

Complexity, the Generation of Legal Knowledge, and the Future of Litigation

Ronald J. Allen



ABSTRACT

The central problem of rationality is to tame and domesticate the overwhelming complexity the human mind faces in its efforts to survive and thrive in a complex, unpredictable, and hostile universe. Much of the history of the human race is essentially the story of its expanding capacity to do just that, and the survival benefits that this process has bestowed on the species. Legal systems in general are part of the story of taming complexity, and the modern American legal system is a particularly important part. In an effort to understand the nature of legal systems, much legal scholarship, like the scientific endeavors in many other disciplines, engages in reductivist efforts that simplify and then tries to explain or engage in normative efforts about a certain set of phenomena, typically through a priori reasoning. An outstanding and enormously influential example is economic analysis of law. Two recent publications of this kind particularly pertinent to *The Future of Litigation* are the extraordinary efforts of Louis Kaplow to explain, justify, and reform the law of burden of proof and essentially the entire judicial process. In contrast to such reductivist efforts is the methodology of Stephen Yeazell, which might be called the reformed judicial process school. The reformed judicial process school embraces rather than suppresses the complexity of the matter under investigation, in this case the judicial system, and employs whatever tools of analysis seem most appropriate to the task at hand, including careful doctrinal exegesis, the application of microeconomics, or empirical research. The result (whatever Yeazell or others might have intended) is careful, bottom-up empiricism rather than top-down prescription. Each approach has its utility and limitations. In the effort to advance knowledge of the operation of the legal system, work like Yeazell's succeeds better than reductivist approaches. Yeazell's work succeeds because he recognizes the implications of the legal system's complexity and its dynamic nature, while the legal economists fail in that regard. In predicting *The Future of Litigation*, the work product of the reformed judicial process school is more likely to be influential than that of standard microeconomic theorizing. This is particularly evident in the pleading area that has been thrown into turmoil by the recent Supreme Court decisions in *Iqbal* and *Twombly*.

AUTHOR

Ronald J. Allen is the John Henry Wigmore Professor of Law at Northwestern University; Fellow at China Political Science and Law University; and President of the Board of Foreign Advisors at the Evidence Law and Forensic Sciences Institute at China Political Science and Law University.

Christopher Swartout, a 2011 graduate of the Northwestern School of Law, did a Senior Research Project with me that related to some of the topics I discuss in this paper, and I am indebted to his efforts. I am also indebted to Michael Pardo's helpful comments on a draft and to John Golden for straightening out aspects of the example of a water molecule tumbling down the mountainside.

TABLE OF CONTENTS

INTRODUCTION.....	1386
I. THE LIMITS OF DEDUCTIVE APPROACHES.....	1388
II. <i>IQBAL</i> AND <i>TWOMBLY</i> AS EVIDENCE OF THE LIMITS OF RULES	1391
III. DIFFERENT SCHOLARLY APPROACHES: YEAZELL AND KAPLOW	1396
IV. EMBRACING COMPLEXITY	1402
V. MUDDLING THROUGH WITH NETWORKS	1406
CONCLUSION	1411

INTRODUCTION

As people as diverse as Yogi Berra and Niels Bohr have periodically reminded us, predictions, especially about the future, are difficult.¹ One might thus tread carefully throughout the landscape of this symposium on the Future of Modern Litigation. Although I am fairly confident that Modern Litigation has a Future, and probably quite a robust one at that, I am considerably more diffident about what its contours might be. I am quite confident, by contrast, of the reason why I lack confidence about any such prognostication, and the matter is quite simple: complexity. Predictions go hand in glove with computational complexity. Generally speaking, as the number of variables pertinent to a problem and their potential ways of interacting decreases, the ability to foresee and compute outcomes increases, but of course the obverse is true as well. I believe it to be true that most human affairs involve innumerable variables with unknown interactions among them. Thus the central challenge of the human condition is taming the bewildering and hostile complexity of the universe, and it is precisely this phenomenon that has generated the many useful tools that fill the cognitive and rationality toolboxes.²

One of the most powerful of those tools is straightforward generalization and deduction, for precisely the reason noted at the very beginning of this paper. If one can state the necessary or sufficient conditions of events—in other words, if one can construct what normally passes for a rule—predictions become tractable, the future unfolds in an orderly fashion, and the probability of survival goes up markedly, which suggests the impulse toward rule based reasoning may be hardwired in humans. If your offspring go down to the river and are eaten by alligators, and you do not generalize from this, your genes are likely to die out rather quickly.

One sees the pull of this mode of thinking in much legal scholarship, both in conventional doctrinal work and in law and economics, which has been the primary rival to conventional legal scholarship for the past half-century or so.³

-
1. See YOGI BERRA WITH DAVE KAPLAN, WHEN YOU COME TO A FORK IN THE ROAD, TAKE IT!: INSPIRATION AND WISDOM FROM ONE OF BASEBALL'S GREATEST HEROES 159 (2001) ("The future ain't what it used to be."); ARTHUR K. ELLIS, TEACHING AND LEARNING ELEMENTARY SOCIAL STUDIES 431 (1970) (quoting Bohr as saying, "Prediction is very difficult, especially about the future"). Note that attribution of the Bohr quote is disputed. See, e.g., Felicity Pors, Letter to the Editor, *The Perils of Prediction, June 2nd*, ECONOMIST (July 15, 2007, 5:59 PM), http://www.economist.com/blogs/theinbox/2007/07/the_perils_of_prediction_june.
 2. See Ronald J. Allen, *Rationality and the Taming of Complexity*, 62 ALA. L. REV. 1047, 1049–50 (2011).
 3. Empirical legal studies may be the new wave in legal scholarship, posing interesting new issues.

The primary methodology of doctrinal work involves ordering the legal materials in a tidy and useful way, pointing out logical implications and potential contradictions. Although I doubt that its practitioners explicitly think in the terms I am employing today, implicitly they are modeling their phenomena as static and amenable to top-down ordering and manipulation. This characterization is by no means demeaning. The great legal advances of the first fifty years of the twentieth century were largely of this sort, and are embodied in the great treatises of Evidence, Torts, Contracts, Property, and so on.⁴ This same approach, interestingly, drives particle physics, the field some think to be the most spectacular success story in the annals of human knowledge,⁵ although there the knowledge is embedded in successful experiments rather than treatises.

Although law and economics is often seen as challenging the basic approach of conventional legal scholarship, in fact it is methodologically highly similar. The primary difference lies in where the model being unfolded in an orderly fashion comes from. In conventional legal scholarship, it comes from the logic of sources of law themselves, though this logic is occasionally criticized, to be sure, from an external normative position. In law and economics, it comes largely from utility optimization as explicated by Chicago School microeconomics, in which the denouement is that some set of legal arrangements is or is not economically rational by reference to a certain conception of that phrase.⁶

Both of these approaches to legal scholarship also share important methodological similarities to an aspect of the central jurisprudential debate of the last fifty years, the Hart-Dworkin debate, and in particular Dworkin's concept of law as integrity. Conventional legal scholarship implicitly embraces the idea that complex areas can be made orderly, as does law as integrity. And law and economics on the one hand and law as integrity on the other embrace the potentialities of global top-down, deductive theories as the means of making those complex areas orderly.

Although again I doubt many practitioners of either art think in these terms, if these approaches are like, and thus have the imprimatur of, spectacular

-
4. See generally, e.g., AMERICAN LAW OF PROPERTY; ARTHUR LINTON CORBIN, CORBIN ON CONTRACTS; W. PAGE KEETON ET AL., PROSSER AND KEETON ON TORTS; JOHN HENRY WIGMORE, WIGMORE ON EVIDENCE.
 5. See, e.g., Lawrence M. Krauss, *A Blip That Speaks of Our Place in the Universe*, N.Y. TIMES, July 10, 2012, at D2 (describing the search for the Higgs particle as "cap[ping] one of the most remarkable intellectual adventures in human history"); Vasudevan Mukunth, *Covering Particle Physics*, HINDU (Dec. 9, 2012), <http://www.thehindu.com/opinion/blogs/blogs-the-copernican/article4181068.ece> (explaining the complexity of following the field because it covers everything in the universe).
 6. See, e.g., William N. Eskridge, Jr. & Philip P. Frickey, *Legislation Scholarship and Pedagogy in the Post-legal Process Era*, 48 U. PITT. L. REV. 691, 702–10 (1987).

success stories like physics, what could be wrong with emulating its methodology? Well, a lot as it turns out. I will give two examples—one apocryphal and the other real—that demonstrate the limits of deductive, rule-bound approaches, and then I will turn to how the debate over the recent Supreme Court pleading cases, *Iqbal*⁷ and *Twombly*,⁸ embodies the lessons of the examples. I will then turn to a recent economic explanation of procedural matters and law as integrity to explore further the two examples of rule-bound approaches to legal questions that further demonstrate the limits of that methodology. I conclude with some remarks on what the alternative to these rule-bound approaches might be.

I. THE LIMITS OF DEDUCTIVE APPROACHES

First, the somewhat apocryphal example of the limits of top-down, deductive reasoning. Suppose a person eager to demonstrate the power of causal physical laws were asked if he could predict where a certain water molecule at the top of a mountain stream would end up at the bottom.⁹ “Of course this is theoretically possible,” would be the reply, “all physical interactions are the function of quite well known and predictable physical laws. All one needs to know is the initial position and momentum of the water molecule and we can predict with certainty where it will end up.”¹⁰ “But,” came a reply from a skeptic, “don’t you also need to know the configuration of the stream bed, and the turbulence that might cause?” “Theoretically, yes, but let’s just model this as a water molecule flowing down a perfectly flat, straight surface.”

“But,” the skeptical voice pipes up again, “don’t you also need to know the initial position and momentum of all other water molecules that might interact with the one whose trajectory we are mapping, and aren’t there trillions and trillions of those?” “Of course, far too many to be computationally tractable, so now we need to model this as involving a perfectly flat surface and with water molecules whose initial momentum result in nothing but the force of gravity pulling the water molecule in question down the perfectly flat, straight surface.” The skeptic again: “Is that all of the adjustments we need to make? What about weather conditions? Could a change in weather conditions, and for that matter

7. *Ashcroft v. Iqbal*, 556 U.S. 662 (2009).

8. *Bell Atl. Corp. v. Twombly*, 550 U.S. 544 (2007).

9. No one well versed in physics would do this, of course; I am simply using this story to make a point about modeling.

10. For the physics cognoscenti, obviously uncertainty principles might start getting in the way here, but let’s put that aside.

the interactions of the water molecule with gas particles, affect things?” “Again, you are right, so we must add to the model perfectly still and unchanging atmospheric conditions. That should be the final adjustment we need to make.” “I don’t think so,” the skeptic might add, “isn’t it possible that our particular molecule might just evaporate and never reach the bottom of the stream?” “Quite so, so obviously we need to add that all of this is occurring in a closed system with no interaction between the stream and the atmosphere.” “In short, you really have no idea where a water molecule will end up, and there is no way of knowing, is there?” presses the skeptic. “As I said, in theory it is possible and I have begun to create a model for doing so.”

It is precisely the kinds of considerations latent in the above example that led to the field of fluid dynamics,¹¹ which employs numerous rough approximations that collectively permit useful but always inaccurate predictions to be made about the movement of particles within fluids.¹² In the water molecule case, for example, if someone were actually forced to make a prediction about where a molecule might end up, the prediction would be that the particular water molecule would end up in the riverbank or some other obstruction, in the air, or at the bottom of the hill. At the same time, quite precise predictions and control of the flow and movement of liquids and gases are obtainable. Fluid dynamics embraces the dynamic environment but at the cost of much less accurate retail predictions about particles, which is not its focus in part because of the futility of such a focus.

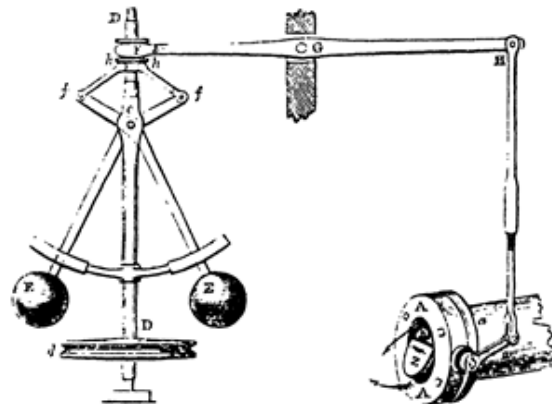
Consider another case that has become one of my favorite examples of the critical difference between computable and noncomputable solutions to problems, because it shows that noncomputable solutions can nonetheless generate very precise results.¹³ The textile industry fueled the industrial revolution in England. Steam engines provided the plentiful source of energy required to weave cloth, but in addition the output had to be very consistent. The output of a steam engine is quite variable, however. It depends on all sorts of things including weather conditions and the heat of the fire. Adding a flywheel helped with output consistency, but not enough. Minute adjustments were constantly required. The solution to this problem conceivably could be computational:

-
11. I do not mean “led” chronologically but metaphorically. People studying physical forces employed different kinds of tools to deal with different kinds of tasks.
 12. See, e.g., P.J. Roache, *Quantification of Uncertainty in Computational Fluid Dynamics*, 29 ANN. REV. FLUID MECHANICS 123, 123–24 (1997) (“I consider here only *a posteriori* error estimation, being of the opinion that useful *a priori* estimation is not possible for nontrivial fluid mechanics problems.”).
 13. I am indebted for the example and the picture below to Tim Van Gelder, *What Might Cognition Be, if Not Computation?*, 92 J. PHIL. 345, 347–50 (1995).

- (1) Measure the speed of the flywheel.
- (2) Compare the actual speed against the desired speed.
- (3) If there is no discrepancy, return to step 1. Otherwise,
 - a. Measure the current steam pressure;
 - b. Calculate the desired alteration in steam pressure; and
 - c. Calculate the necessary throttle valve adjustment.
- (4) Make the throttle valve adjustment.
- (5) Return to step 1.

Unfortunately, the computational solution requires a costly person doing it, and it may still fail; it also involves never-ending iterated steps made over time. In 1788 James Watt invented the centrifugal regulator that solved the problem mechanically. He placed movable arms on a spindle at the center of the flywheel that transmit the flywheel's motion instantaneously to the valve regulating the flow of steam.¹⁴ As the flywheel speeds up, the arms extend, and as it slows the arms retract, and the valve opens and closes until the proper calibration is reached. Here is a picture:

Figure 1. The Watt centrifugal governor¹⁵



14. RICHARD L. HILLS, JAMES WATT: HIS TIME IN ENGLAND, 1774–1819, at 58–65 (2005).

15. Van Gelder, *supra* note 13, at 349 fig.1.

Much of the law is written as though a computational solution, akin to the first option for regulating the speed of the flywheel, were available to solve whatever problem it is regulating. In truth, static rules often work quite well. A vast literature has arisen in the last twenty-five years or so justifying that vision of rules,¹⁶ essentially arguing that mistakes of over- and underinclusiveness is the price to be paid for the social stability that comes from rules with hard edges. But of course, much of the first year of law school is dedicated to driving just such thoughts out of our first-year students' minds. A rule is given followed by a hard case that presses the meaning of the rule. The legal process approach to the first-year curriculum is an emphatic rejection of hard positivism (by which I mean legal formalism), no matter what anyone might be thinking while they are engaged in that form of instruction. But the important point here is that all around us we see the struggle with complexity, whether of physical forces or of the human condition. In that effort, rules are wonderful tools in their proper domain, but not so wonderful when asked to achieve what, for rules, is impossible.

II. *IQBAL* AND *TWOMBLY* AS EVIDENCE OF THE LIMITS OF RULES

Understanding the limits of rules enlightens the debate over the Court's actions in *Iqbal* and *Twombly*. The standard criticisms, including those from Yeazell,¹⁷ are that the court replaced the prior rule with a new rule and did so without utilizing the process created by the Rules Enabling Act that calls for large scale consultative efforts, as well as substantial public comment and feedback.¹⁸ Moreover, the new rule was normatively disfigured, through its creation of steep hurdles that some plausibly meritorious cases might fail to meet in the new world. We will start with the first two points, that the Court created a new rule and did so without engaging the rules drafting process. These are really quite different points. In my opinion the first is wrong and the second is interesting regardless of the falsity of the first. The third point is misguided, as I shall explain.

Federal Rule of Civil Procedure 8 requires a short and plain statement showing the plaintiff is entitled to relief. The Court had interpreted this in

16. See, e.g., LARRY ALEXANDER & EMILY SHERWIN, *THE RULE OF RULES: MORALITY, RULES, & THE DILEMMAS OF LAW* (2001); FREDERICK F. SCHAUER, *PLAYING BY THE RULES: A PHILOSOPHICAL EXAMINATION OF RULE-BASED DECISION-MAKING IN LAW AND IN LIFE* (1991); see also ALAN H. GOLDMAN, *PRACTICAL RULES: WHEN WE NEED THEM AND WHEN WE DON'T* (2004).

17. Kevin M. Clermont & Stephen C. Yeazell, *Inventing Tests, Destabilizing Systems*, 95 IOWA L. REV. 821, 849–50 (2010).

18. 28 U.S.C. §§ 2071–2077 (2006).

*Conley*¹⁹ to mean that the defendant had to show that there was no conceivable set of facts consistent with the plaintiff recovering, which means (assuming the rule is coherent, which may not be the case) that the complaint only had to meet the tests of logic and materiality.²⁰ Did the complaint articulate a cause of action that existed in the real world, and were all the necessary components of the cause of action referred to? The Court rejected this as an all-purpose test in the *Iqbal/Twombly* cases, and asserted instead that the complaint had to set forth a plausible claim for recovery. Much of what the Court went on to say about this test makes literally no sense at all²¹ (which is why my last parenthetical proposes incoherence as a possible explanation of things). But it seems clear, and I am going to assume, that this means at least what many of the cases' critics say it means: to wit, that some plaintiffs have to do more in their complaints than merely state logical truths. Plaintiffs must additionally demonstrate a realistic chance of winning on the facts. This means that some set of cases that previously had moved from the pleading stage to the discovery stage will not anymore and will be taken out of the system by Rule 12 motions. So far as it goes, I agree with this. But the critics neglected the *Erickson*²² case that came down at the same time as *Iqbal/Twombly* for which the only explanation is that the Court applied the *Conley* test. To be explained, then, is not just the apparent lone wolf behavior of the Court in *Iqbal/Twombly* but also its equally apparent and simultaneous reaffirmation of the much-cherished (in some quarters) *Conley* test.

The civil procedure community for the most part seems to have missed this confluence of events, but this is precisely when things get interesting. What could explain what the Court did and the community's reaction to it? The answer might possibly be that the Court was viewing the litigation process as a dynamic rather than static entity, the regulation of which may be impeded by the hard-edged concept of a rule that the community was insisting upon.

Notwithstanding the lessons of the legal process school and the efforts of first-year law teachers, humans in general—and maybe legally trained humans even more so—are inclined to think of rules as stating sets of necessary and sufficient conditions from which can be deduced solutions to problems; this is where the hard edge of rules comes from. As I noted above, there are probably survival benefits to this view, which have hard wired it in our brains.²³ The

19. *Conley v. Gibson*, 355 U.S. 41, 45–46 (1957).

20. *Id.*

21. See Ronald J. Allen & Alan E. Guy, *Conley as a Special Case of Twombly and Iqbal: Exploring the Intersection of Evidence and Procedure and the Nature of Rules*, 115 PENN ST. L. REV. 1, 33–37 (2010).

22. *Erickson v. Pardus*, 551 U.S. 89, 93–94 (2007) (per curiam).

23. For an elaboration of the significance of this, see Allen, *supra* note 2, and Allen & Guy, *supra* note 21, at 22.

community's reaction to *Iqbal/Twombly* was from this perspective. Rule 8 is a rule and it had been made even more rule-like with the *Conley* gloss. Many responded with outrage, asking how the Court could just throw this rule overboard. Well, rules serve purposes, and what happens when the assumptions that a rule was premised on no longer pertain? Do you apply the rule when its foundations have eroded, or do you construct a different rule sub silencio? This is the question that, in my opinion, should have reverberated over the community, but instead was crowded out by claims of the Court's faithlessness to the rules drafting process.²⁴

The reason this question should have reverberated over the community is that in many ways modern litigation is not captured by the assumptions the rules drafters made in the 1930s. The rules drafters assumed that the problems were procedural complexity and its attendant transactions costs and that the solution was to get to cheap and readily available discovery in which the costs would tend to be symmetrical over the parties, in part because the relevant information was as well. In some cases today, those assumptions may hold, and this explains *Erickson*. But in other cases the assumptions do not—and *Iqbal* and *Twombly* are paradigmatic examples of this. In *Iqbal*, applying the normal rule had the potential to seriously compromise important state functions by impeding not only the normal course of business of the Justice Department but also the nation's response to terrorist threats. In *Twombly*, letting a plaintiff past the pleading stage meant enormous asymmetrical costs with their attendant capacity to generate dramatically suboptimal results, because even guiltless defendants could not afford the resulting draconian discovery costs. It is perfectly plausible to see applying the *Conley* gloss in such a context as itself creating a new rule, and one that would potentially have dramatically counterproductive consequences. One of the oddities of the present community's views of the pleading problem is that the *Conley* gloss is just that—a gloss on the rule, and not the rule itself. The oddity comes from criticizing one case by reference to another.

Rather than creating a firestorm of criticism because of the Court's failure to apply *Conley* when it quite reasonably did not apply, these cases could have generated jurisprudential reflection on the nature of rules and their limits. This is where Yeazell's second point becomes critical, and why, in my opinion, the future will lie with him.

His second point is to castigate the Court for neglecting the rulemaking process. In one sense this may be unfair because the demands of litigation are

24. The voice crying in the wilderness is Allen & Guy, *supra* note 21, but then neither of us is a card-carrying member of the civil procedure community.

immediate, but in another sense he is exactly right, although again for a reason that is not part of the current discussions within the community. The advantage of the rule drafting procedure is not so much the values currently cherished by the community of expertise and time to reflect, although these are by no means trivial. The real advantage is that the drafting process instantiates a network, and indeed a series of interacting networks. Networks, like distributed computer processing, have the capacity to handle enormous amounts of information that would otherwise be computationally intractable.²⁵ So, with all due respect to the people like Yeazell who are true experts and make significant contributions to the rulemaking process, the real advantage of the process is the exponential increase in the capacity to process information from any source that networks provide.²⁶ By saying this, I do not demean the formal aspects of the procedure that the community has in mind when it criticizes the Court for bypassing it. Something has to be done with the knowledge that is generated and that falls to the Yeazells of the world. But the knowledge that has to be processed is not limited to them; it potentially includes anyone anywhere with a point of view or datum, which networks allow people to collect and manipulate efficiently.²⁷

Iqbal and *Twombly* are thus the vehicles by which the civil procedure community could have begun addressing the future of the generation of knowledge about the legal system, a process that in my opinion must embrace the distinction between static and dynamic systems, come to terms with the implications of complexity for any rule-based system including the legal system, and begin thinking systematically about the implications of networks for legal structures. The third criticism of the cases, that a deserving plaintiff may actually not get past the pleading stage, is also put in stark relief from these perspectives. The civil procedure community and the evidence community are obsessed with the implications of errors but in different ways and with equally socially perverse consequences. As just noted, the civil procedure community obsesses about the risk that a plaintiff will be wrongfully pushed out of court before putting a defendant to the task of discovery. The evidence community, by contrast,

25. PAUL THAGARD, COMPUTATIONAL PHILOSOPHY OF SCIENCE (1988).

26. I say more about networks below. "Networks" is the current embodiment of the textual point, but it traces its intellectual roots back to the wonderfully creative era in epistemology in the middle of the last century, one insight of which was the social aspect of knowledge. See CRITICISM AND THE GROWTH OF KNOWLEDGE (Imre Lakatos & Alan Musgrave eds., 1970); ALVIN I. GOLDMAN, KNOWLEDGE IN A SOCIAL WORLD (1999); STEPHEN TOULMIN, HUMAN UNDERSTANDING: THE COLLECTIVE USE AND EVOLUTION OF CONCEPTS (1972).

27. Networks are not magical, and do not always work the way we wish they would. See, for example, ANDREW SCHRANK & JOSH WHITFORD, WHEN NETWORKS FAIL: UNCOVERING THE HIDDEN WEAKNESSES IN THE GLOBAL ECONOMY (forthcoming 2013), the forthcoming book which has been widely discussed on the web.

obsesses about the ratio of errors at trial, in particular minimizing total errors, maintaining equality between plaintiffs and defendants, and skewing errors against the State in criminal cases.

To be sure, both obsessions have social value. A wrongfully rejected plaintiff imposes social costs and there is some value in treating civil plaintiffs and defendants equally and the State and criminal defendants unequally. But a wrongfully sued defendant (in other words, one in fact not liable) has just as much a claim on our respect as a plaintiff, which is where the evidence obsession gets it right. To make defendants defend undeservedly is exactly equivalent to foreclosing a deserving plaintiff. Thus the only sensible question for the proceduralist to ask is exactly that asked of the evidence community: To wit, what is the distribution of errors caused by any procedural structure?

But that is not good enough. The legal system is part of a larger dynamic social system. Even if the world can heuristically be divided into legal behavior (the behavior involved with enforcing legal rights) and primary behavior (all of the behavior of everyday life), the two obviously influence one another. Indeed, one of the points of the law and its enforcement is to directly affect primary behavior. But the interconnections run considerably deeper. Intelligently planned primary behavior will take into account the demands of legal behavior.²⁸ A very good defense to not being sued is to have perpetuated the admissible and unimpeachable evidence that one violated no legal right of another.

But the interconnections run more deeply still. Many disputes are resolved in the shadow of legal behavior. An intelligent social planner presumably would want to optimize the total output of those decisions and the ones made at trial. Both sets involve resolutions of legal disputes and identical distributions of social welfare. To give a sharp example, a priori a completely disastrous legal system could be socially optimal because of the incentive effects it gives for its avoidance. Or the opposite might be true. In my opinion, the procedural and evidentiary communities have been much too myopic in looking at their fields either through the lens of pretrial maneuvering or of results at trial. The solution on offer here is

28. In Louis Kaplow's two recent papers, somewhat remarkable for their lack of engagement with the pertinent literature, the author claims to have discovered this and various other points that are commonplace within the field of evidence. See Louis Kaplow, *Burden of Proof*, 121 YALE L.J. 738 (2012) [hereinafter Kaplow, *Burden of Proof*]; Louis Kaplow, *Multistage Adjudication*, 126 HARV. L. REV. 1179 (2013) [hereinafter Kaplow, *Multistage Adjudication*]. On this particular claim, see Allen, *supra* note 2 and Ronald J. Allen & Larry Laudan, *Deadly Dilemmas*, 41 TEX. TECH. L. REV. 65 (2008). Larry Laudan and Alex Stein have both written books motivated by just this point. See LARRY LAUDAN, *TRUTH, ERROR, AND CRIMINAL LAW: AN ESSAY IN LEGAL EPISTEMOLOGY* (2007); ARIEL PORAT & ALEX STEIN, *TORT LIABILITY UNDER UNCERTAINTY* (2001); ALEX STEIN, *FOUNDATIONS OF EVIDENCE LAW* (2005).

to begin to look at these systems as the complex dynamic and interactive systems that they are, which to reiterate is precisely why *Iqbal* and *Twombly* are so interesting.

III. DIFFERENT SCHOLARLY APPROACHES: YEAZELL AND KAPLOW

The advantage of Yeazell's approach to scholarship is that it recognizes at least implicitly many of the points made above. Thus its call for the networks entailed by the rules drafting process and thus also the significance of empirical work that allows a priori assumptions and rule based predictions to be tested, which Yeazell has also engaged in.²⁹ The generation of knowledge about the future legal system, and the evolution of the system itself, will be determined by the fact and its recognition by scholars that the legal system is a complex, dynamic one that must be studied by the tools appropriate to such systems. That will, of course, on occasion involve rules understood in a classic static way but on other occasions it will entail the tools of complexity and systems theory, empiricism, and the implications of networks will assume ever greater significance.³⁰

Two recent papers by Louis Kaplow stand in marked contrast to the subtleties of Yeazell's approach to understanding the nature of the legal system. One examines the pretrial process generally, and the other examines burdens of proof explicitly from a social welfare point of view.³¹ Although economic and doctrinal analysis of law are often viewed as antithetical and as competitors, standard law and economic work such as Kaplow's is the epitome of rules-based reasoning. It posits typically a single rule—social welfare maximization, cost avoidance, efficiency of some sort—and then rigorously pursues the logic of the matter.³² In simple environments, this may be an effective strategy; in complex environments it is typically not. Kaplow applies this logic in a very complex environment, and as a result the analysis is, literally, completely useless for predicting or prescribing anything of interest about the legal system. He is like the theoretical physicist unable to say anything at all useful about where any particular water molecule might end up.

29. See, e.g., Clermont & Yeazell, *supra* note 17.

30. A good introduction to the general area of networks is THE STRUCTURE AND DYNAMICS OF NETWORKS (Mark Newman et al. eds., 2006); a good introduction to complexity theory is JOHN L. CASTI, COMPLEXIFICATION: EXPLAINING A PARADOXICAL WORLD THROUGH THE SCIENCE OF SURPRISE (1994).

31. Kaplow, *Burden of Proof*, *supra* note 28; Kaplow, *Multistage Adjudication*, *supra* note 28.

32. "The Article's method is to ask what procedural rules best advance social welfare, wherein the two central considerations are taken to be the legal system's effects on behavior—deterrence of harmful conduct and the chilling of desirable activity—and total system costs." Kaplow, *Multistage Adjudication*, *supra* note 28, at 1187.

The burden of proof article involves a considerably less complex world than that of pretrial litigation. Kaplow's basic point is that burdens of proof act ex post and thus do not properly incentivize behavior. He is wrong about the effect of the burden of persuasion as conventionally understood, but I put that aside.³³ I will show that his replacement remains unhelpful, regardless of the state of conventional understanding.

Rather than asking questions ex post about the probability of who did what, liability should be decided on the basis of what Kaplow calls evidence thresholds. Primary behavior—everyday activity—will be associated with differing mixes of benefits and harm. Driving is a good example. It is quite useful but can also be quite deadly. According to Kaplow, the legal system should analyze conduct according to its potential mix of benefit and harm and subscribe liability probabilistically. For example, a very low probability of committing a particular act will justify liability if, in the set of such acts so identified by that low probability, social harm greatly exceeds social benefit. And the reverse may be true. In order to impose liability in connection with some other category of primary behavior, efficiency may require a very high probability of the act having been committed. According to Kaplow, the burden of proof should be set discretely for each relevant category to ensure socially optimal outcomes.

Of the numerous difficulties with this approach, two make the point that interests me. First, it will be literally impossible to set up the evidence thresholds that capture all relevant categories of conduct and the accompanying concentrations of benefit and harm. Worse yet, his model omits a critical element: the dynamic nature of society. Once any threshold is set, people will respond to

33. It is always interesting to have individuals from other fields explaining the errors of those knowledgeable in the primary field, but it helps if the critic has a basic understanding of the field being colonized, which is missing in this case. The legal system as a whole has numerous mechanisms that yield plausibly economically rational results and are in fact implemented by the standard conception of burdens of proof. For details and citations, see Ronald J. Allen & Alex Stein, *Evidence, Probability, and the Burden of Proof*, 55 ARIZ. L. REV. (forthcoming 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2245304. Kaplow is also apparently unaware of works that are directly on point to his that both demonstrate the literal impossibility of his probabilistic approach and develop the actual manner in which legal factfinding occurs. He says, for example, "Even regarding final adjudication, the question of how best to make decisions has also been largely neglected until quite recently," and then cites his article, *Burden of Proof*. Kaplow, *Multistage Adjudication*, *supra* note 28, at 1186 n.30. On the contrary, this question has been a dominant issue in evidence scholarship for over thirty years. See, e.g., Ronald J. Allen, *A Reconceptualization of Civil Trials*, 66 B.U. L. REV. 401 (1986); Ronald J. Allen, *Factual Ambiguity and a Theory of Evidence*, 88 NW. U. L. REV. 604 (1994) [hereinafter Allen, *Factual Ambiguity*]. Recent work has demonstrated that juridical factfinding is almost surely not probabilistic, because it cannot be. Ronald J. Allen & Michael S. Pardo, *The Problematic Value of Mathematical Models of Evidence*, 36 J. LEGAL STUD. 107 (2007); Michael S. Pardo & Ronald J. Allen, *Juridical Proof and the Best Explanation*, 27 LAW & PHIL. 223 (2008).

exploit it as best they can. Thus, Kaplow's model must not only have the unobtainable thresholds but also must predict the future. And predictions about the future, as I noted above, are the most difficult kinds of predictions to make.

As to the first difficulty, Kaplow's approach requires that the relevant categories of activities suitable for regulation, his evidentiary thresholds, be identified in advance. These categories must be quite general, for otherwise it is obvious that, if every single act of a person must receive a unique analysis under his proposal, his proposal is equivalent to our theoretical physicist's modeling of the path of water molecules. But there is no alternative to such finely grained analysis. One gets a clue about this from Kaplow's articles, which studiously avoid articulating these critical evidentiary thresholds. His articles contain no well-specified examples because there are no grounds to generalize. All forms of primary behavior will inevitably contain numerous subsets of activity featuring different levels of harm and benefit. For example, "driving a car" is an utterly useless Kaplow category. Its subcategories range from the most careful, attentive drivers to reckless cellphone addicts and drunks. Operationalizing Kaplow's proposal would require articulating all the categories in between and doing a reliable cost-benefit analysis on each of them.

Even those categories that might appear to be obvious are more complicated than they seem. For example, drunk driving might be socially useful at times. Suppose a catastrophe of some sort that requires people to be transported to the hospital. Enlisting a drunk driver or two may save lives. Or what if an expectant father mistakes when the drive to the maternity hospital might occur, and the water breaks at an inconvenient time in relation to his imbibing? This also assumes we know what the category drunk driving contains. Risks vary dramatically over the amount imbibed, and for that matter the capacity of the person doing the imbibing.

Similarly, consider cell phone use, which is becoming as associated with automobile accidents as alcohol is.³⁴ Cell phone use for trivial purposes while

34. See, e.g., DAVID L. STRAYER ET AL., FATAL DISTRACTION? A COMPARISON OF THE CELLPHONE DRIVER AND THE DRUNK DRIVER (2003), available at <http://www.psych.utah.edu/AppliedCognitionLab/DrivingAssessment2003.pdf> ("[C]ell-phone drivers may actually exhibit greater impairments . . . than legally intoxicated drivers."); see also NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., DISTRACTED DRIVING 2009, at 2 (2010), available at <http://www-nrd.nhtsa.dot.gov/Pubs/811379.pdf> (reporting that in 2009, 18 percent of all fatal distracted-driving crashes involved a driver using a cellphone or having one in his or her presence, which could understate the impact since many states do not report details beyond that a distracted driver was involved in a crash); THOMAS A. RANNEY ET AL., NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., DISTRACTION EFFECTS OF MANUAL NUMBER AND TEXT ENTRY WHILE DRIVING 61 (2011), available at <http://www.distraction.gov/download/research-pdf/811510v508.pdf> ("Text messaging was associated with the highest level of distraction potential.").

driving is one thing; giving information to first responders quite another. The mere inability to articulate the relevant categories a priori dooms Kaplow's analysis rather obviously, but there is more. The mix of harms and benefits associated with each category of activity has to be reliably determined a priori.³⁵ This takes the analysis to absurdity. There is no way to collect information about the cost-benefit analysis of someone taking a short cut (and thus trespassing) on someone else's land, or how cell phone use compares to tweeting while driving. Taking short cuts creates both benefits and harms in incalculably different ways. There could not even be an "evidence threshold" of illegal dumping. Disposing of topsoil and dumping nuclear waste obviously pose different problems, and there is an infinite gradation between the two.

Remarkably, the impossibility of articulating the basic unit of analysis does not end the informational challenges facing the model. The evidentiary thresholds will not be static but dynamic. The second problem with Kaplow's model is his neglect of this theme of recent evidence and procedural scholarship that has focused on the dynamic nature of primary behavior and the complex interactions between primary and litigation behavior.³⁶ Kaplow notes the possibility of updating the thresholds, but still models the legal system and primary behavior as though they were static. Policymakers determine the thresholds, courts apply them, and people will have the incentives to behave optimally. But people will react to whatever policymakers decide. These reactions will have to be predicted in advance and the thresholds adjusted accordingly. Perhaps cell phone use in cars is suboptimal today and the punishments need to be increased. If that occurs, acts with both a positive and negative sum of harm and benefit may be deterred; not only the tweeting teenager but also a potential report of ongoing crime might not occur because of the increased sanction. But that demonstrates that the very act of affecting some category can change the mix, thus generating another cycle in determining the optimal social welfare rule. Thus, the first change must anticipate the second, ad infinitum.

This actually understates the problem. Once an evidence threshold is articulated, and a sanction imposed, the mere threat of the sanction presumably would affect some people's behavior; imposing the sanction in some case would affect others' behavior. Which is the correct threshold for the threshold? Or do you make a threat but carry out something else? If so, do you publicize that that is

35. States may allow defenses in cases involving some of the textual examples, but those are general and applied ex post, and thus are not inconsistent with the textual analysis. Individuals can always take the chance that someone will be forgiving of their actions. That is far different from identifying in advance all the relevant categories of those actions and applying a probabilistic measure to them.

36. See sources cited *supra* notes 2, 33.

what you are going to do or keep it secret? Again, differential effects will presumably obtain. It is unlikely to even be possible to obtain the information Kaplow's model demands, but if it is, the amount of information required would be literally beyond belief. In short, he is proposing an economic model with infinite transaction costs.

Undeterred by the impossibility of modeling even a single evidentiary device in a manner suitable for the real world, or by any apparent awareness of the primary or secondary literature on complexity and complex systems, Kaplow extends his analysis in the second article to the pretrial world. Here again he demonstrates a lack of knowledge of the pertinent literature that might have aided his analysis. He claims to be the first to have discovered that various pretrial procedural and evidentiary devices are united by the burden of proof, a point made first over thirty years ago³⁷ and extended in recent years by Michael Pardo to precisely the objects of Kaplow's analysis, such as directed verdicts and summary judgments.³⁸ Indeed, although again apparently not noticed by Kaplow, his "take everything into account" model was proposed a few years ago by the criminal law and torts scholars Larry Alexander and Kimberly Ferzan,³⁹ and critiqued for reasons analogous to those I am advancing here.⁴⁰ Similarly, the problematic relationship of standard microeconomic approaches to torts and what the legal system actually does was pointed out over a decade ago.⁴¹

In another demonstration of the risks of failing to attend to complexity, Kaplow demonstrates how his analysis of multistage litigation processes directly builds on his burden of proof analysis. At the first stage of litigation:

[W]e can ask how the decision to continue rather than to terminate influences social welfare. Most obviously, continuation results in both the actor and the system incurring adjudication costs. In addition,

37. Ronald J. Allen, *Presumptions in Civil Actions Reconsidered*, 66 IOWA L. REV. 843 (1981); Ronald J. Allen, *Structuring Jury Decisionmaking in Criminal Cases: A Unified Constitutional Approach to Evidentiary Devices*, 94 HARV. L. REV. 321 (1980).

38. Kaplow states that, "In all, it seems that dispositive motions in U.S. civil courts must be decided using rather ambiguous, open-ended criteria, where little guidance has been offered regarding what either test's actual content is—or what that content should be." Kaplow, *Multistage Adjudication*, *supra* note 28, at 1184–85 (footnote omitted). Similarly, he also asserts, "Neither courts nor commentators, however, have directed much attention to the competing factors that bear on when it makes sense to grant summary judgment." *Id.* at 1293. Michael Pardo has already thoroughly explored this precise issue. Michael S. Pardo, *Pleadings, Proof, and Judgment: A Unified Theory of Civil Litigation*, 51 B.C. L. REV. 1451 (2010).

39. LARRY ALEXANDER & KIMBERLY KESSLER FERZAN, *CRIME AND CULPABILITY: A THEORY OF CRIMINAL LAW* (2009).

40. Ronald J. Allen, *Modeling Criminal Law*, 29 LAW & PHIL. 469 (2010).

41. Ronald J. Allen & Ross M. Rosenberg, *Legal Phenomena, Knowledge, and Theory: A Cautionary Tale of Hedgehogs and Foxes*, 77 CHI.-KENT L. REV. 683 (2002).

relative to termination, continuation will augment the expected sanction associated with each type of act. The magnitude of each elevation will depend on the scenario, that is, on the information then available. If it is very favorable to liability, the contribution to the deterrence of harmful acts will be relatively great and to the chilling of benign acts rather small; conversely if the information is unfavorable. Moreover, as previously noted, the information will indicate the magnitude of actors' expected continuation costs, which may vary across scenarios. Moving back to the beginning, the point in time at which actors decide whether to act, a decision rule dictating continuation rather than termination in the scenario under consideration will increase the expected cost of committing the harmful act by some increment and the expected cost of committing the benign act by some other increment.

Continuation rather than termination will be optimal at stage one, in a given scenario, if and only if the following inequality holds:

$$\text{Deterrence Gain} > \text{Chilling Cost} + \text{Continuation Costs}$$

The benefit of continuation is that deterrence is enhanced, and there are two costs: the increase in chilling costs and in adjudication costs. Let us now decompose each of these components in turn.

Beginning with the first, we have:

$$\text{Deterrence Gain} = \text{Deterrence Effect} \times \text{Social Gain per Deterred Act}$$

That is, the benefit from enhanced deterrence is the product of the increase in deterrence—specifically, how many acts are deterred—and the net social gain per act that is deterred. Each of these two factors requires a further breakdown.⁴²

This is essentially the same analysis underlying the burden of proof rules with a few added complications (mostly transaction costs are added in). Thus it is also subject to the exact same critiques of impossible information demands and their exacerbation from the dynamic nature of society. Complexity piles upon complexity, however, because similar analysis must be done of the subsequent stages of litigation, and as Kaplow recognizes, their interaction with one another. As he helpfully puts it:

The formulations for optimal rules are complex, subtle, and in some respects surprising, but on reflection can readily be understood in terms of effects on the deterrence of harmful acts, the chilling of

42. Kaplow, *Multistage Adjudication*, *supra* note 28, at 1195–96 (footnotes omitted).

benign behavior, and the costs of operating the legal system. Unfortunately, case-specific informational challenges, institutional constraints, and limited systemic empirical knowledge, among other considerations, make it difficult to reason directly and simply from the analytical conclusions to rule interpretations or particular reforms. The present goal is to be informative and provocative, not definitive and prescriptive. It is impossible to make progress without first undertaking the sort of investigation attempted here. The effort reveals numerous insights and new perspectives on central features of legal system design as well as on current rules and practice that are absent in prior literature if for no other reason than that many of the relevant questions have not been asked.⁴³

It may very well be “impossible to make progress without first undertaking the sort of investigation attempted here,”⁴⁴ but the reason is that the analysis demonstrates the severe limits of this form of investigation. To make progress understanding the legal system or to intelligently recommend reforms will require the nuanced approach to complex systems latent in Yeazell’s work, supplemented with careful empirical inquiry. The sort of a priori reasoning on offer in this exhaustion of economic reasoning has the same chance of being useful as our physicist does of predicting the exact path of a molecule of water down the mountainside.

IV. EMBRACING COMPLEXITY

Recognizing the implications of complexity, by contrast, opens entirely new avenues for research. With regard to the future of litigation, it suggests that the question be viewed from the perspective of a vast and complex social process rather than from the perspective of a collection of legal rules. One must examine the thing itself cognizant of the unpredictable reactions that may occur when any particular part of the process is disturbed (like a thunderstorm over our mountain stream). This is why I think networks, equilibria, and empiricism will play increasingly large roles in the investigation of and prescriptions for the legal system.

They will play a role in other areas as well. For example, viewing the legal system as a complex dynamic system opens new perspectives on timeworn problems such as the Hart/Dworkin debate and in particular the implausibility of Dworkin’s concept of law as integrity. Dworkin has long argued for law as integrity and used Hercules as a metaphor for how that might be accomplished. The

43. *Id.* at 1192 (footnote omitted).

44. *Id.*

examples of law given by Dworkin, presumably as indicative of the set to be explained, are things like whether a person who kills his benefactor may recover under a will, whether a dam could not be finished because of risk to the snail darter, the limits on recovery for emotional harm, and whether the U.S. Constitution forbids segregated public schools.⁴⁵ Dworkin spends considerable effort to explain how Hercules would answer such questions, starting with a set of plausible principles and determining their consistency with other parts of the legal system, but his demonstration elides impossible questions of knowledge acquisition.

Hercules “begins by setting out various candidates for the best interpretation of the precedent cases even before he reads them,” but how does he have any idea of the candidates for best interpretation of cases he has not read?⁴⁶ Precedents are determined by their facts, so at some point he must consider all of the facts of relevant precedents and make judgments about the relative importance of widely varying facts to outcomes. This would not only require reading them but accounting for a huge set of facts. The knowledge demands get worse. At the end of the day, law as integrity involves the entire legal system: “Law as integrity, then, requires a judge to test his interpretation of any part of the great network of political structures and decisions of his community by asking whether it could form a part of a coherent theory justifying the network as a whole.”⁴⁷

Perhaps anticipating the looming problems of complexity and computational intractability, Hercules can cut off inquiry but not for any reason consistent with the demands of integrity. For example, as Hercules struggles with damages, he might find a split of opinion, and thus “[h]e might expand his field of survey still further, and the picture might change if he does. But let us suppose he is satisfied that it will not.”⁴⁸ We can suppose that, but how does Hercules know that? Is it based on the fit of this particular inquiry with others? That seems peculiar, but in any event involves yet another heroic epistemological enterprise, as well as equally heroic assumptions about the reliability of induction in this particular setting. So, it seems like Hercules cannot be satisfied within the confines of law as integrity and must press on.

But we do not need to press on, for the point is now obvious. Hercules has not just a difficult task; as Dworkin says, “No actual judge could compose anything approaching a full interpretation of all of his community’s law at once. That is why we are imagining a Herculean judge of superhuman talents and

45. RONALD DWORKIN, *LAW’S EMPIRE* 15–30 (1986).

46. *Id.* at 240. In real life, the answer is the parties tell him, which makes a lot of sense but is not law as integrity. In the Dworkinian world, the judge imposes his value judgments on others, apparently.

47. *Id.* at 245.

48. *Id.* at 248.

endless time. But an actual judge can imitate Hercules in a limited way.⁴⁹ No, he cannot. In fact, even Hercules cannot imitate Hercules, at least not in any sense that would make the activity attractive as a model for decisionmaking. It is rather obvious that Hercules has thousands—actually hundreds of thousands—of variables to keep track of. Even if cases could be reduced to simple propositions, it would take a number of such propositions to represent a typical case (X is true unless Y or Z , in which case A , and so on). In each of the legal systems in the United States, there are thousands, and probably hundreds of thousands, of cases. Nor can Hercules ignore the vast outpouring of statutory material if he is going to model the actual legal system. This raises the specter of computational intractability.

Hercules seeks to establish the truth of a legal proposition by analyzing its relationship to every other legal norm expressed in prior precedents. If there is one right answer for every given set of inputs, then there must be some articulable process by which one can go from inputs to the correct result. It appears that Hercules effectively treats each past decision as a variable that the truth value of every other legal proposition is dependent upon. The simplest test of consistency to test the logical relationships among the propositions characterizing the legal precedents is through a truth table. This is an algorithmic device that facilitates the comparison of propositions and their use over different operations.⁵⁰ But such an effort would be futile, even for a jurist of truly Herculean intellect. A truth table in a system of basic predicate logic grows exponentially as the number of variables increases. For example, a truth table with 300 input variables would require something on the order of 10^{100} lines. Now, consider what this means:

Assuming the universe is between 10^{10} and 10^{11} years old, a computer that could make a check every picosecond (10^{-12} second) and that had been checking continuously since the instant of the big bang would by now have made roughly 10^{30} checks, which is such a small fraction of 10^{100} that if it were subtracted from 10^{100} , there would be approximately 10^{100} left. In other words the progress made by our imaginary supercomputer toward its goal would be so small relative to the magnitude of the task that one would be justified in saying it had hardly begun.⁵¹

49. *Id.* at 245.

50. *Understanding Truth Tables*, INTERNETLOGIC.ORG, <http://www.internetlogic.org/ttest2.html> (last visited July 8, 2013).

51. RAYMOND S. NICKERSON, ASPECTS OF RATIONALITY: REFLECTIONS ON WHAT IT MEANS TO BE RATIONAL AND WHETHER WE ARE 61 (2008). These kinds of demonstrations owe their inspiration to Christopher Cherniak. *See* CHRISTOPHER CHERNIAK, MINIMAL RATIONALITY 90–91, 142 nn. 9–10 (1986). The pertinent calculations are in the footnotes.

Size is a problem, too, in two different ways:

[I]f a sphere 100 billion light years in diameter (considerably larger than the known universe) were tightly packed with proton-sized (10^{-15} meter) computers, each capable of checking for a contradiction in 10^{-23} second (roughly the time required for light to travel a distance equal to a proton's diameter), and the resulting machine were to run non-stop at full tilt for a 100 billion years or so, it could make on the order of 10^{168} checks, which would be enough to ensure the logical consistency of about 558 beliefs.⁵²

Or suppose one wanted to use some other approach, such as deriving proofs in Boolean logic. "To prove theorems of only 617 symbols or fewer would require a network with so many Boolean elements that, even if each were the size of a proton (with infinitely thin interconnecting wires), the machine would exceed the volume of the entire known universe."⁵³ Consider the case of the consistency of just Supreme Court cases. If there are on average about 100 such cases a year, then there would be approximately 23,000 of them now.⁵⁴ And the matter is more complicated still because some of the propositions that would characterize cases are continuous rather than discrete (for example, "what is the risk to life?").

Hercules must deal with another aspect of logical consistency: Each time a new proposition is added, the process of determining consistency in a sense has to begin all over again. Any particular proposition may be consistent with one or more other propositions when judged alone, but inconsistent with them when judged together. Consider for example the proposition "all A are B." This is consistent with "all C are A." It is also consistent with "no C are B." However, "all A are B" is not consistent with the latter two propositions, as they imply that "some A are not B." To make this concrete (all A are B): "All law professors are Dworkian godlike creatures." This is consistent with (all C are A): "All economics professors with appointments in law schools are law professors." It is also consistent with (no C are B): "No economics professors with appointments in law schools are Dworkian godlike creatures." The consistency of the first proposition with each of the second two is obvious: The third proposition could mean that economics professors with appointments in law schools are not law

52. NICKERSON, *supra* note 51, at 61. Nickerson is referring to the work of Stockmeyer and Meyer discussed in WILLIAM POUNDSTONE, PRISONER'S DILEMMA: JOHN VON NEUMANN, GAME THEORY, AND THE PUZZLE OF THE BOMB 183 (1992).

53. CHERNIAK, *supra* note 51, at 90.

54. There were 11,008 Supreme Court cases disposed of by signed opinion from 1926 to 2004. LEE EPSTEIN ET AL., THE SUPREME COURT COMPENDIUM: DATA, DECISIONS, AND DEVELOPMENTS 80–81 (4th ed. 2007). Apparently the data prior to 1926 is not available. *Id.* at 81 note a.

professors. The second two standing alone are also consistent; they imply that some law professors are not Dworkian godlike creatures. And the inconsistency of the first with the second and third propositions is again obvious. Each new proposition added to the total propositions of the legal system requires a global reconsideration of consistency relationship.

Dworkin's proponents and Kaplow might complain that I have failed to notice that their tasks are normative, whereas mine is empirical. Still, ought should imply can, and if it does not, the effort is uninformative for the real world.⁵⁵ In any event, in normative or positive work, complexity looms as a daunting problem, and it does no good to ignore it even if that means that often the best that one can do is muddle through. Merely muddling through may be preferable to looking under the lamppost for the keys because that is where the light is.

V. MUDDLING THROUGH WITH NETWORKS

Let me say a few, again allusive rather than definitive, words about what muddling through may involve that provide a brief elaboration of my earlier references to networks. The model is quite simple but potentially highly explanatory. The law is not a set of discrete rules or rulings but instead the byproduct of a complex adaptive system. Each case adjudicated, regulation issued, or statute passed functions as input to a node in a network of distributed processors.⁵⁶ Each node processes discrete problems, taking account of inputs from the participants in the unfolding event (a case being tried, a statute being passed). Whatever happens sends signals out across the network. Every single decided case can be accessed by millions of people, each of whom is a node in this system and has connections to others; new legislation is immediately put on the Web (as an example of modern communication, but the model does not depend on the internet), and so on. Anyone affected adversely or positively by a new input to the field can react to it. If a case in California has the capacity to do mischief in New York, people will take note and act accordingly, and so on. This facilitates new inputs into the system in the next case that comes along. This distributed processing functions to craft the law, and it is fundamentally bottom-up, not top-down. It is not static, but dynamic, and constantly subject to modification in the

55. Ronald J. Allen & Brian Leiter, *Naturalized Epistemology and the Law of Evidence*, 87 VA. L. REV. 1491 (2001).

56. My thinking of the legal system as a network thus far is informed more by things like neural than social networks, but this work is at an early stage.

light of new inputs. It is not a set of discrete decisions involving the search for the right answers but instead a complex system adapting to whatever inputs occur.

Prior accounts of the legal system have generally attempted to express a theory of law by identifying the criteria of law. They ask why certain rules or principles or norms are law and others are not. For Hart, rules are law when they are identifiable by the social facts constituting the rule of recognition (Hart's analysis can probably be extended to accommodate what follows). For Dworkin, although historical facts play a role in determining which norms constitute law, content is more important. The law consists of those principles that are consistent with integrity and justice. The answer provided here is much simpler and more elegant: The law is the byproduct of the operation of the web of the legal system, and the legal system in turn is any effort to regulate the actions of others. The appropriate inputs into this system are a priori unconstrained for the most part. The complex relationships between institutions, individuals, and rules determine which inputs are given what weight in which situations. However, whatever happens is immediately broadcast to the web as a whole, and reactions set in. Thus, what appears to be a recipe for chaos is actually an explanation as to why the system appears relatively stable yet is constantly changing at the same time. It is relatively stable because everyone is watching everyone, so to speak, and can react instantaneously to what is observed; it is constantly changing because everyone has different views of problems and can bring to bear unconsidered issues and perspectives that have their own consequences for disturbing the web.

Judges adjudicate largely by approaching each legal decision by examining what the parties present and the relative plausibility of each potential view of the law that is presented in a given situation. Rather than searching for the one right answer to the question at hand, the process is open ended, in which the most plausible theory of the law will be accepted only until a better one is suggested. To some extent, this is a generalization of work in evidence exploring the nature of juridical proof as one in which decisionmakers choose the best overall explanation from a range of plausible alternatives rather than making probabilistic appraisals of the truth of discrete propositions.⁵⁷ “[T]his shift mirrors an analogous shift in the philosophy of science earlier this century from the view that science is embarked on an inexorable march toward the truth to the view that progress is measured by the articulation of better theories, where ‘better theories’ means ‘better than the available alternatives.’”⁵⁸ This process of observation and

57. Allen, *Factual Ambiguity*, *supra* note 33.

58. *Id.* at 605.

generalization to form beliefs through a comparative process is true both at the level of individual and scientific knowledge. We ask which theory explains our observations best, as compared to the available alternatives.⁵⁹

Legal actors make decisions about what the law is in the same way that humans make other judgments, by comparing potential explanations and choosing the one that is comparatively more plausible than the alternatives. Decisions about the law and other social rules are complex ones influenced by a wide variety of pressures and inputs. The set of inputs that can be considered in legal decisionmaking is limited only by the creativity of the parties to a dispute and the individual beliefs of the judge.

All of this leaves open the question of what makes one inference better than another. Some might think this is purely a conceptual question. One should, however, actually look at the legal system to get clues from its actual operation. The legal system is best described in almost the opposite terms that Dworkin would invoke. Rather than being one big search for consistency, it is a halting and fitful progression toward stability, in which stability is measured in terms of the excitations of its nodes. The more participants in the legal system are excited about any particular issue, the less stable it is. In general, the system moves toward minimizing excitations by reaching equilibria that are generally acceptable. This explains, for example, why the Supreme Court usually retreats in the face of sustained discontent with its rulings.⁶⁰

Consistency is a futile aspiration no matter how conceptually attractive it might be, which in part explains why, with due deference to Dworkin, no competent empirical inquiry into the operation of the legal system would conclude that consistency writ large is among its most fundamental principles. Dworkin gives a few examples of decisions and what people think they are doing in arguing for or making those decisions, and from this he draws the inference that these examples are constitutive or at least are suggestive of what the law is.⁶¹ I know that Dworkin's efforts are largely conceptual, but still this is empiricism of the most peculiar sort (quite apart from whether he picked his examples well)⁶² and

59. The classic article on inference to the best explanation is Gilbert H. Harman, *The Inference to the Best Explanation*, 74 PHIL. REV. 88 (1965). See also Allen, *Factual Ambiguity*, *supra* note 33; Pardo & Allen, *supra* note 33.

60. See, e.g., GERALD N. ROSENBERG, *THE HOLLOW HOPE: CAN COURTS BRING ABOUT SOCIAL CHANGE?* (2d ed. 1991).

61. DWORKIN, *supra* note 45, at 15–44.

62. For example, the reception of American courts to emotional harm, one of his examples is, to say the least, complicated. See, e.g., M. Lee Huffaker, Comment, *Recovery for Infliction of Emotional Distress: A Comment on the Mental Anguish Accompanying Such a Claim in Alabama*, 52 ALA. L. REV. 1003 (2001).

highlights the most attractive of Yeazell's more careful empirical and doctrinal efforts.⁶³ Any serious empirical study of judicial decisionmaking in the United States that did not start with a few hand-picked examples would demonstrate that the criteria for these decisions are diverse and situation dependent and that those criteria are not captured by any top-down requirement that they comply with some theory of integrity. Consistency of various kinds is surely a variable, but at the same time the law in the United States is filled with courts telling petitioners that the illogical they see in the law is someone else's problem rather than the court's and that apparent inconsistencies within the law are not a pressing problem. And this is true at both the lowest and the highest levels of adjudication.

For example, the inconsistencies between torts and contracts have long been known but have not been the subject of great consternation,⁶⁴ and the phenomenon of courts punting illogical and even rather absurd laws to the legislature for resolutions is ubiquitous in the United States.⁶⁵ The disinclination to worry about logical consistency or law as integrity is also evident in the one court that might be thought receptive to such arguments, the U.S. Supreme Court. Notwithstanding all of Dworkin's browbeating of the Supreme Court over the years, the Supreme Court's cases are known not for being exemplars of Dworkinian-like reasoning but for being the exact opposite, and not just in condoning legislative

63. DWORKIN, *supra* note 45, at 11–44.

64. See, e.g., Thomas C. Galligan, Jr., *Contortions Along the Boundary Between Contracts and Torts*, 69 TULSA L. REV. 457, 462–74 (1994) (describing the six instances in which contract and tort law diverge on similar ideas).

65. Perhaps the point was most succinctly made in Justice Stevens' pithy concurrence in *New York State Board of Elections v. López Torres*, 552 U.S. 196, 209 (2008) (Stevens, J., concurring):

While I join Justice Scalia's cogent resolution of the constitutional issues raised by this case, I think it appropriate to emphasize the distinction between constitutionality and wise policy. Our holding with respect to the former should not be misread as endorsement of the electoral system under review, or disagreement with the findings of the District Court that describe glaring deficiencies in that system and even lend support to the broader proposition that the very practice of electing judges is unwise. But as I recall my esteemed former colleague, Thurgood Marshall, remarking on numerous occasions: "The Constitution does not prohibit legislatures from enacting stupid laws."

See also *Lamie v. U.S. Trustee*, 540 U.S. 526, 534, 542 (2004) (upholding an "awkward, and even ungrammatical" statute because "[i]t is beyond our province to rescue Congress from its drafting errors, and to provide for what we might think . . . is the preferred result" (second alteration in original) (quoting *United States v. Granderson*, 511 U.S. 39, 68 (1994) (Kennedy, J., concurring)) (internal quotation marks omitted)); *In re Miller*, 570 F.3d 633, 639 (5th Cir. 2009) ("[P]erceived poor drafting should not be regarded as a license to invalidate plain-text readings in the name of fixing a statute that some believe is broken.").

stupidity.⁶⁶ Two cases from constitutional criminal procedure make this point dramatically. In *Doe*⁶⁷ and *Braswell*,⁶⁸ the Supreme Court was faced with the obvious fact that there is no pertinent difference between a privately held business that is not a corporation and a solely owned corporation and thus that the Fifth Amendment should apply the same to both. The Supreme Court gave the argument the back of its hand, brushing off functional equivalence as not pertinent and relying instead on legal categories rather than law as integrity.⁶⁹

The examples could be multiplied endlessly. Indeed, the best explanation of Fourth Amendment jurisprudence is a set comprising local knowledge with no overarching theoretical explanations.⁷⁰ William Stuntz, in his review of the entire field of criminal law and procedure, sums up the general state of affairs with his comment on the judicial exegeses on the Confrontation Clause: “The confrontation clause does not aim to promote the use of reliable evidence. Rather, its point is to promote confrontation—and the clause rests on no theory of why confrontation advances any rational policy goal.”⁷¹ Stuntz sums up the larger lesson of which the Confrontation Clause is a small part in a devastating critique of at least this law as integrity: “This is the natural consequence of anchoring the nation’s criminal justice system to a set of procedures defined by eighteenth-century English law—procedures whose rationales have been largely lost in time—not by the system’s contemporary needs and capacities.”⁷²

66. Dworkin, and others, instructed the Court directly through briefs in *Vacco v. Quill*, 521 U.S. 793 (1997), and *Washington v. Glucksberg*, 521 U.S. 702 (1997), in which the Court held that state bans on assisted suicide do not violate the Fourteenth Amendment. The cream of the American philosophical crop (along with Dworkin, Thomas Nagel, Robert Nozick, John Rawls, Thomas Scanlon, and Judith Jarvis Thomson) wrote an amicus brief to the contrary, which the Court did not even mention in reaching its unanimously opposite conclusion.

67. *United States v. Doe*, 465 U.S. 605 (1984).

68. *Braswell v. United States*, 487 U.S. 99 (1988).

69. *Id.* at 104 (“Had petitioner conducted his business as a sole proprietorship, Doe would require that he be provided the opportunity to show that his act of production would entail testimonial self-incrimination. But petitioner has operated his business through the corporate form, and we have long recognized that, for purposes of the Fifth Amendment, corporations and other collective entities are treated differently from individuals. This doctrine—known as the collective entity rule—has a lengthy and distinguished pedigree.”).

70. Ronald J. Allen & Ross M. Rosenberg, *The Fourth Amendment and the Limits of Theory: Local Versus General Theoretical Knowledge*, 72 ST. JOHN’S L. REV. 1149 (1998).

71. WILLIAM J. STUNTZ, *THE COLLAPSE OF AMERICAN CRIMINAL JUSTICE* 227 (2011). Stuntz comments on a variety of Supreme Court cases. *See id.* at 172 (“The requirement that Congress restrict criminal statutes’ scope to foreign and interstate commerce was formal, not functional.”); *id.* at 176 (“Form, not substance, controlled.”); *id.* at 225 (“*Mapp* was designed not to advance some vision of the law of police evidence-gathering but simply to enforce the relevant rules—regardless of those rules’ rationales.”).

72. *Id.* at 227.

CONCLUSION

Empiricism and careful analysis of actually existing states of affairs may play no role in Dworkin's conceptual scheme, but that may explain why that conceptual scheme has exerted essentially no influence over the development of the law in the United States.⁷³ This takes us back to what *The Future of Litigation* might be. To end where I began, I really do not know. I have a very good idea how it will evolve, however, and that is as a complex adaptive system. In observing and directing that evolution, rule-based methodologies similar to those of our apocryphal physicist, as well as Dworkin's law as integrity and Kaplow's work on procedure will certainly have their place, but so too will methodologies that respect the complexity of the phenomena under investigation, such as Yeazell's. I will go further and suggest that with regard to discovery of knowledge, Yeazell's approach will dominate the future, even if that then newly discovered knowledge is subsequently ordered and explained in a conventional fashion.

73. Ronald J. Allen, *Two Aspects of Law and Theory*, 37 SAN DIEGO L. REV. 743 (2000).