater fidelity to the “complementarity” of philosophy and science, but she too has simply defended that concept without applying it in depth.⁵⁴⁴ While Itzhak Englard presented a complementarity theory of tort law, his account was expressly philosophical in nature, addressed only the field of torts, and misconstrued its unifying principle as a type of compromise or equilibrium instead of dynamic metastability.⁵⁴⁵ Owen Jones, John Mikhail, Paul Robinson, and others, face almost the opposite predicament. Though they support consilience,⁵⁴⁶ they concentrate predominantly on the natural sciences without offering overarching metatheories of law compatible with the humanities.⁵⁴⁷

⁵⁴⁰ See generally E. Donald Elliot, *The Evolutionary Tradition in Jurisprudence*, 85 COLUM. L. REV. 38 (1985) (applying an evolutionary perspective); Hebert Hovenkamp, *Evolutionary Models in Jurisprudence*, 64 TEX. L. REV. 645 (1985) (same); M.B.W. Sinclair, *The Use of Evolution Theory in Law*, 64 U. DETROIT L. REV. 451 (1987) (same).

⁵⁴¹ See generally BRIAN LEITER, NATURALIZING JURISPRUDENCE 121-99 (2007) (advocating a more scientific approach to jurisprudence).

⁵⁴² See Brian Leiter & Michael Weisberg, *Why Evolutionary Biology is (So Far) Irrelevant to Legal Regulation*, 29 LAW & PHIL. 31, 62 (2010).

⁵⁴³ *Id.* at 34.

⁵⁴⁴ See Nicola Lacey, *Analytical Jurisprudence Versus Descriptive Sociology Revisited*, 84 TEX. L. REV. 945, 958-60 (2006) (noting with favor that some scholars are “reopening the effort to find a common cause across the philosophy/social science divide, motivated by the thought that there is a genuine complementarity and scope for productive debate”).

⁵⁴⁵ See Itzhak Englard, *The Idea of Complementarity as a Philosophical Basis for Pluralism in Tort Law*, in DAVID G. OWEN, PHILOSOPHICAL FOUNDATIONS OF TORT LAW 194-195 (1995).

⁵⁴⁶ See Owen D. Jones et al., *Economics, Behavioral Biology, and Law*, 19 SUP. CT. ECON. REV. 103, 139 (2011) (embracing consilience in general and especially the integration of economics, behavioral biology, and law).

⁵⁴⁷ See *supra* note 222 and authorities cited therein.

Admittedly, many legal scholars have highlighted the law's coordinative function.⁵⁴⁸ However, none has fully addressed the source or significance of this feature. Indeed, even where coordination is considered law's *paramount* purpose, the exposition is mostly conceptual. To illustrate, Scott Shapiro argues in *Legality* that law is essentially social planning,⁵⁴⁹ which he describes as the "universal means that enable us to coordinate our behavior intra- and interpersonally."⁵⁵⁰ Acknowledging that humans are "planning creatures" with "a special kind of psychology" for plan development,⁵⁵¹ Shapiro offers no scientific explanation of that planning capacity. Instead, he relies principally on the work of philosopher, Michael Bratman, without providing any extended justification of its empirical merits.⁵⁵²

Richard McAdams' new book, *The Expressive Powers of Law: Theories and Limits*, shares similar deficiencies. McAdams contends that law serves the expressive functions of coordinating and informing social behavior.⁵⁵³ But like Shapiro, McAdams supports his position with limited evidence. While he draws heavily from game theory studies,⁵⁵⁴ he eschews other scientific fields that might reinforce, enrich, or repudiate that research.

In the end, both works offer rich and cogent theories of law's coordinative dimensions. Yet neither attempts to show that law *arises from* man's coordinative nature or that this nature influences our theories *about* law. Instead, they simply embellish jurisprudence's reigning tropes. A dualist at heart, Shapiro does not seek to reconcile positivism and naturalism, but rather repudiates both existing approaches before defending his own reformulated version of positivism.⁵⁵⁵ Though McAdams embraces pluralism, he too shows little interest in reconciliation, proclaiming that his coordination theory can peacefully coexist with other jurisprudential interpretations,⁵⁵⁶ but offering no proposal for *their* coordination.

A few scholars have turned to complexity theory to reveal the law's coordinative contours. But aside from J.B. Ruhl's occasional ruminations on legal theory,⁵⁵⁷ such iconoclasts have approached this question in piecemeal fashion, taking a relatively narrow view of specific fields like environmental and administrative law, mediation and alternative dispute resolution, bankruptcy, health law, international law, land use regulation, intellectual property, cyber law, and telecommunications.⁵⁵⁸ To complicate matters further, none of these complexity ventures directly addresses

⁵⁴⁸ See *supra* notes 33 & 34 and authorities cited therein.

⁵⁴⁹ See SHAPIRO, *supra* note 16, at 195.

⁵⁵⁰ See *id.* at 194.

⁵⁵¹ See *id.* at 119.

⁵⁵² See *id.*

⁵⁵³ See MCADAMS, *supra* note 34, at 5-7.

⁵⁵⁴ See *id.* at 50-56, 63-67.

⁵⁵⁵ See SHAPIRO, *supra* note 16, at 118-19; see generally *id.* at 51-117, 284, 309-12 (attacking prevailing notions of positivism and naturalism).

⁵⁵⁶ See *id.* at 6-7.

⁵⁵⁷ See, e.g., Ruhl, *supra* note 185 (providing a general overview of law's complexity); J.B. Ruhl, *The Fitness of Law: Using Complexity Theory to Describe the Evolution of Law and Society and Its Practical Meaning for Democracy*, 49 VAND. L. REV. 1407, 1419-37 (1996) (using complexity theory to explain the evolution of formalism, realism, and critical legal studies).

⁵⁵⁸ See Ruhl, *supra* note 185, at 909-10 & accompanying notes.

complementarity or coordination dynamics. While Oren Perez explores these concepts, he applies them only to “quasi-legal” systems at the law’s periphery.⁵⁵⁹ In fact, Perez sees no other option, concluding that “the abstract vision” of coordination dynamics “cannot be applied as such to the legal context” because it was created as a “framework to study the brain.”⁵⁶⁰

The most complete account of law’s complexity appears in Professor Hadfield’s new book, *Rules for a Flat World*.⁵⁶¹ In her view, complexity determines the evolution of law,⁵⁶² while law manages the problems of social complexity.⁵⁶³ Those problems begin early on as human beings struggle to stay alive. After people learn to secure basic necessities, their problems become increasingly more complex, progressing from individual survival to social cooperation to specialization and diversification of labor.⁵⁶⁴ Man’s problem-solving mechanisms adapt to these challenges by ascending a ladder of complexity that begins with DNA, is followed by cognition and culture, and culminates in law.⁵⁶⁵

Yet, contrary to complexity theory, Hadfield sees these developments as completed one-way steps, not as dynamic cycles of circular causality.⁵⁶⁶ As a result, she dismisses the relevance of biology for each of the stages above.⁵⁶⁷ Addressing the normative basis of social rules, Hadfield concludes that “[m]ost of these rules do not emerge from ingrained preferences” but arise “instead from social processes” that speak to “what the group will deem okay and not okay.”⁵⁶⁸ These rules “gain their efficacy not from natural inclinations to abide by the rules,” Hadfield continues, “but instead from a critically distinctive feature of human social structure: our reliance on third-party punishment of rule violations.”⁵⁶⁹

Though social preference certainly accounts for some context-specific rules, third-party punishment does not fall into that category. If anything, this universal norm actually undermines Hadfield’s claim. Our *DNA* urges us to cooperate, to reciprocate cooperation, and to punish noncooperators. These instincts produce *epigenetic* rules for loyalty, fairness, and obedience and against betrayal, cheating, and deviation. These rules *prompt* social and cultural punishment practices, which eventually become laws. Because these

⁵⁵⁹ See Oren Perez, *Fuzzy Law: A Theory of Quasi-Legal Systems*, 28 CAN. J. L. & JURIS. 343 (2015).

⁵⁶⁰ *Id.* at 351 n.49.

⁵⁶¹ See HADFIELD, *supra* note 272.

⁵⁶² *See id.* at 58.

⁵⁶³ *See id.* at 59.

⁵⁶⁴ *See id.* at 59-67.

⁵⁶⁵ *See id.* at 5-6, 77-78.

⁵⁶⁶ Although Hadfield uses the holistic *language* of complexity, *see id.* at 77, 79 (describing the circularity of stability and instability cycles), she presents and defends a linear, forward-marching conception of human development, *see id.* at 79 (noting how biology, economics, and social diversity continue their “relentless march forward”).

⁵⁶⁷ *See id.* at 31 (“I find all of this research on the biological origins of morality fascinating and important. But I’m not sure this research can tell us much about the roots of rule-based systems of social order and ultimately law.”).

⁵⁶⁸ *Id.* at 36.

⁵⁶⁹ *Id.*

legal rules have persisted for generations, they have gotten absorbed back into our genetic fabric, thus completing the revolving process of renewal.

Other ventures shade law's complexity but come closer to capturing its coordinative nature. From the 1960s to the 1970s, law professors, Jerome Hall and Edgar Bodenheimer, advocated an "integrative" theory of jurisprudence, which sought "a synthesis of analytic jurisprudence, realistic interpretations of psychological, social, and cultural facts, and the valuable ingredients of the natural law doctrine."⁵⁷⁰ That approach was revived most recently by legal historian, Harold Berman, in his 1988 piece, *Toward an Integrative Jurisprudence: Politics, Morality, History*.⁵⁷¹ There, Berman argued that positivism and natural law theory "are not genuine antimonies[] but only opposite sides of the same coin,"⁵⁷² and along with historical-sociological jurisprudence, are actually "complementary perspectives on law."⁵⁷³ According to Berman, the problem is that the political and moral views are ahistorical, with each theory claiming supremacy as a universal absolute.⁵⁷⁴ When they are placed in historical context, however, a different image of law emerges. We see law as an ongoing process of political, social, and moral reconciliation subject to patterns of change.⁵⁷⁵ Only by combining the insights of each position can we finally realize their "mutual interdependence."⁵⁷⁶

But even these more progressive projects are merely aspirational overtures. While they favor integration, they say little about the source of legal theory's interdependence and even less about its operation. Jurisilience seeks to fill this void. It shows that jurisprudence, like law, is a manifestation of our human nature—competitive, cooperative, *and* coordinative, *all at the same time*. Theories of jurisprudence appear to conflict because man is a creature of complementarity. In reality, these opposed ideas never completely reign supreme, but continually compete to control our thinking as they jockey for position in our minds.

In this respect, legal theory is a lot like a wrestling match. As John Henry Wigmore explained a century ago:

Evolution in Law, as in other cosmic facts, is always the result of a conflict of forces. The situation is very much like that of two men pushing face to face on the pavement, each seeking to pass, or wrestling in a final grip on the mat; in the wrestling match, finally a slight balance of force prevails, and the one man falls on his back, with the other over him as the winner. Then there is equilibrium for a while, but only until the next bout begins. Law is usually

⁵⁷⁰ Edgar Bodenheimer, *Seventy-Five Years of Evolution in Legal Philosophy*, 23 AM. J. JURIS. 181, 204 (1978); see also JEROME HALL, FOUNDATIONS OF JURISPRUDENCE (1973) (especially chapter 6 'Towards an Integrative Jurisprudence'); Jerome Hall, *From Legal Theory to Integrative Jurisprudence*, 33 U. CIN. L. REV. 153 (1964) (advocating integrative jurisprudence).

⁵⁷¹ Howard J. Berman, *Toward an Integrative Jurisprudence: Politics, Morality, History*, 76 CAL. L. REV. 779 (1988).

⁵⁷² *Id.* at 786.

⁵⁷³ *Id.* at 783.

⁵⁷⁴ See *id.* at 787-88.

⁵⁷⁵ See *id.* at 787-88, 795, 800.

⁵⁷⁶ *Id.* at 801.

a series of wrestling bouts; the prize to the final winner signifies the enactment of the winning force as a rule of law. Complete rest may or may not ensue. But the victory does not signify the annihilation of the losing force; it signifies only a slight overbalance in the winning force, followed by a more or less temporary rest, according to the conventions of the game.⁵⁷⁷

Over the years, positivism, naturalism, and social theory have taken turns asserting strangleholds over the field of general jurisprudence. Now that jurisilience has entered the picture, the nature of this exercise comes into sharper relief. Legal theory is not simply an all-or-nothing brawl between wrestling ideas. It is a dynamic drama of coordinated movements and mediated maneuvers that oscillates within flexible parameters until an appreciable reconciliation is reached and the whole process begins anew.

VI. CONCLUSION

From this initial foray into consilience, we finally have a working sketch of *jurisilience*—the inter- and multi-disciplinary account of law and legal theory. Though it is far from complete, jurisilience changes current jurisprudence in several fundamental respects. In contrast to social theory, it argues that law actually does possess an essential and enduring nature; specifically, the defining nature of mankind. Yet contrary to analytic jurisprudence, law's nature is dynamic, multifaceted, and synergetic; not static, monistic, and self-sustaining. Moreover, jurisilience does not rest solely on analytics' philosophical introspection or social theory's scientific empirics. Instead, it seeks consilience among all of the branches of man's knowledge tree.

The result is not just a more coherent form of jurisprudence. It is something different. Jurisilience complements conceptual analysis with empirical facts. It seeks to integrate and reconcile knowledge domains, not to invalidate or prioritize them. By naturalizing its methodology, jurisilience avoids the artificiality of caricatured extremes. Indeed, its central themes have a familiar ring because they echo throughout the natural world. Jurisilience reveals that law, like humanity, is a complex holistic system rather than a collection of incompatible opposites. While law possesses antinomies, it continually reconciles its inner tensions by coordinating its competitive impulses. The same holds true for legal theory. As law's conceptual coordination system, jurisilience illuminates the repeating patterns of our most prominent and persistent schools of jurisprudence.

Like any work-in-progress, jurisilience still has a lot more work to do. My main objective here was to begin building legal theory from its missing scientific foundation upwards toward its current philosophical scaffolding. Besides tracing some historical trends in law, legal systems, and jurisprudence, little attention was given to certain social sciences and the humanities. Thus, it will be imperative to explore these domains more fully,

⁵⁷⁷ John Henry Wigmore, *Planetary Theory of the Law's Evolution*, in 3 THE EVOLUTION OF LAW: SELECT READINGS ON THE ORIGIN AND DEVELOPMENT OF LEGAL INSTITUTIONS 531 (John Henry Wigmore & Albert Kocourek eds., 1918).

incorporating law-related subjects like political theory, economics, epistemology, and moral philosophy. Even where specific postulates are made, many are presented in little more than summary form. Consequently, we must seek to flesh out these hypotheses—first by exploring a larger sample of legal concepts from a more diverse array of disciplines, and then by linking our findings across scholastic borders. Once the details are elucidated, we must develop interdisciplinary standards of reliability, and use them to assess jurisilience’s strengths and weaknesses. Ultimately, this may require conducting empirical studies specifically addressed to legal decision making, investigating the brains and behaviors of subjects solving law’s many problems. Of course, these tasks cannot be performed by jurists alone, but will require extensive collaboration from nonlegal experts who can assist in the creation of a more uniform system of knowledge assessment.

None of this will matter, however, unless we first commit to changing our perspective. By looking at law through bipolar lenses, we cannot help but see a world of bifurcations, binaries, competitions, contradictions, dichotomies, and dualisms. It is not necessarily the truth one sees, but merely the distorting structure of a restrictive perceptual apparatus. Indeed, there would be little point to expanding the search for law’s essence if we are misled at every turn by the same warped vision.

Once we free our minds of such constraints, however, we just might find a whole new reality. Assembling insights from astral and quantum physics, evolutionary biology, neuroscience, complexity theory, moral and developmental psychology, sociology, and anthropology, legal theorists may finally discover, as one early jurist foretold,

That Law in the abstract (like all Nature, physical and intellectual alike) is in an unceasing state of change, in the objective world of its concrete manifestations. In its very essence it is shifting and protean. Forever it is in the process of unmaking and of remaking—a state of perpetual becoming. It unrolls constantly like a web of cloth fed out from the monstrous loom of Destiny. Out into space it projects its internal energy incessantly in new forms. It is an unbroken flux of transient phenomena, each in turn replaced by others. It is that jural member of the social body which forms itself by Nature's inexorable logic of generation.⁵⁷⁸

In dynamic change, then, may lie the ultimate key to jurisilience, for in the words of the same prognosticator, “[t]he majesty of this force makes for the philosophy of law its kinship with poetry as well as with science.”⁵⁷⁹

⁵⁷⁸ Edmond Picard, *The Perpetual Evolution of Law*, in 3 *THE EVOLUTION OF LAW: SELECT READINGS ON THE ORIGIN AND DEVELOPMENT OF LEGAL INSTITUTIONS* 667 (John Henry Wigmore & Albert Kocourek eds., 1918).

⁵⁷⁹ *Id.* at 678.