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Thinking of Mediation As a Complex Adaptive System

*J. B. Ruhl**

I. INTRODUCTION

To shed light on the source and nature of law, matters of intense debate in legal philosophy for centuries, Professor Lon Fuller asked his readers to imagine a society of shipwrecked, amnesiac sailors.¹ What would law mean to them? he asked, and how would it be laid down? Given the traditional focus of legal philosophy on the nature of the sovereign, the role of common law courts, and the function of legislatures,² it was reasonable for Fuller to direct his answers toward the importance the hapless sailors would place on the selection of judges³ and the methods the judges would use to decide questions and disputes arising in the social context.⁴ But in so doing, Fuller implied that it would never have occurred to the sailors to devise a system of dispute resolution that relied on no judges at all.⁵ In other

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1. See Lon L. Fuller, *Reason and Fiat in Case Law*, 59 HARV. L. REV. 377-78 (1946).

2. For a description of the dominant role these themes played in legal theory during the first half of the twentieth century, see NEIL DUXBURY, *PATTERNS OF AMERICAN JURISPRUDENCE* 9-135 (1995).

3. Fuller explained that "the man chosen for this office is sane and reasonably intelligent, and . . . he feels a sense of responsibility for advancing the prosperity of the group and preserving its morale." Fuller, *supra* note 1, at 378.

4. Fuller contended that "the judge functions not as one who seeks to conform his will to an external order, but as one whose will itself creates the order to which men must conform." *Id.* at 378-79.

5. Fuller explained that "[d]isputes arise among the members of the group and it is seen that some means must be provided for their settlement," but then moved directly to the assumption that "[a]ccordingly, one of the company is designated as

words, Fuller presented it as a given that the sailor society would naturally evolve toward a dispute resolution system that had as its central mechanism the adjudicative model that predominated at the time and continues to predominate in the United States today.⁶

If Fuller's sailors truly were amnesiac, however, they would have no predisposition toward any particular model of dispute resolution and thus would not view the adjudicative model as "normal" and nonadjudicative models⁷ as "alternative dispute resolution" (ADR). Let us imagine, therefore, that they remained stranded on their island for many generations (it was a co-ed ship), all the while (owing to their cooperative disposition) without ever having had the need to devise a social system for resolving disputes over the application of the few rules of "law" they had found necessary to establish over the years. In the past few months, however, disputes over farming rights, consumer goods, family matters, and similar civil issues⁸ have simmered without resolution through the normal process of unstructured, unfacilitated, voluntary, one-on-one negotiation that has served them until now. Fortunately, several crates of laptop computers and cellular phones have washed up on the island's shores in recent years, and the islanders are now fully "on-line." They e-

arbitrator or judge." *Id.* at 377-78. To be fair, Fuller's account of the sailor society was not intended to explore the merits of mediation versus adjudication, but rather to respond to some of the positivist legal commentary of the day that espoused a complete separation of law and morality. *See id.* at 381-95. Professor Fuller was indeed an early, perceptive, and influential advocate of the qualities of mediation. *See* Lon L. Fuller, *Mediation—Its Forms and Functions*, 44 S. CAL. L. REV. 305 (1971) [hereinafter *Mediation*]; Lon L. Fuller, *The Forms and Limits of Adjudication*, 92 HARV. L. REV. 353 (1978). *See generally* Robert G. Bone, *Lon Fuller's Theory of Adjudication and the False Dichotomy Between Dispute Resolution and Public Law Models of Litigation*, 75 B.U. L. REV. 1273 (1995).

6. Adjudication is "a dispute resolving process in which parties present their factual dispute to a third party who has the power to make a decision that is binding on the parties." ROBERT S. MITCHELL & SCOTT E. DEWHIRST, *THE MEDIATOR HANDBOOK: A TRAINING GUIDE TO MEDIATION TECHNIQUES AND SKILLS* 3 (1990). Forms of adjudication are generally thought to include court tribunals, administrative tribunals, and arbitration, each of which involves the use of a third party decision maker with coercive powers. *See* Frank E. A. Sander, *Varieties of Dispute Processing*, 70 F.R.D. 111, 115 (1976).

7. The nonadjudicative models, or ADR, include mediation, ombudsman fact-finding, unfacilitated negotiation, internal tribunals, and avoidance. *See* Sander, *supra* note 6, at 114-18; Gerald R. Williams, *Negotiation as a Healing Process*, 1996 J. DISP. RESOL. 1.

8. My focus on civil dispute resolution requires that we pretend the islanders still have no crime in their peaceful utopia.

mail you for advice on how to design their civil dispute resolution system.⁹

The island society is not entirely unsophisticated in these matters, however, and has specified certain qualities they want the dispute resolution system to satisfy. Their list of conditions is as follows:

1. The dispute resolution system must be sufficiently flexible to address all types of civil disputes that might arise between island inhabitants;
2. The dispute resolution system must ensure that all persons who have an interest in a dispute are able to be heard;
3. The dispute resolution system must be capable of fashioning outcomes that are lasting in effect; and
4. The dispute resolution system should disrupt the relationships of the parties involved only to the degree desired by the parties or otherwise necessary to effectuate justice.

9. My purpose in using this make-believe setting is to force the analysis of dispute resolution systems out of the preexisting adversarial consciousness and culture that leads most evaluations of mediation and other forms of assisted negotiation to present them as the alternatives to adjudication. One of the problems the institutionalization of mediation has faced is that it and other ADR models have been portrayed as either facilitating or obfuscating adjudication and have thus been evaluated primarily on those terms. See, e.g., Kim Dayton, *The Myth of Alternative Dispute Resolution in the Federal Courts*, 76 IOWA L. REV. 889 (1991) (describing the alleged benefits of ADR as "illusory" based principally on quantitative measurements of the degree to which ADR has been successful as a court management tool); Carrie Menkel-Meadow, *Pursuing Settlement in an Adversary Culture: A Tale of Innovation Co-Opted or "The Law of ADR,"* 19 FLA. ST. U. L. REV. 1 (1991) (reviewing "the conflicting impulses and purposes behind the ADR movement"). The islanders, by contrast, have no preexisting consciousness or culture to distort their evaluation of any particular model. Nor, for that matter, do the islanders have preexisting institutions such as courts, judges, lawyers, contingent fees, and other accouterments of the adjudication system that bias evaluation of mediation and other ADR models because of the fear of deinstitutionalization. See John Blackman, *Alternative Dispute Resolution and the Future of Lawyering*, 23 LINCOLN L. REV. 1 (1995). Commentators have pointed out that such fears are largely unfounded, for if anything, the manner in which the United States has embraced ADR appears to be expanding the domains of courts and attorneys. See Robert A. Baruch Bush, *Alternative Futures: Imagining How ADR May Affect the Court System in Coming Decades*, 15 REV. LITIG. 455 (1996) (examining the possible roles for courts); Suzanne J. Schmitz, *Using ADR for Your Client: An Illinois Lawyer's Guide*, 85 ILL. B.J. 64 (1997) (examining the roles for attorneys).

Though you might not have expressed the same desired conditions, the islanders' list probably would not strike you as unreasonable.¹⁰ Their conditions express the kind of flexibility, inclusiveness, duration, and sensitivity to human relations that any society might hope of its legal system. But what may strike you as unusual about the conditions is the absence of any reference to laws, judges, rules of procedure, or other mechanics of the dispute resolution system. In this sense the conditions are stated as *performance standards*, not as *structural qualities*.¹¹ They do not presuppose what Fuller's story did—that the island society would naturally adopt a system structured around the model of litigation and judicial resolution. The islanders have asked you to throw away that assumption in order to advise them about the underlying structure of the dispute resolution system with the performance-based criteria of their work order in mind.

One of the difficulties you will face in fulfilling their request is that the islanders have no particular reference point or "baseline"¹² from which you can work to explain the comparative qualities of different dispute resolution system models. More to the point, you cannot explain what we call ADR models by comparing them to the islanders' preexisting adjudicative model con-

10. Before you object to any of these conditions as not representing a desirable goal of dispute resolution, ask whether your objection is a reflection of a preexisting, possibly unintentional bias in favor of adjudication. For example, an experienced litigator might ask how "interest" in the second condition is defined, and how will persons who allege an interest establish it as sufficient to permit them to be involved in the proceeding notwithstanding the objection of other parties? Those questions, however, are laden with terms associated intimately with the structural context of adjudication—define, allege, establish, object. The point of the islanders' story is to force us out of that context in order to evaluate dispute resolution models without preexisting biases.

11. I will take this distinction a step further to illustrate that the performance standards the islanders have issued focus on the qualitative aspects of dispute resolution rather than quantitative standards such as efficiency and cost. The qualitative/quantitative performance distinction and, more particularly, which set of standards should predominate in policy decisions about institutionalization of dispute resolution models has been an important focus of literature on dispute resolution systems. See, e.g., Menkel-Meadow, *supra* note 9, at 6-8. However, my focus is exclusively on the qualitative factors. Assume with me, if you will, that the islanders are interested principally in quality and are willing to pay extra and take more time to get it. For a thorough comparative evaluation of the various forms of ADR on largely quantitative bases, see Lynn A. Kerbeshian, *ADR: To Be Or . . . ?*, 70 N.D. L. REV. 381 (1994).

12. See Menkel-Meadow, *supra* note 9, at 7 n.25 (discussing the use by many scholars of adjudicative results as the baseline for evaluating negotiated results).

sciousness, because they have no such consciousness. For the islanders, in other words, ADR is not a relevant concept, and thus you must build each model you propose for their consideration from the ground up in order for them to fully appreciate and evaluate its merits. To be fair to all the models, therefore, you also must establish a common benchmark—one which contains no normative bias for or against any of the possible models and against which each can be measured so that all can be objectively compared.

In your quest for a common measurement criterion, you might make an association between the islanders' performance-based criteria and the concepts of complexity and complex adaptive systems which have emerged in recent scientific and organizational research literature.¹³ Complex adaptive systems combine qualities of coherent stability and disordered change to produce sustaining, adaptive performance over the long run.¹⁴ Four important features of complex adaptive systems explain how they are able to balance stability and change to produce this outcome. First, they perform according to complex, large-scale behaviors that emerge from the aggregate interactions of less complex agents, such as how the trends of macroeconomic scale represent the aggregate behavior of many individual firms or investors.¹⁵ Second, the interactions of the system exhibit unpredictable, nonlinear relationships incapable of being neatly plotted as straight-line formulae, as revealed in the complex dynam-

13. Complexity theory refers to the body of literature and research devoted to "the study of the behavior of macroscopic collections of [interacting] units that are endowed with the potential to evolve in time." PETER COVENEY & ROGER HIGHFIELD, *FRONTIERS OF COMPLEXITY: THE SEARCH FOR ORDER IN A CHAOTIC WORLD* 7 (1995). Although the study of such systems can be quite technical in substance, many of the recent and most influential works in the field focus on applications of the technical theory to real world phenomena, such as biological evolution. See, e.g., JOHN L. CASTI, *COMPLEXIFICATION: EXPLAINING THE PARADOXICAL WORLD THROUGH THE SCIENCE OF SURPRISE* (1994); JACK COHEN & IAN STEWART, *THE COLLAPSE OF CHAOS: DISCOVERING SIMPLICITY IN A COMPLEX WORLD* (1994); *COMPLEXITY: METAPHORS, MODELS, AND REALITY* (George Cowan et al. eds., 1994) [hereinafter *COMPLEXITY METAPHORS*]; MURRAY GELL-MANN, *THE QUARK AND THE JAGUAR: ADVENTURES IN THE SIMPLE AND THE COMPLEX* (1994); BRIAN GOODWIN, *HOW THE LEOPARD CHANGED ITS SPOTS: THE EVOLUTION OF COMPLEXITY* (1996); JOHN H. HOLLAND, *HIDDEN ORDER: HOW ADAPTATION BUILDS COMPLEXITY* (1995); STUART KAUFFMAN, *AT HOME IN THE UNIVERSE: THE SEARCH FOR LAWS OF SELF-ORGANIZATION AND COMPLEXITY* (1995); KEVIN KELLY, *OUT OF CONTROL: THE RISE OF NEO-BIOLOGICAL CIVILIZATION* (1994).

14. See HOLLAND, *supra* note 13, at 4.

15. See *id.* at 11.

ics of many predator-prey populations.¹⁶ Third, the complex adaptive system can be described through the varied flows of its mediums—fluids, money, energy, information, and so on—just as the weather reporter traces the jet stream to describe the storm patterns.¹⁷ Fourth, complex adaptive systems are defined by their diverse ingredients and context, as a biologist might describe the diverse species in an ecosystem.¹⁸ Not surprisingly, after almost two decades of developing the model of complex adaptive systems,¹⁹ researchers believe these systems are found throughout nature—in ecosystems, earthquakes, genetics, evolution, and the weather, for example—and throughout human organizational behavior—in economic activity and technological development, for example.²⁰ Indeed, several commentators have posited that the sociolegal system in general exhibits the qualities of a complex adaptive system.²¹

16. *See id.* at 15-23.

17. *See id.* at 23-27.

18. *See id.* at 27-31.

19. For histories of the development of complexity theory, which has been brought about largely through the efforts of the Santa Fe Institute, see JAMES GLEIK, *CHAOS* (1987), ROGER LEWIN, *COMPLEXITY: LIFE AT THE EDGE OF CHAOS* (1992), and M. MICHAEL WALDROP, *COMPLEXITY: THE EMERGING SCIENCE AT THE EDGE OF ORDER AND CHAOS* (1992). Current information about the field is best obtained from the journal *COMPLEXITY*.

20. *See, e.g.*, PER BAK, *HOW NATURE WORKS: THE SCIENCE OF SELF-ORGANIZED CRITICALITY* (1996) (discussing the evidence of complex adaptive behavior in sandpiles, biological evolution, ecosystems, earthquakes, brain functions, traffic jams, and economics). The underlying premise of complexity theory is that "similar patterns of activity can arise in systems that differ greatly from one another in their composition and in the nature of their parts They all show similar types of dynamic activity—rhythms, waves that propagate in concentric circles or spirals that annihilate when they collide, and chaotic behavior." GOODWIN, *supra* note 13, at 77.

21. Elsewhere, I have laid out the basic model of how the sociolegal system can be portrayed as a complex adaptive system and how the findings of complexity theory can contribute to an understanding of the mechanics of how that system behaves and evolves. *See* J. B. Ruhl, *Complexity Theory as a Paradigm for the Dynamical Law-and-Society System: A Wake-Up Call for Legal Reductionism and the Modern Administrative State*, 45 *DUKE L.J.* 849 (1996) (general behavioral model); 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 (1996) (general evolutionary model); J. B. Ruhl & Harold J. Ruhl, Jr., *The Arrow of the Law in Complex Administrative States: Using Complexity Theory to Reveal the Diminishing Returns and Increased Risk the Burgeoning of Law Poses to Modern Society*, 30 *U.C. DAVIS L. REV.* 405 (1977) (discussing the direction in which the behavioral and evolutionary mechanics are leading the sociolegal system given its current transient state). There are additional descriptions of how complexity theory or branches of it help explain how law behaves and evolves generally. *See, e.g.*, Gerald Andrews Emison, *The Potential for Unconventional Progress: Complex Adaptive Systems and Environmental Quality Policy*, 7 *DUKE ENVTL. L. & POL'Y F.* 167 (1997) (discussing use of complexity theory in

In essence, the islanders have asked you to design their dispute resolution system as a complex adaptive system. They seek the flexibility, inclusiveness, duration, and sensitivity inherent in the sustainability and adaptability of complex adaptive systems. Through what structure of dispute resolution system can you deliver what the islanders want? Does the adjudicative model that predominates in the American dispute resolution system fulfill that promise? If so, fax them the Federal Rules of Civil Procedure and your job is done. But, do you normally use the terms flexible, inclusive, lasting, and sensitive when describing that model? Probably not. So, perhaps you will want to go back to the drawing board.

It is with that task in mind that I offer these observations on mediation as a complex adaptive system. In Part II of this Article, I explore the degree to which the mediation model fits the four properties of complex adaptive systems and compare one form of ADR, mediation,²² to the litigation model in that respect.

environmental law); Thomas Earl Geu, *The Tao of Jurisprudence: Chaos, Brain Science, Synchronicity, and Law*, 61 TENN. L. REV. 933 (1994) (discussing the potential significance of chaos and emergence to legal theory); Andrew W. Hayes, *An Introduction to Chaos and the Law*, 60 UMKC L. REV. 751 (1992) (general discussion of chaos theory and its application to judicial decision making); Vincent Di Lorenzo, *Legislative Chaos: An Exploratory Study*, 12 YALE L. & POL'Y REV. 425 (1994) (developing a model for legislative decision making based on chaos theory); Mark J. Roe, *Chaos and Evolution in Law and Economics*, 109 HARV. L. REV. 641 (1996); Robert E. Scott, *Chaos Theory and the Justice Paradox*, 35 WM. & MARY L. REV. 329 (1993) (applying chaos theory to the legal dilemma between "present justice" and "future justice"). Several other works discuss complexity theory or its branches, sometimes very briefly, in specific legal settings. See, e.g., Lawrence A. Cunningham, *Capital Market Theory, Mandatory Disclosure, and Price Discovery*, 51 WASH. & LEE L. REV. 843 (1994) (application of chaos theory to capital market regulation); Lawrence A. Cunningham, *From Random Walks to Chaotic Crashes: The Linear Genealogy of the Efficient Capital Market Hypothesis*, 62 GEO. WASH. L. REV. 546 (1994) (application of chaos theory to capital market regulation); Michael J. Gerhardt, *The Role of Precedent in Constitutional Decisionmaking and Theory*, 60 GEO. WASH. L. REV. 68 (1991) (explaining Supreme Court constitutional jurisprudence using, among other mediums, a discussion of chaos theory); Glenn Harlan Reynolds, *Chaos and the Court*, 91 COLUM. L. REV. 110 (1991) (explaining Supreme Court constitutional jurisprudence using chaos theory); William H. Rodgers, *Where Environmental Law and Biology Meet: Of Pandas' Thumbs, Statutory Sleepers, and Effective Law*, 65 U. COLO. L. REV. 25 (1993) (discussing chaos theory surfacing in evolutionary biology commentary as a metaphor for evolution of environmental law).

22. My working definition of mediation is

a voluntary dispute resolution process in which a third party facilitates and coordinates the negotiations of disputing parties . . . [but] does not have the authority to impose a decision upon the disputants. Instead, the mediator guides the disputants through a discussion of their problem, the issues that need to be resolved, and alternative solutions for resolution of the dispute.

I use a particularly satisfying outcome from my mediation experience to ground the general complex adaptive systems theory in terms relevant to dispute-resolution theory.²³ Although Part II generally concludes that mediation is superior to litigation with regard to capturing the qualities of complex adaptive systems, Part III offers some observations on the practical limitations complex adaptive systems present once the islanders refine their desired performance-based conditions. These limitations, inherent in any complex adaptive system, point to the adjudicative model as a necessary component, though not necessarily the predominant component, of a sustainable, adaptive dispute-resolution system.

In reviewing the advantages and limitations of mediation, I have relied largely on observations made quite eloquently by other commentators. What I hope to add to the analysis, however, is evidence that these advantages and limitations are neither accidental nor unrelated, but rather reflect the integrated dynamics and behavior of complex adaptive systems. My purpose is to demonstrate that the science of complex adaptive systems offers a general structural and behavioral model around which we should want to design our dispute-resolution system, and that mediation offers the dispute-resolution system model that most closely approaches that design. In general, I conclude that the islanders should build their dispute-resolution system around a core model of mediation, but with an adjudication escape valve to deal with situations requiring greater structure and order. In other words, they should adopt a model in which adjudication, not mediation, is the "alternative" form of dispute resolution.

MITCHELL & DEWHIRST, *supra* note 6, at 3; see also CHRISTOPHER W. MOORE, *THE MEDIATION PROCESS: PRACTICAL STRATEGIES FOR RESOLVING CONFLICT* 14 (1986) ("Mediation is the intervention into a dispute or negotiation by an acceptable, impartial, and neutral third party who has no authoritative decision-making power to assist disputing parties in voluntarily reaching their own mutually acceptable settlement of issues in dispute.").

23. I am not at liberty to provide specific details and docket references to the case that forms the basis of my story; however, I will attest that the description herein is accurate. The parties agreed soon after the settlement of the dispute that general descriptions of the litigation claims and mediated outcome could be used to illustrate the advantages of mediation.

II. DESCRIBING MEDIATION AS A COMPLEX ADAPTIVE SYSTEM

Dispute resolution fits the classic model of a system—the interaction of any two or more agents. There are many varieties of systems. As the emergence of complexity theory research suggests, one way of categorizing them is to focus on the order or disorder of behavior patterns. We might also ask whether a system is capable of sustaining its particular behavior pattern over a long term, and in the face of externally caused disturbances. Questions of this sort are the subject matter of the science of dynamical systems analysis. One branch of that field, complexity theory, focuses on the qualities of a particular variety of system—complex adaptive systems. As previously noted, complex adaptive systems balance order and disorder to produce sustainable dynamic behavior patterns. This trait allows complex adaptive systems to adapt to externally defined conditions more successfully, on average, than systems defined primarily by structured order or chaotic disorder.

Four fundamental properties carry out this balancing act: aggregation, nonlinearity, flows, and diversity. Suspecting that these qualities may be just what the islanders are looking for, we will delve further into their bases and their application to dispute resolution models. Moreover, to give greater context to the exploration, I will use a story from my mediation experience that illustrates how mediation fits the complex adaptive system model more closely than does adjudication.

The story begins with this simple setting: a corporate landfill owner and operator, my client, was sued by a neighboring resident. The resident alleged the landfill operations had: (1) reduced his property value through their mere presence near his property; (2) spoiled his drinking water through alleged groundwater contamination; and (3) lowered the water table on his property, thereby interfering with his use and enjoyment of several ponds located on the property. Soon after the landfill owner filed an answer, the judge referred the parties to a court-appointed mediator. It is remarkable how this classic tort case, once submitted to mediation, became a classic mediation case—a true “orange and peel” dispute,²⁴ that allowed mediation to re-

24. There is no point in two people fighting over an orange if one wants just the peel and the other just the pulp. See ROGER FISHER & WILLIAM URY, *GETTING TO YES* 59 (1981).

veal how it embodies each of the four properties of complex adaptive systems.

A. Aggregation—The Parties

An individual ant usually displays an overwhelming capacity for single-minded behavior designed to fulfill a narrowly-defined role, such as foraging, building, defending, and so on.²⁵ By limiting observation to an individual ant, one would not intuitively predict the behavior of the ant aggregate—the ant colony. The ant nest, unlike an ant, is highly adaptive, surviving over time periods far in excess of an individual ant and in the face of a variety of environmental hazards, any one of which poses death to individual ants.

This pattern of adaptive collective behavior emerging from interconnected parts is found throughout nature and human society.²⁶ For example, Adam Smith, in his “invisible hand” theory of macroeconomic behavior, recognized that individually hedonistic behavior, when amassed in the aggregate, could lead to collectively optimized economic outcomes under certain conditions.²⁷ Garrett Hardin’s classic “tragedy of the commons” theory, on the other hand, demonstrates how under different circumstances individually rational behavior can lead to disastrous collective results.²⁸ Not all emergent behavior patterns are necessarily beneficial to all components of the system.

25. See HOLLAND, *supra* note 13, at 11.

26. Emergence is “a process that leads to the appearance of structure not directly described by the defining constraints and instantaneous forces that control a system.” James P. Crutchfield, *Is Anything Ever New?: Considering Emergence, in* COMPLEXITY METAPHORS, *supra* note 13, at 515, 516. Cohen explains that the key to understanding why emergence occurs lies in the number of system components and their interaction. With increasing numbers of system components, eventually the sum effect of the interactions between the components becomes a dominating characteristic of the system. See COHEN, *supra* note 13, at 182. For example, a system consisting of 10 components has 45 possible one-to-one pair combinations; a system of 1000 components has almost 5,000,000 such combinations; and a system of 1 million components has almost 5 billion such pairings. See *id.* In large systems, therefore, “if the effect of any particular interaction is tiny, we may not be able to work out what it is. We can’t study it on its own, in a reductionist manner, because it’s too small; but we can’t study it as part of the overall system, because we can’t separate it from all the other interactions.” *Id.*

27. See KAUFFMAN, *supra* note 13, at 208-09 (discussing Smith’s “invisible hand” theory in terms of complex adaptive systems).

28. See Garrett Hardin, *The Tragedy of the Commons*, 168 *SCI.* 1243 (1968) (explaining why, in the exercise of self-interest, herders having access to a common grazing field will overexploit the resource to their individual and collective detriment).

The key to understanding these and similar emergent behaviors is that they are a function of the aggregation of the individual parts that comprise a system. Even when the individual parts are not particularly multi-talented or intelligent, or when they are acting solely out of self-interest, emergent collective behavior may become highly adaptive and, we can hope, beneficial to the collective whole. This effect is amplified with an increasing number of decision making components, or patches as they are known in the complex adaptive systems literature.²⁹ The problem is that there is no reliable way to predict, simply on the basis of observation of any of the system's individual parts, what form emergent behaviors might take and to what end. You have to let the whole system run to see what happens.³⁰

How can we integrate the idea of aggregation leading to adaptive emergent behaviors into our design of a dispute resolution system for the islanders? The mediation model offers some promising leads. For purposes of dispute resolution systems, the medium of aggregation is the participants, or more particularly their interests. The classic adjudicative model imposes significant obstacles to assembling a multipatch system environment.³¹ First, plaintiffs must establish standing to have access to the adjudication system, which in itself, can be an imposing burden even when the plaintiff brings strong interests to bear.³² Assuming that burden is satisfied, the plaintiff's complaint, by specifying the defendant, establishes the initial boundary of participant-interest aggregation. Defendants must follow the rules of third-party practice to expand that boundary,³³ and par-

29. See KAUFFMAN, *supra* note 13, at 247-71.

30. See *id.* at 288-89. This "incompressibility" of the evolution of complex adaptive systems is inherent in the chaotic behavior that is a necessary component if the system is to be adaptive. In other words, "there is no faster way of finding out how a chaotic system will evolve than to watch its evolution. The dynamical system itself is its own fastest computer." Roderick V. Jensen, *Classical Chaos*, 75 AM. SCIENTIST 168 (1987).

31. The class action procedure is no exception to this statement, as it is limited to classes of persons sharing significant commonality and thus presenting essentially one voice in the adjudication. See, e.g., FED. R. CIV. P. 23(a) (stating that class representatives must establish that their claims are typical of the class and there are common questions of fact or law).

32. See, e.g., *Lujan v. Defenders of Wildlife*, 504 U.S. 555 (1992) (denying standing to plaintiffs who expressed strong ethical, aesthetic, and scientific reasons for challenging federally funded construction projects allegedly affecting endangered species).

33. See, e.g., FED. R. CIV. P. 14 (detailing the procedures for and restrictions on third-party practice).

ties who neither the plaintiff nor the defendant selects for inclusion must satisfy the burden of rules of intervention.³⁴ The very existence of these institutional barriers provides strategic incentives for the parties to use them: if the defendant can prevent adjudication by relying on technical standing principles, the battle is won; or if the plaintiff can block an intervenor who might add weight to the defendant's arguments, it is in the plaintiff's interests to fight the intervention. While it is certainly possible to assemble large multiparty actions notwithstanding these hurdles and the parties' incentives to employ them,³⁵ the cases denying plaintiff standing, defendant access to third-party practice, and nonparty intervention are legion.

The mediation model eliminates many of these barriers to aggregation of participant interests by making the issue of who participates itself one for mediation.³⁶ Although disputants generally self-select each other even for purposes of voluntary mediation, basic mediator training instructs that a mediator should look for issues that require other participants for full resolution and then ask the mediating parties whether that is not the case.³⁷ To be sure, the mediating parties are in control of the participant aggregation boundary, but there are no institutional barriers for parties to hide behind that would legitimate exclusion of additional interests. A person entering mediation is unlikely to plan a strategy for erecting barriers to entry, as there are no rules to use nor any judge to apply them. Rather, a mediating party who does not wish to broaden the participant pool at

34. See, e.g., FED. R. CIV. P. 24 (detailing the procedures for and restrictions on intervention).

35. Indeed, mass-party, multidistrict tort litigation has become a specialty practice area and subject of study. See, e.g., LINDA S. MULLENIX, *MASS TORT LITIGATION: CASES AND MATERIALS* (1996).

36. This will not be as true for mediation of mandatory settlement conferences if the participant boundaries are established as the adjudicating parties.

37. One widely used mediator training manual advises that

[t]here are often outside factors or unrepresented interests that will influence an individual's willingness or ability to mediate a resolution of the dispute. The opinions of friends, relatives, spouses, or employers may affect the disputants in the mediation The effective mediator should identify and evaluate any external factors that are influencing the present negotiations.

MITCHELL & DEWHIRST, *supra* note 6, at 55; see also MOORE, *supra* note 22, at 105 ("While the mediator usually should not choose who the disputants are or who will participate in negotiations, he or she may help the parties decide who should be present.").

the request of another existing participant must be able to convince the other party not to enlarge the number of participants.

Indeed, even when other participants are not included, the mediation model is more amenable to having their interests represented through existing participants. In the landfill matter, for example, it became evident early in the negotiations that the neighbor was less concerned about the effects of the alleged drinking water contamination on his health than on the more fragile health of his good friend who had occupied a guest house on the neighbor's property on a semi-permanent basis. In the adjudication of the matter, the landfill owner might have attempted to prevent having that nonparty interest introduced into the proceeding by exercising standing or evidentiary barriers against the plaintiff. But in the mediation stage, what could the landfill owner do? That was the plaintiff's interest, and the landfill owner had to bear that in mind to accomplish anything productive in the mediation.

Hence, by making the participant interest aggregation boundary a matter for negotiation rather than adjudication, and by allowing nonparticipant interests to be openly channeled into the mediation by willing participants, the mediation model provides a much wider lens opening for the emergence of collective results that exceed the vision and perspective of any individual participant.³⁸ Even though each participant may very well approach the mediation with pure self-interest in mind, the aggregation property suggests that the flourishing of interests will produce options no self-interested participant would have considered.

B. Nonlinearity—The Procedures

If we were to study the relationship between a predator species, such as a population of foxes, and its prey, a population of rabbits, a reasonable starting proposition might be that as the fox population increases the rabbit population will drop. Over

38. The one obvious exception to this conclusion is the possibility in adjudication of nonparty intervention over the objection of all existing parties. *See, e.g.*, FED. R. CIV. P. 24(a) (intervention as of right). While there is nothing to prevent a nonparticipant from requesting a chair at the mediation table rather than waiting to be invited, there is no procedure to require the existing participants to agree to the request. Of course, the presence of a strong request to participate would likely suggest to the existing participants that any mediation outcome that does not include the additional party is unlikely to avert additional disputes.

time, however, a declining rabbit population will fail to support the fox population at increasing levels, and foxes will begin to decline. Eventually, rabbits might bounce back, allowing foxes to increase in number again. Add hawks and bobcats into the picture and soon it becomes very difficult to predict what any species' population will be based on present-day figures. The relationships between the predator and prey species' populations has become nonlinear.³⁹

Nonlinearity means that the relationships of system components we wish to measure do not exhibit mathematical proportionality.⁴⁰ In the predator-prey model just discussed, for example, if the fox population is at ten, rabbits could be at fifty or 500 depending on whether the fox population is increasing or decreasing. To be sure, the relationship between the populations may be direct, even deterministically so; but it is not proportional or linear for all values. Indeed, despite the neat and orderly world implied by classical mathematics and science, most of the world is governed by nonlinearity. The science of nonlinear systems is an important adjunct to the study of complex adaptive systems, revealing the inherent unpredictability of systems governed by determinate relationships that yield complicated, seemingly random behavior. Of course, it is precisely the ability to bend, to avoid being locked into rigidly linear behavior, that allows complex adaptive systems to adapt to changing circumstances.⁴¹ Nonlinearity may be a nuisance for purposes of predicting system behavior, but it helps sustain the system in the long run.

In what manner can we design the islanders' dispute resolution system to capture the nonlinearity component of complex adaptive systems? Here again, the mediation model displays the desired properties. The concept of nonlinearity can serve as a metaphor for the degree to which dispute resolution proceedings can unpredictably drift off of some preordained outline of events

39. See HOLLAND, *supra* note 13, at 16-18.

40. A system is described as linear when the relationship of the agents' interactions can be described in strictly proportional terms (e.g., $y = 2x + 3z$). A system is nonlinear, therefore, if the relationships of the agents represents a function in which the output of an element is not proportional to its input. See P.G. DRAZIN, *NONLINEAR SYSTEMS* 1 (1992).

41. This phenomenon is revealed in the study of what are known as system "attractors"—the descriptions of system behavior according to the degree of nonlinearity involved. See COHEN, *supra* note 13, at 178-218.

in order to explore possible solutions. The procedures of any particular dispute resolution model establish the bounds of this nonlinearity feature. Civil trial litigation, for example, follows a rather predictable course of events spelled out in the rules of procedure: plaintiff files compliant, defendant answers, a motion hearing might be held, discovery ensues, summary judgment motions might be filed, a pretrial conference is held, and so on. An experienced litigator can map out the litigation process and even give reliable estimates of when each stage will occur. Deviation from the plan often occurs, but only when permission is sought and received and usually under tightly defined conditions. Neither the parties nor the judge are well-positioned to allow nonlinearity to creep in.

By contrast, mediation is designed to give the parties and the mediator more control over the unfolding of the proceedings. Mediators usually begin the proceedings by asking the parties to abide by a skeletal set of procedures designed to facilitate cordial negotiations, but beyond that there is no mandatory procedural routine.⁴² Either party or the mediator, for example, can suggest private caucuses at any time. The parties might lean on the mediator to promote back-and-forth negotiation, or they might evolve toward a conversational negotiation style with little or no mediator officiating. In essence, any pathway of proceedings is available so long as the participants want to take it and the mediator agrees to continue mediating.

The landfill story illustrates this property well. The mediator began the process in the usual manner: plaintiff presented his story; then the landfill operator presented its version. Both parties had brought groundwater hydrology experts, and it quickly became apparent that the two parties held diametrically opposed conceptions of the flow of groundwater around the landfill. The landfill operator alleged groundwater flowed from the neighbor's property toward the landfill, in which case the drinking water contamination was impossible; the neighbor said the opposite. The mediator must have sensed that tension was mounting between the two opposing experts over this potential impasse is-

42. Thus, "[f]requently it will be sufficient to ask the parties to listen to each other without interruption." MITCHELL & DEWHIRST, *supra* note 6, at 19. In some cases, of course, agreement on more carefully designed procedures about order of speaking, interruptions, caucuses, and other guidelines may be useful to the mediation. See MOORE, *supra* note 22, at 119-20.

sue, and he suggested separate caucuses.⁴³ During the caucuses, the mediator wisely focused the parties on the other issues in the case of property devaluation and pond levels, over which there was more room for debate and less room for impasse. After some time, the mediator rejoined the participants, but under a spirit of renewed negotiation rather than impasse. The groundwater issue would still have to be dealt with, we thought, but the mediation's unpredictable deviation off course had in fact set the parties back on course (you will have to read on to learn how this serendipitous event led to the resolution of the case without having to deal with the groundwater issue).

By accommodating greater nonlinearity, mediation promotes a bending and flexing of the proceeding to explore nooks and crannies of negotiation that may be entirely overlooked by adjudication proceedings, but which may hold the key to resolution. One cannot predict what those nooks and crannies may entail, where they are, or how to reach them; but one can improve the chances of finding them through the nonlinear approach to dispute resolution afforded by mediation.

C. *Flows—The Evidence*

The aggregation and nonlinearity properties of a complex adaptive system would not be apparent unless something were happening in the system. Complex adaptive systems are, in other words, dynamic, constantly changing, in flux.⁴⁴ Generally speaking, the change in complex adaptive systems involves a flow of some medium. In an economy, for example, money and the factors of production move throughout the system from component to component. Ecosystems could be described by following the flow of biokinetic energy. The Internet is all about the flow of information. When such flows take place in the context of complex adaptive systems experiencing aggregation and nonlinearity, the flows themselves exhibit complex, circuitous paths known as feedback loops.⁴⁵ The multiplier effect in eco-

43. Caucuses, in which the mediator meets individually and confidentially with each participant, are "designed to eliminate barriers that may block a successful resolution of the dispute." MITCHELL & DEWHIRST, *supra* note 6, at 75.

44. A nonlinear system is considered dynamical if the (nonproportional) relationships of the agents evolve with time or with some variable like time. See DRAZIN, *supra* note 40, at 1.

45. Adaptation is associated with the feedback and feedforward loops made possible by multiple paths of interactions between system components and thus "is an

nomic theory, for example, explains how money transferred at one stage of a series of transactions moves from stage to stage and amplifies the effect of the initial transfer.⁴⁶ Similarly, certain grasses are adapted to withstand fire and also to promote the occurrence of fire, so that as wildfires occur, over time these species successively become more and more predominant.⁴⁷ These and similar relationships tend to be dissipative, in that they work in one direction but not the other.⁴⁸ For example, even if areas of a tropical rain forest that have been deforested were left alone for decades, a rain forest ecosystem might not re-emerge to re-create its prior state; new relationships between biological and physical resources may have already taken over and be leading toward different regimes.⁴⁹ Hence, complex adaptive systems depend on their flow patterns to strengthen and regularize the aggregation and nonlinearity effects, thus enhancing long-term adaptiveness.

What is the medium of flow in our islanders' dispute resolution system? How can we take advantage of its feedback loops to enhance adaptiveness and sustainability? The mediation model sheds light on answers to both questions. In dispute resolution, the medium of flow is evidence—the information the parties use to attempt to influence each other or the adjudicator.⁵⁰ Consider, for example, the importance of the “rules of evidence” in civil litigation and the absence of such rules in most mediation models. In particular, the notion of relevance, which plays a large filtering role in adjudicative models,⁵¹ is irrelevant in directing the flow of evidence in mediation. Mediation is an evidence free-

emergent property which spontaneously arises through the interaction of simple components.” GLEICK, *supra* note 19, at 339 n.314. Adaptation allows the system to “restructure, or at least modify, the interaction pattern.” CASTI, *supra* note 13, at 271.

46. See HOLLAND, *supra* note 13, at 23-25, 84-87.

47. See Peter M. Vitousek et al., *Biological Invasions as Global Environmental Change*, 84 AM. SCIENTIST 468, 474 (1996).

48. The Nobel laureate Ilya Prigogine defined a dissipative system as one for which the driving force is the nonequilibrium flux of matter and energy through the system that increases order and sustainability in the system. Because these systems experience nonequilibrium in terms of input, they necessarily cannot be “reversed” so as to replicate the conditions of the system at a prior point in time. See KAUFFMAN, *supra* note 13, at 20-21.

49. See EDWARD O. WILSON, *THE DIVERSITY OF LIFE* 272-74 (1992).

50. Thus, in mediation “there is a flow of information from the disputing parties to the mediator. The mediator’s function is to facilitate this flow of information.” MITCHELL & DEWHIRST, *supra* note 6, at 15.

51. See, e.g., FED. R. EVID. 402 (“Evidence which is not relevant is not admissible.”).

for-all, regulated only by the participants' respective evaluations of what to include and how to weigh what the other participants include. In particular, the parties' desires, feelings, fears, and other emotions that are likely to underlie their positions and motivations for disputing are fair game as mediation evidence.⁵² As this wider spectrum of evidence enters the more nonlinear and aggregated medium of mediation, it is more likely to enhance the flexible qualities those properties bring to complex adaptive systems.⁵³

Indeed, the property of flow is what turned the landfill story around. After the mediator deftly maneuvered the proceedings away from the groundwater flow issue through caucuses, the resumed joint negotiations focused on the property value and pond level issues. By late afternoon, the participants had assumed a relaxed conversational familiarity, and by sheer chance one of the landfill representatives asked the neighbor why he liked his ponds so much. The neighbor explained that he enjoyed the ponds in the evening when ducks and other waterfowl landed there, and that his friend who lived in the guesthouse was an avid angler. Indeed, he added that his dream was to excavate the area between the ponds in order to join them into one large lake that could stock a larger fish population and attract more waterfowl.

That exchange, which was the key to resolution, might very well have taken place in a deposition in civil litigation, but consider the differences in the flow of evidence: in the adversarial deposition context, the neighbor might have been reluctant to open up in this manner; the deposition likely would not have been attended by so many representatives from the parties; the

52. "Mediation is clearly the preferred procedure when venting is necessary." Frank E. A. Sander & Stephen B. Goldberg, *Fitting the Forum to the Fuss: A User-Friendly Guide to Selecting an ADR Procedure*, 10 NEGOTIATION J., 49, 56 (1994); see also FLETCHER KNEBEL & GERALD S. CLAY, BEFORE YOU SUE: HOW TO GET JUSTICE WITHOUT GOING TO COURT 250 (1987) ("Mediation permits necessary psychological eruptions."). The psychological impact of various forms of dispute resolution on the parties can be an important factor in how we perceive the process—for example, whether it takes the form of "conflict" or "healing" or something else. See Williams, *supra* note 7, at 42-56.

53. One commentator, using terms remarkably close to complex adaptive systems theory, has observed that, as a system, mediation "is more efficiently organized for the creation and storage of knowledge. Observational methods of mediation processes are gradually refined, while interccgation and questioning procedures are purified and grow more individualized." Luis Arturo Pinzón, *The Production of Power and Knowledge in Mediation*, 14 MEDIATION Q. 3, 15 (1996).

deposition likely would have continued on to other topics without giving anyone time to consider possible implications of the bit of information just learned; later, the trial attorney might have skimmed over the exchange in the transcript while searching for more "relevant" evidence; and so on. In mediation, by contrast, the parties were able immediately to "go with the flow" and, ultimately, to reach resolution as a result.

D. Diversity—The Remedies

A single tree in a tropical rain forest ecosystem can harbor over 10,000 distinct species of insects, and it is possible to walk long distances in the rain forest without twice encountering the same species of tree.⁵⁴ The rain forest is not unique in this degree of diversity. The human brain contains a multitude of different neurons arranged in many different regions; New York City is anything but uniform in its array of people and businesses.

Diversity of such magnitude is the signature of complex adaptive systems. As properties of aggregation, nonlinearity, and flow increase the complexity of the whole, each component of the system becomes less able to duplicate the whole and more resigned to relating to other system components through its particularized niche.⁵⁵ Through competition and cooperation, niches become increasingly differentiated, and the number of different niches grows.⁵⁶ The diversification of components in turn adds to the emergent effects of aggregation, makes system nonlinearity even more unpredictable, and opens the door to more complicated and far-ranging flow feedback loops. At this stage the system as a whole depends on no single component for its long-term sustainability, but rather is, in all senses of the concept, a complex adaptive system.

What measures can we take to ensure the islanders' dispute resolution system promotes component diversity and its adaptive effects? As with the other three complex adaptive system properties, mediation is a promising model. Disputes are resolved through formulation and evaluation of options. The more variety of options that is permitted to be considered, the more likely resolution will be reached as the system exerts the influences of

54. See HOLLAND, *supra* note 13, at 27.

55. See *id.* at 27-29.

56. This is precisely what Darwin revealed through his theory of natural selection. See JONATHAN WEINER, *THE BEAK OF THE FINCH* (1994).

aggregation, nonlinearity, and flow to formulate and test each option. In litigation, the diversity of options can be tightly constrained by the process of requiring a plaintiff to specify the desired relief and by the limitations of the adjudicator's discretion to depart from prescribed common law and statutory remedies.⁵⁷ By contrast, a significant stage of any mediation is "options brainstorming," a process more likely to generate a wide diversity of remedies for participant evaluation than the adjudicative model permits.⁵⁸

The landfill story embodies this property perhaps better than any other example. Within a millisecond of learning that the neighbor wanted to excavate the area between his ponds, all of the landfill representatives in the room looked at each other in wonder. The landfill was required by state law to provide a daily cover of dirt over the exposed refuse face. To minimize costs, the landfill had been obtaining the soil from an area of its property not designated for use and which happened to be adjacent to the neighbor's property. But that source was running out, and the price of dirt was increasing. "About how much area would you like to excavate, and how deep?" asked the landfill's engineer. The neighbor, quite casually and with no apparent idea of why the landfill would be interested in his plans, informed us that about three acres, twenty feet deep would do the job. After some simple calculations, the landfill determined that it could pay the neighbor the equivalent of the money damages requested in the suit and still save money compared to buying the quantity of dirt involved on the open market! Suddenly the neighbor's dream lake, an underlying motive for his bringing suit, was the landfill's dream dirt. Could it be possible that the landfill would not care who would "win" on the various disputed issues at trial, so long as what made economic sense to the landfill also happened to make the neighbor satisfied? Would the neighbor reach the same conclusion? Indeed, after some additional discussion the neighbor determined that an agreed upon lump sum would allow him to access a public water supply, thus mooted the question of

57. See Menkel-Meadow, *supra* note 9, at 7 (describing the "binary win-lose" structure of adjudicative model remedies).

58. Mediators are trained that "[d]uring this stage the parties propose alternatives for resolving the dispute. The parties proceed to discuss these alternatives in an effort to effect a resolution of the problem." MITCHELL & DEWHIRST, *supra* note 6, at 15; see also MOORE, *supra* note 22, at 199-217 (describing strategies for generating options for settlement).

drinking water contamination, line his lake with clay to avoid water level depletion, and cover the neighbor's alleged property value losses and attorney fees. And the landfill owner would be happy to have the opportunity to excavate the lake in return. If ever a win-win situation existed, this was it.

I cannot say that a similar outcome would not have been achieved in that case had it not been referred to mediation, but I am confident that the chances would have been more remote. The nature of the mediation simply opened up the possibilities of reaching that result by freeing the parties from the constraints of adjudication. This example and others like it show that mediation, when taken seriously, boosts the adaptive qualities of dispute-resolution techniques.

III. LIMITATIONS ON MEDIATION IN A COMPLEX WORLD

Convinced that complex adaptive systems provide the benchmark for your dispute resolution model, and that mediation comes closer to meeting that benchmark than does adjudication, you outline a mediation model for the islanders and attach it to an e-mail to the islanders with the advice that they construct their dispute resolution system with mediation as its core. A few days later they respond by thanking you for your useful advice, but also by asking you to amend the proposal by explaining how the dispute resolution system will satisfy the following additional criteria:

1. The dispute resolution system must allow for efficient and, ultimately, socially binding enforcement of its outcomes;
2. The dispute resolution system must not disadvantage financially or politically oppressed segments of the population;
3. The dispute resolution system must accommodate incorporation and uniform enforcement of some strongly defined social rights and conventions; and
4. The dispute resolution system should produce outcomes that provide guidance and direction to similarly situated persons in the future.

Whereas their first set of criteria pointed toward flexibility and compromise, you are concerned that the islanders now are veering toward preferring a more rigid system. Yet none of their new conditions strikes you as unreasonable. You research whether complex adaptive systems theory holds the answers to this dilemma.

Having extolled the virtues of complex adaptive systems and described why mediation approaches them more fully than does adjudication, I must now disclose their limitations. Mediation is more like a complex adaptive system, and adjudication more unlike one, in ways I have not yet revealed. The reality of complex adaptive systems is that they are actually quite average in performance over any short-term horizon; their virtue is in sustaining that level of performance over the long term.⁵⁹ It is entirely possible, indeed probable, that for any fixed environment the system design that is best suited for withstanding adverse conditions, the maximally "fit" system, will be one which is highly structured or highly chaotic—i.e., not a complex adaptive system. The problem is that over time environmental conditions change, and if the system designed for one set of conditions cannot easily adapt to change, then what were once fit qualities may become liabilities. By designing the maximally fit system for the moment, you can wind up winning the battle but losing the war.

Adjudication, of course, is about winning battles. It produces rules of law that define who wins and who loses. It defines outcomes narrowly between winners and losers. In its totality, it channels litigants toward strategies of maximal fitness for winning the particular dispute at hand. Mediation, by contrast, induces a different set of strategies by allowing the process and the participants to transcend the battle by recognizing, for example, the possible outcomes that exist between complete winning and losing, the full range of issues and interests that should come to bear on the matter, the posture the participants want to be in when another dispute of this matter arises in the future, and the long-term interests of the participants, particularly in relation to each other. Mediation, in other words, pushes thinking toward devising long-term average fitness solutions.

As the islanders have illustrated with their amended list of conditions, however, sometimes other forces in society besides

59. See KAUFFMAN, *supra* note 13, at 224-35.

dispute resolution—forces that may well exist because of applying complex adaptive system styles of thinking to other social issues—may require that winning the dispute battle be placed above other goals for dispute resolution. The list of such conditions the islanders have devised may not be exhaustive, but it serves to illustrate this point well. Indeed, the qualities specified in the islanders' amended list have been the subject of extensive commentary questioning the efficacy of mediation and other forms of ADR.⁶⁰ Lon Fuller, for example, observed that “[i]t is . . . not in the making of legal rules, but in their enforcement and administration that a certain incompatibility may be perceived between mediative procedures and ‘the rule of law.’”⁶¹ Owen Fiss has pointed out the difficulties of mediation when power imbalances exist between the participants⁶² and has used decisions emanating from the adjudicative model such as *Brown v. Board of Education*⁶³ to illustrate how ineffective mediation might be in advancing important antimajoritarian rights.⁶⁴ In short, the common law system of adjudication and precedent is a highly effective means of generating relatively predictable, flexible rules of conduct.

So what are the islanders to do? Is there any way to satisfy both lists of desired qualities? To some extent, the answer is no. Complexity theory research suggests that within any complex adaptive system there exist “conflicting constraints” between different structural traits.⁶⁵ These constraints limit the degree to which any one trait can be adjusted without causing failure or degradation of another constraint. The exoskeleton of an ant, for example, presents tremendous advantages at the size of an ant, but if ant size were to increase eventually the proportional weight of the exoskeleton would result in the ant's demise. Similarly, dispute resolution systems must deal with the conflicting constraints inherent in the islanders' two lists of desired qualities. At a certain level, for example, the privacy that facilitates

60. For a comprehensive review of the critical commentary and exploration of why it has diminished substantially in the 1990s, see Eric K. Yamamoto, *ADR: Where Have All the Critics Gone?*, 36 SANTA CLARA L. REV. 1055 (1996).

61. Fuller, *Mediation*, *supra* note 5, at 328.

62. See Owen M. Fiss, *Against Settlement*, 93 YALE L.J. 1073, 1076-78 (1984). Dealing with the power imbalance problem arises frequently as a point of mediator training. See, e.g., MITCHELL & DEWHIRST, *supra* note 6, at 22, 55.

63. 347 U.S. 483 (1954).

64. See Fiss, *supra* note 62, at 1089.

65. See KAUFFMAN, *supra* note 13, at 169-73.

the flow of information in mediation may interfere with other social goals, such as identification of bad actors, community interest in remedial measures, and accountability of mediators.⁶⁶ Every society, therefore, must design its dispute resolution system with the principle of conflicting constraints in mind.

As for the islanders' society, I will leave you with one last principle from complexity theory to keep in mind. Complex adaptive systems research suggests that systems approaching the brink of total disorder and chaos, but restrained from falling in by an adequate measure of order and stability, are the most adaptive and sustainable.⁶⁷ In other words, design your system based around aggregation, nonlinearity, flow, and diversity as the preferred regimes, and use order and stability only to regulate the chaos. Using that maxim, I suggest the islanders build their dispute resolution system around the model of mediation, and use adjudicative techniques only sparingly for those situations when a maximally fit outcome is needed and the only way to achieve it is through a coerced, binary win-lose judgment process.

IV. CONCLUSION

Obviously, we do not have the luxury the islanders have of building a dispute resolution system from the ground up. We are stuck with our history and what brought us to this point. But Justice Holmes eloquently made the point that often "precedents survive in the law long after the use they once served is at an end and the reason for them has been forgotten. The result of following them must often be failure and confusion from the merely logical point of view."⁶⁸ The islanders' story can be instructive, therefore, as it forces us to ask the question whether the adjudicative model we use is really what we want or is in fact a collection of "survivals." If we could start over, and knowing what we know today, would we do it all over again the same way? When our answer to that question is no, as I believe it should be for many aspects of our adjudication system, we ought

66. It is with respect to the constraint factor that *quantitative* aspects of dispute resolution such as cost and time become most relevant. See Edwin H. Greenbaum, *Lawyers' Agenda for Understanding Alternative Dispute Resolution*, 68 IND. L.J. 771, 785 (1993) (describing cost and time as "constraints" on dispute resolution models).

67. See KAUFFMAN, *supra* note 13, at 86.

68. OLIVER WENDELL HOLMES, JR., *THE COMMON LAW* 35 (1881).

to examine whether there is room for more intentional adjustment.

To be sure, it would be unreasonable to say that our current dispute resolution system—one built around the adjudicative model with bits and pieces of “alternative” models being slowly engrafted onto it—is not a complex adaptive system.⁶⁹ But the hallmark of any complex adaptive system is, of course, *adaptation*. Our dispute resolution system has endured and evolved for centuries because it has accommodated adaptation. Resistance to ADR on the ground that it represents change or disorder or disturbance of the present equilibrium thus ignores that history. Indeed, there should always be some next form of ADR on the horizon, for that is the only source of the next adaptation.

Oh, and by the way, within a few weeks after the mediation in the landfill case concluded, the parties had drafted an agreement outlining a settlement; within a year the excavation was completed; and I am told today by the landfill manager, a frequent guest of the neighbor now, that the fishing at the lake is pretty good.

69. Indeed, the adjudicative model in the United States has evolved tremendously, and that capacity is likely why it has gradually begun to “resemble, incorporate, or subsume ADR.” Judith Resnick, *Many Doors? Closing Doors? Alternative Dispute Resolution and Adjudication*, 10 OHIO ST. J. ON DISP. RESOL. 211, 260 (1995). In evolutionary biology terms, the various “species” of dispute resolution are displaying convergent evolution—“the increasing similarity during evolution of two or more unrelated species.” WILSON, *supra* note 49, at 395.

