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***Democracy's Discontent* in a Complex World: Can Avalanches, Sandpiles, and Finches Optimize Michael Sandel's Civic Republican Community?**

HOPE M. BABCOCK*

In *Democracy's Discontent: America in Search of a Public Philosophy*, Michael Sandel looks about him and finds a vast and complex world governed by impersonal institutions and structures, in which discontented, anxious, and frustrated individuals are losing control over the forces that govern their lives, and in which the moral fabric of community is unraveling. His solution is to revitalize the civic strand of freedom found in republican politics and thus equip individuals to govern themselves. Sandel wonders how civic republicanism can exist in today's world. Historically, republicanism has found a home in small, bounded places, which were largely self-sufficient and inhabited by people whose living conditions, education, and commonality enabled them to deliberate about public concerns. His structural answer is to disperse sovereignty both upwards and downwards of the modern nation state into a multiplicity of political communities and social institutions.¹ His normative answer is to infuse substantive moral discourse back into public political debate.²

Sandel concedes that there are risks to what he proposes. Practicing politics in a multiplicity of settings requires citizens who can abide the ambiguity associated with divided sovereignty, who can think and act as "multiply situated selves."³ He worries that such "multiply-encumbered citizens" may drift toward "formless, protean, storyless selves, unable to weave the various strands of their identity into a coherent whole."⁴ He labels the capacity to negotiate between these sometimes overlapping and sometimes conflicting obligations a civic virtue distinctive of our times.⁵ Sandel admits that granting the political community a stake in the character of its citizens may result in bad communities forming bad characters, and that that risk may only be partially cured by his proposal to disperse political power and construct multiple sites of civic forma-

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1. A revitalized civic life, Sandel believes, can be nourished in the particular communities where people live. Larger, more distant institutions must somehow be connected to political arrangements that reflect the identity of the participants in order to earn their loyalty. MICHAEL J. SANDEL, *DEMOCRACY'S DISCONTENT: AMERICA IN SEARCH OF A PUBLIC PHILOSOPHY* 345 (1996).

2. "Cultivating in citizens the virtue, independence, and shared understandings such civic engagement requires is a central aim of republican politics." *Id.* at 274.

3. *Id.* at 350.

4. *Id.* at 350-51.

5. *Id.* at 350.

tion.⁶ Others are not so gentle with his vision, finding seeds of coercion, exclusion, and intolerance in the civic republican search for a totalizing political narrative based on collective norms and shared virtues.

This article proposes to examine Sandel's civic republican community through the lens of complexity theory to test the robustness of his assumptions about the behavior of political communities and of the criticisms of his work.⁷ Complexity theory, which includes chaos and catastrophe theory, is an overarching field of mathematical analysis of the behavior of nonlinear dynamical systems.⁸ It offers a new way of thinking about the collective behavior of many basic interacting units (e.g., molecules, atoms, cells) that have the potential to evolve (or change) over time. While the definition of complexity is context-dependent,⁹ for complexity to emerge there must be both time (described by complexity theorists as an irreversible medium) and nonlinearity (a condition that produces complex and frequently unexpected results).¹⁰ Complexity theory shows why dynamic forces inevitably lead to unpredictable behavior in nonlinear systems, and that the most successful systems are those that maintain a balance between stasis and change and accomplish that result by maintaining a chaotic, random component in their midst.¹¹ Complexity theorists¹² are interested in explaining

6. *Id.* at 321.

7. There are many conceptions of community; Sandel addresses only one—the republican conception. Robert B. Fowler identifies five others (participatory, global, traditional, religious, and existential), noting as he does so that “[n]o set of categories can capture the current range of conceptions of community which are part of a large and expanding conversation.” ROBERT B. FOWLER, *THE DANCE WITH COMMUNITY: THE CONTEMPORARY DEBATE IN AMERICAN POLITICAL THOUGHT* 39 (1991). For a discussion of the republican conception of community, see generally *id.* at 63-79.

8. PETER COVENEY & ROBERT HIGHFIELD, *FRONTIERS OF COMPLEXITY: THE SEARCH FOR ORDER IN A CHAOTIC WORLD* 7 (1995). The science of these systems is known as complexity theory. This article's discussion of complexity theory owes a considerable debt to COVENEY & HIGHFIELD, *supra*; EDWARD O. WILSON, *THE DIVERSITY OF LIFE* (1992); 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).

9. COVENEY & HIGHFIELD, *supra* note 8, at 14 n.9.

10. *Id.* at 9.

11. Ruhl, *supra* note 8, at 1410.

12. The field of complexity has attracted molecular biologists, ecologists, theoretical physicists, chemists, computer scientists, philosophers, and economists. Although economics arguably straddles the divide between science and the humanities, it possesses nonlinear features characteristic of complex dynamical systems (e.g., speculative bubbles) and contains objective measures of economic and financial success (e.g., profits and losses, revenues, and stock prices to name just a few). See WILLIAM A. BARNETT ET AL., *ECONOMIC COMPLEXITY: CHAOS, SUNSPOTS, BUBBLES, AND NONLINEARITY* (1989); M.C. Adam & A. Szafarz, *Speculative Bubbles and Financial Markets*, 44 *OXFORD ECON. PAPERS* 626 (1992) (surveying literature); Lawrence E. Cunningham, *From Random Walks to Chaotic Crashes: The Linear Lineage of the Efficient Capital Market Hypothesis*, 62 *GEO. WASH. L. REV.* 546 (1996), cited in Lynn Stout, *How Efficient Markets Undervalue Stocks: CAPM and ECMH Under Conditions of Uncertainty and Disagreement*, 8 n.18 (unpublished manuscript) (in possession of author). There are also factors in financial markets that are not amenable to objectification, such as perceptions and rumors that can affect objective “fitness” measures. See Donald C. Langevoort, *Selling Hope, Selling Risk: Some Lessons for Law from Behavioral Economics About Stockbrokers and Sophisticated Customers*, 84 *CAL. L. REV.* 627 (1996); Donald C. Langevoort, *Ego, Human Behavior, and Law*, 81 *VA. L. REV.* 853 (1995). Although economists have taken a long time to recognize the inherent complexity of their

how order can emerge from this mass of evolving individual units and how unity can be found in diversity. They hope that their theory may lead to solutions to complex problems that contain an array of known and unknown variables in some time-dependent interaction.

Sandel has set out on the difficult task of solving a complex problem: how to restructure our sense of political community and thus reinvigorate our vision of citizenship. His effort, therefore, lends itself to analysis under the tenets of complexity theory. This article suggests that complexity theory exposes some fundamental weaknesses in Sandel's thinking, but at the same time may offer a means of refining those aspects of civic republicanism that have drawn the most criticism—its tendency toward fundamentalism and exclusiveness. Evolutionary biologists call this process of refinement “adaptive improvement” (or “optimization”),¹³ an open-ended process by which a structure evolves through interaction with its environment to deliver a better performance.¹⁴

This article's juxtaposition of apparent “unlikes,” a political philosophy and a scientific methodology, is not as strange (or strained) as it might first seem.¹⁵ Despite Sandel's desire to return to an idealized Athenian polis found in the character of its citizens and complexity theory's rejection of the Greek ideal of simplicity, there are surprising commonalities between the two approaches to complex problems. Sandel (and his fellow civic republicans) share with complexity theorists a vision of a universe poised on the edge of chaos. Both are searching for order in that chaos, finding important to their searches the notion of individuals being situated in a larger whole. Both seek a grand and totalizing communal narrative (a global behavior pattern) that will make sense of individual existence in a larger, complex whole.¹⁶

subject, the work of economists like Robert May and game theorists John Harsanyi, John Nash, and Reinhard Selton, 1994 Nobel laureates, is based on evolutionary and nonlinear principles. COVENEY & HIGHFIELD, *supra* note 8, at 335-37. According to Professor Lynn Stout, some economists, she among them, are exploring the brave new world of postmodern finance, one branch of which is called chaos (“rational bubble” or “sunspot”) theory. This application of chaos theory explores scenarios in which a small deviation of an asset's market price from its intrinsic value may be imagined through self-reinforcing cascade effects into wild price swings. Stout, *supra*, at 8.

13. COVENEY & HIGHFIELD, *supra* note 8, at 423.

14. *Id.* at 430.

15. Peter Coveney and Robert Highfield recognize that with regard to the humanities there are no objective yardsticks or fitness measures for determining which ideas will prevail. Rather, in the humanities, which idea wins depends on a collection of more arbitrary and subjective criteria (e.g., an individual's background, beliefs, and prejudices). The humanities distinguish themselves in this way from the sciences which depend for success on producing memes that can correctly account for and predict the results of experiments and observations (i.e., criteria which provide the measure of the memes's “fitness”). *Id.* at 258. For a more detailed description of memes, see *infra* note 27.

16. For a critical view of grand narratives and totalizing thoughts, see JEAN-FRANCOIS LYOTARD, *THE POST-MODERN CONDITION: A REPORT ON KNOWLEDGE* (1984), cited in IRIS M. YOUNG, *JUSTICE AND THE POLITICS OF DIFFERENCE* 156 (1990) (stating “we have entered an era where knowledge is constantly changing, where our concepts of ourselves and of others are unstable, and where a teleological view of history can no longer anchor the meaning of our existence and our relationship with the social and physical world”), quoted in Adeno Addis, *Individualism, Communitarianism, and the Rights of Ethnic Minorities*, 67 NOTRE DAME L. REV. 615, 617 n.9 (1991).

But the approaches of civic republicanism and complexity theory are fundamentally different—the ideal community for each, the antithesis of the other. For example, while republican thought may situate (contextualize) the individual in a complex system (a political community), it tries to explain emergent phenomena, such as civil strife, anxiety, and discontent, in simple, reductive terms (i.e., individual behavior or civic character).¹⁷ In contrast, complexity theory is holistic and interactive, reaching beyond the behavior of individual units such as atoms and molecules, to seek a grand vision of the universe. Its preoccupation with the emergent or macroscopic properties of individual units makes it the antipode of the reductionist thinking of civic republicans.¹⁸

Sandel uses the concept of community to quiet and calm, to point the way from complexity and conflict¹⁹ toward a world of “tight boundaries” where like discourses with like.²⁰ In community, complexity theorists see diversity and randomness, competition and cooperation, variables and interactions, surprise²¹ and indeterminacy.²² While complexity theorists acknowledge that a system with nothing but these features might spiral out of control, a “rigid, immovable, perfectly ordered structure would allow no adaptation (improvement) at all.”²³

17. The civic republican search for the common or civic good in the character of a community's citizens has its roots in ancient Greece. *THE REPUBLIC, THE PORTABLE PLATO* 656-57 (Benjamin Jowett ed., 1984) (stating “the soul[] [is] the only place where community will ever succeed”), *quoted in* FOWLER, *supra* note 7, at 160. The Platonic ideal re-emerges in Fowler's “existential” model of community, which, like its ancient precursor, focuses on the community in the individual's soul. Plato, Fowler, and Sandel are most concerned with the individual who is nourished by and thrives in the community—the person whom the community creates. To them, it is the individual who is the story, “not in isolation to be sure, but not homogenized and destroyed by absorption into a character-denying community either.” FOWLER, *supra* note 7, at 155.

18. Coveney and Highfield cite as examples of classic reductionist thought elementary particle physics, where the goal is to find a “Theory of Everything” that would be expressed in one or a few equations describing the fundamental interactions between all forms of matter, or in molecular biology the “doctrine of DNA,” in which large parts of biology could be rationalized on the basis of molecular action. COVENEY & HIGHFIELD, *supra* note 8, at 12.

19. Civic republicans particularly fear competition among unencumbered, self-seeking individuals. MICHAEL WALZER, *RADICAL PRINCIPLES: REFLECTIONS OF AN UNRECONSTRUCTED DEMOCRAT* 98 (1980), *quoted in* Addis, *supra* note 16, at 642.

20. FOWLER, *supra* note 7, at 148. Strong community involves “fraternal sentiments and fellow-feeling,” a communal “mode of self-understanding.” MICHAEL J. SANDEL, *LIBERALISM AND THE LIMITS OF JUSTICE* 150 (1982), *quoted in* FOWLER, *supra* note 7, at 4; *see also* Addis, *supra* note 16, at 646 (criticizing the totalizing tendencies of “nationalist communitarians” to assimilate minorities into the dominant culture).

21. According to Ruhl, complexity theory has developed a “science of surprise” to explain why classical reductionism cannot produce predictive certainty when faced with dynamic nonlinear systems. Ruhl, *supra* note 8, at 1438-40.

22. Complexity theory teaches that the highest average fitness of a species occurs exactly at the point of “transition from order to chaos.” STUART A. KAUFFMAN, *AT HOME IN THE UNIVERSE: THE SEARCH FOR THE LAWS OF SELF-ORGANIZATION AND COMPLEXITY* 230 (1995), *cited in* Ruhl, *supra* note 8, at 1465 n.223; *see also* WILSON, *supra* note 8, at 9 (arguing that natural dynamism raises the diversity of life by means of local destruction and regeneration).

23. Complexity theorists believe that chaos, emergence, and catastrophe are inevitable components of sustainable, dynamical systems. Ruhl, *supra* note 8, at 1442.

The ideal for complexity theorists, therefore, is a very uncivic republican world precariously balanced on the edge of chaos.²⁴

If the teachings of complexity theory are correct—that chaos, emergence, and catastrophe are inevitable components of sustainable dynamic nonlinear systems—that these systems must, in other words, experience randomness to maximize self-sustainability,²⁵ and that matter has an innate tendency both to self-organize and generate complexity—then what does complexity theory teach us about Sandel's vision of political communities? Has Sandel missed an essential element for communal survival—the need for some amount of controlled (deterministic) chaos²⁶ in a nonlinear dynamic evolving system, like a political community? Is a civic republican community too simple, too inelastic with too few variables and opportunities for interactions to survive? Is Sandel's concern about self-seeking individuals unwarranted, but his worry about bad communities forming bad characters plausible? Should *we* worry that civic republicanism is what complexity theorists would call a *meme*,²⁷ a cultural virus that has the capacity to self-replicate in an informational diaspora where the unlike are either assimilated or excluded to the impoverishment of us all?²⁸

Some critics of civic republicanism, like Adeno Addis and Robert Fowler, share a vision of community closer to the image of community that a complexity theorist might have than that proffered by Sandel and his fellow civic republicans. Addis and Fowler see community as a struggle or a dialectic. They are critical of the failure of republicans, and communitarians in general, to acknowledge that groups are inherently unstable and transformable—that group identities are contingent.²⁹ To Fowler, “[c]ommunity is not a place or a thing; it

24. *Id.* Ruhl goes on to explain that somewhere between total order and total chaos is a regime of sustainable system behavior, called the region of complexity by complexity theorists, and that some chaos, emergence, and catastrophe must be experienced in the system to keep the system in that region. *Id.*

25. *Id.* at 1410. One of the major findings of complexity theory is that nonlinear dynamical systems must experience *randomness* to maximize *self-sustainability*. *Id.* at 1416.

26. “Deterministic chaos” is a term used in complexity theory to embrace both the chaotic behavior of nonlinear dynamical systems and the “deep order” present in those systems. COVENEY & HIGHFIELD, *supra* note 8, at 174; *see also id.* at 272 (discussing deterministic chaotic behavior in ant colonies).

27. A meme is a unit of cultural transmission which has the property of self-replication as it propagates from brain to brain—a pattern of information that has evolved to a form which induces people to repeat the pattern. Typical memes include individual slogans, catch-phrases, melodies, jingles, inventions, and fashions. COVENEY & HIGHFIELD, *supra* note 8, at 333-35 (citing RICHARD DAWKINS, *THE SELFISH GENE* 206 (1976) (explaining how ideas compete with one another for ascendancy in the minds of conscious people)); *see also* DANIEL DENNETT, *CONSCIOUSNESS EXPLAINED* 202 (1991) (responding to Dawkins); Glenn Grant, “Share-Right(s),” P.O. Box 36, Station H, Montreal, Quebec, H3C 2K5, Principia Cybernetica Web, “Memetics.” Coveney and Highfield complain that memes for classical equilibrium-based concepts have been infecting the minds of generations of science and economics students with the dogma that the behavior of complex systems can be deduced by summing their respective parts. *Id.* at 336.

28. According to Addis neither individualism nor communitarianism is good for ethnic minorities as individualism denies the desirability or even reality of groups, while communitarianism excludes or assimilates their members. Addis, *supra* note 16, at 615.

29. *Id.* at 622, 648, 655 (stating “group identities are constructed relationally and, as a result, they

is a calling, a struggle, a journey," in which diversity and disagreement are good things, as they provide the "basis for the dialectics or the conversation that may lead us closer to community and may remind us that vibrant community is always open, always in process."³⁰ Unless Sandel's vision of community can be optimized³¹ through a process of adaptive innovation³² to accommodate better the diversity and indeterminacy his critics embrace, complexity theory teaches that his civic republican polity is doomed to eventual extinction. Let us now turn to Sandel's theory of political systems and the insights that can be gained about its viability from the application of the teachings of complexity theory.

Sandel and other civic republicans, like Frank Michelman and Cass Sunstein, are distressed by what they sense to be a crisis over values in current American life brought on by an impoverished vision of citizenship that isolates individuals from the political community.³³ To civic republicans, a shared life, self-consciously accepted, even more than a common life, is crucial.³⁴ They believe that the country has somehow lost a vision of and chance for community during our historical evolution as a nation, and that the core of the American culture at our birth reflected republican norms which are more oriented toward community than liberal (or individual) values.³⁵ A return to civic republican values, a rediscovery, as it were, of shared virtues arrived at through collective discussion, therefore, is required for the republic's survival.³⁶ For Sandel and other civic republicans, these collective norms can best be achieved through political

are contingent and unstable"). But for communitarians, says Addis, the complete narrative is one that tells the story of a final harmonious union between the individual and the political community. *Id.* at 675.

30. FOWLER, *supra* note 7, at 161. Fowler prefers the "existential" model of community, precisely because it emphasizes paradox, tension, and even contradictions—end results civic republicans like Sandel are straining to avoid. *Id.* at 155.

31. Coveney and Highfield explain that the problem of calculating the "best" solutions in complexity theory becomes a matter of finding the optimal value of the function (i.e., its minimal or maximal value). The cost function of a given solution is best depicted as a landscape of potential solutions, called a "fitness landscape," where the height of each feature (or peak) is a measure of its cost. This undulating landscape is one way that complexity theory displays complex optimization problems. COVENEY & HIGHFIELD, *supra* note 8, at 107.

32. Adaptive innovation is a term used in complexity theory to describe how the process of adaptation and optimization refines the design of an organism through evolution. *Id.* at 16.

33. Fowler says that civic republicans attribute this malaise to the failure of Kant and the utilitarians to build a rational secular account for moral life. He identifies two other themes in the discontent of communitarians with current American life, a spiritual crisis (seen as a crisis over the absence of an inner life) and rampant individualism. FOWLER, *supra* note 7, at 9.

34. *Id.* at 4 (citing George A. Hillery, Jr., *Definitions of Community: Areas of Agreement*, 20 RURAL SOC. 111-23 (July 1955)).

35. FOWLER, *supra* note 7, at 25. Fowler rejects this conclusion, saying that the Founders were politically multilingual, inventive as well as eclectic, and cannot be put into any single category, including that of being mostly philosophical in their approach. *Id.* at 28.

36. Sandel seeks a return to an earlier time; a time when the "civic strand of American political discourse" predominated; when citizens deliberated among themselves about the common good and possessed the requisite knowledge of public affairs and a sense of belonging manifested by a concern for the whole, "a moral bond with the community whose fate is at stake." SANDEL, *supra* note 1, at 5-6.

participation.³⁷

If American society is to weather the . . . remainder of the present century, shared meanings and ideals must be rearticulated and reassessed The reconstitution of a genuine national political society requires widespread participation in working out a more explicit moral understanding of citizenship . . . that is embodied in the life of the citizen . . . reforging a language of political discourse that can articulate the . . . common good.³⁸

At the core of civic republicanism is the capacity of citizens to share in the act of governing.³⁹ Self-government, according to Sandel, requires citizens who identify sufficiently with political communities to think and act with a view toward the common good and political communities that *control* the individual destinies of their citizens.⁴⁰ Although this goal is daunting under modern conditions, Sandel believes it can be achieved, not by globalizing citizenship, but by dispersing sovereignty to a multiplicity of communities and political bodies, both upward and downward of the nation state—only by practicing citizenship in smaller public spheres, like those offered by schools, workplaces, places of religious worship, trade unions, and social movements, will citizens develop the virtues required for self-rule and loyalties to larger political wholes.⁴¹

37. Unlike Michelman and Sunstein, who primarily rely on the courts to make sense of and, where necessary, control the cacophonous strains of popular conversation, Sandel puts his entire faith in the political process. He sees in public institutions a means to gather people together and inculcate in citizens the habit of attending to public things. SANDEL, *supra* note 1, at 321. For a spirited critique of Michelman and Sunstein's civic-republican vision and a discussion of why participation in local government is the best way to encourage political discourse as well as moderation, see Kathryn Abrams, *Law's Republicanism*, 97 YALE L.J. 1591 (1988).

38. WILLIAM M. SULLIVAN, RECONSTRUCTING PUBLIC PHILOSOPHY 55 (1982), *quoted in* FOWLER, *supra* note 7, at 64. Sullivan calls for "a framework of institutionalized norms establishing and sanctioning the conditions of reciprocity." SULLIVAN, *supra*, at 35, *quoted in* FOWLER, *supra* note 7, at 69.

39. FOWLER, *supra* note 7, at 64.

40. According to Fowler, the republican vision of community is a polity where:

common good rules and public concerns triumph over the goals of the self-interested individual. The ideal is a place where citizens are united in public action and public spiritedness, reinforced by a rough equality, common respect, and basic human virtues, above all where "disinterested regard for the welfare of the whole . . . *civic virtue*," holds sway.

Id. at 63.

41. SANDEL, *supra* note 1, at 345-49. Abrams also favors dispersing sovereignty to local political institutions because they are highly visible, can be accessed easily, tap particularized norms that can become the basis for political action, share histories and traditions enabling citizens to grasp common norms more easily, and provide unique opportunities for exit. Like Sandel, Abrams suggests, for reasons of accessibility and identifiability, it may be useful to organize the institutions at the sublocal or neighborhood level (e.g., the city or neighborhood council) or to form them around the workplace. She argues that the plurality of local institutions makes it less likely that a given community's values will be seen as comprising "objective truth." Abrams, *supra* note 37, at 1605-06. *But see* Metro Broadcasting v. FCC, 497 U.S. 547, 566 (1990) (noting "as a matter of 'social reality and governmental theory,' the Federal Government is unlikely to be captured by minority racial or ethnic groups and used as an instrument of discrimination," while smaller political units like states and cities, because they pose heightened danger of oppression, warrant more intensive judicial review (quoting *City of Richmond v. J.A. Croson Co.*, 488 U.S. 469, 522 (1989) (Scalia, J., concurring))), *referenced in* Julian N. Eule, *Representative Government: The People's Choice*, 67 CHI-KENT L. REV. 777, 783 (1991).

The practice of politics is seen by civic republicans to be a “process in which private-regarding ‘men’ become public-regarding citizens and thus members of a people.” In other words, they transcend their individual existence to some larger meaning.⁴² To a civic republican, “politics means the discussion of alternatives by reference to a shared historical, cultural, political, and, ultimately, normative context.”⁴³ “Cultivating in citizens the virtue, independence and shared understandings such civic engagement requires is a central aim of republican politics”; indeed, Sandel calls such an aim a “formative ambition.”⁴⁴

Individualism (or liberalism) has not equipped citizens to supply modern political institutions with the moral authority that these institutions need to govern. Individualism separates and abandons citizens to such an extent that they can no longer understand that significant moral experience is not about a private autonomous being, unconnected to goals, traditions, or others, or to a stabilized order of value and life.⁴⁵ To Sandel, individualism leaves only the “un-encumbered self,” which neither describes nor promotes valuable things like character, self-knowledge, and friendship.⁴⁶ According to Sandel, strong community requires a communal “mode of self-understanding,” “fraternal sentiments and fellow-feeling,”⁴⁷ and creates citizens who are “situated” as opposed to “solitary” selves; the former being located in serious lives, communities, and ethical roles.

Despite the recent resurgence of interest in civic republicanism,⁴⁸ it is not a

42. Frank Michelman, *Law's Republic*, 97 YALE L.J. 1493, 1500 (1988). Michelman calls the process, which confers upon “its law-like issue the character of law binding upon all,” *jurisgenesis*. Jurisgenesis, according to Michelman, begins with a popular conversation, in which participants draw on features of their collective identity, expressed in narratives, analogies, and other professions of commitment, to answer questions about how they should live. *Id.* at 1513. The courts preside over these jurisgenesis popular conversations by assisting in the maintenance of the popular dialogue, but even more importantly by extracting from the dialogue themes that seem to the courts to be most consistent with their vision of community as it has evolved over time, particularly “the inclusionary commitment that may be overlooked by other participants, bringing into the community those at the margins whose differing views enrich its common like.” *Id.* at 1525. For a discussion and critique of Michelman's theories, see Abrams, *supra* note 37, at 1593-97.

43. Abrams, *supra* note 37, at 1593. For Sunstein, such discussions must include “a commitment to political empathy, embodied in a requirement that political actors attempt to assume the position of those who disagree”—what he calls “empathetic deliberations.” Cass R. Sunstein, *Beyond the Republican Revival*, 97 YALE L.J. 1539, 1555 (1988), *quoted in* Abrams, *supra* note 37, at 1601 (citation omitted).

44. SANDEL, *supra* note 1, at 274.

45. See generally MICHAEL J. SANDEL, LIBERALISM AND ITS CRITICS 6, 153 (1984), *quoted in* FOWLER, *supra* note 7, at 11-15; SANDEL, *supra* note 20, at 179-83.

46. Communitarians reject the concept of self because “[i]t generates a radical individualism and then a radical competition among self-seeking individuals.” WALZER, *supra* note 19, at 98. This competition among self-seeking individuals, in turn, makes it more difficult to move in the direction of an effective egalitarian and socially just society. Mark Tushnet, *Law and Group Rights: Federalism as a Model, in LAW AND THE COMMUNITY: THE END OF INDIVIDUALISM?* 277, 279 (1989), *referenced in* Addis, *supra* note 16, at 642.

47. SANDEL, *supra* note 20, at 150, *quoted in* FOWLER, *supra* note 7, at 4.

48. Fowler attributes the resurgence in republican thought to its restrained and chastened vision of communitarianism. “No wild ecstasy is associated with the idea; rather it offers a sober and modulated

vision without its critics. Sandel recounts some of those objections in *Democracy's Discontent*. For example, he writes, some believe his vision of community is too exclusive because it requires citizens to possess a certain excellence of character, judgment, and concern for the whole and that not every citizen possesses these virtues. To this reproach, he responds, "good citizens are made not found."⁴⁹ To the criticism that civic republicanism runs the risk of being coercive,⁵⁰ he responds by saying that his vision of the common good is more "clamorous than consensual."⁵¹ However, Sandel has more trouble rebutting another objection—that according political communities a stake in its citizens' character may result in bad communities forming bad characters—admitting that to be a "risk" of republicanism.⁵²

Sandel also worries that the republican tradition teaches that for every virtue there corresponds a characteristic form of corruption and decay. He identifies two such characteristics. The first corruption is a tendency toward fundamentalism, to shore up borders and harden the distinctions between insiders and outsiders.⁵³ The second is the possibility that the citizens of a republican polity may drift into a fragmented, storyless state, unable to interpret the conditions of the common life they share.⁵⁴ This corruption, Sandel appears to fear the most.

The loss of the capacity for narrative would amount to the ultimate disempowering of the human subject, for without narrative there is no continuity

image of community, promoted by chastened, responsible, public-spirited men and women." FOWLER, *supra* note 7, at 78.

49. SANDEL, *supra* note 1, at 319.

50. "The task of forging a common citizenship among a vast and disparate people invites more strenuous forms of soulcraft. This raises the stakes for republican politics and heightens the risk of coercion." SANDEL, *supra* note 1, at 319.

51. *Id.* Sandel responds to the accusation that civic republicanism is coercive by saying that his vision of the common good is not unitary, and that the public institutions that fill the gaps between people and gather people together in various capacities, both separate and relate them. *Id.* at 325. This concern, however, is more widely shared than some of the other critiques Sandel mentions. *See, e.g.*, Abrams, *supra* note 37, at 1591 (criticizing both Michelman and Sunstein's conceptualization of civic republicanism because their reliance on courts to mediate against the coercive strain of republican thought will not be as effective as local political institutions); Addis, *supra* note 16, at 648-58 (finding critical dialogic pluralism a more appealing construct than either individualism or communitarianism for minorities to express competing narratives while avoiding problems posed by the dilemmas of exclusion and assimilation); Onora O'Neill, *Practical Reason and Possible Community: A Reply to Jean-Marc Ferry*, 7 *RATIO JURIS* 308, 308-13 (1994) (critiquing communitarian reasoning to extent guided by improved idealized community whose numbers have been suitably reoriented). According to Abrams, Sunstein is particularly concerned about the "coercive power of shared norms," making him hesitant to prescribe an increase in mediation by substantive norms. Abrams, *supra* note 37, at 1607.

52. SANDEL, *supra* note 1, at 321. Sandel notes, however, that "dispersed power and multiple sites of civic formation may reduce these dangers but cannot remove them." *Id.*

53. *Id.* at 350.

54. *Id.* at 350-51. Addis might welcome this concern, for he thinks of societies (communities) as "narratives, 'struggle[s] for the privilege of recounting the past.'" Addis, *supra* note 16, at 649 (quoting David Luban, *Difference Made Legal: The Court and Dr. King*, 87 *MICH. L. REV.* 2152 (1989)). Addis sees in dialogic engagement the means by which groups become rearranged, recast, and reconceptualized, resulting in the dominant group no longer seeing their norms as neutral and universal. Addis, *supra* note 16, at 650-51.

between present and past, and therefore no responsibility, and therefore no possibility of acting together to govern ourselves.⁵⁵

With regard to both of these concerns he rests his hope on those among us who can “make sense of our condition and repair the civic life upon which democracy depends.”⁵⁶

Several strands of complexity theory are apparent in Sandel’s work. For example, Sandel’s proposal to disperse sovereignty to a multiplicity of overlapping and potentially conflicting political and social institutions introduces a *stochastic*, random element into his otherwise stable political system.⁵⁷ Sandel’s civic strand of freedom, the capacity to self-govern, in complexity theory might be called an *emergent property* of a complex system.⁵⁸ Sandel’s faith that debating communal values in dispersed social and political institutions will allow civic virtue (or order) to emerge is a demonstration of what complexity theorists, like Per Bak, would describe as an example of the *self-organized criticality*⁵⁹ of a nonlinear dynamical system, and others would refer to as *deterministic chaos*.⁶⁰ The capacity of individuals to become good citizens once they re-engage in the dialogic process of republican citizenship⁶¹ shows *adaptation*, an open-ended process in complexity theory by which a structure evolves through interaction with its environment to deliver a better performance.⁶²

However, in other ways, Sandel’s vision of community is the antithesis of what a complexity theorist would see; his assumptions about the behavior of political communities radically diverge from the lessons of complexity theory. It is to these points of divergence that this article now turns.

55. SANDEL, *supra* note 1, at 351.

56. *Id.*

57. *Id.* at 345. Sandel’s proposal resonates with the work of complexity theorist Stuart Kauffman on coupled systems models. For a more detailed discussion of Kauffmann’s work, see *infra* text accompanying notes 100-106.

58. COVENEY & HIGHFIELD, *supra* note 8, at 5. According to Coveney and Highfield, life is an emergent property that arises when physiochemical systems are organized and interact in certain ways, just as a human being is an emergent property of a large number of cells and a city is an emergent property of thousands or more human beings. *Id.* at 330. They also use the examples of a single water molecule not being able to express a swirling vortex in a turbulent ocean or a collection of brushstrokes conveying the whole of a Van Gogh painting to illustrate this point. *Id.* at 7.

Other examples of emergent properties found in Sandel’s civic republicanism might be his concept of community narratives which define a community’s character, purpose, and ends and are thus greater than the sum of the individual units that make up a community, or his assumption that the government should aim at a public good beyond the sum of private interests that make up the community. See SANDEL, *supra* note 1, 130-31.

59. See *infra* notes 92-94 and accompanying text.

60. See *supra* note 26 for a discussion of deterministic chaos.

61. The capacity for improvement seems implicit in Sandel’s belief in the educative process of civic engagement. SANDEL, *supra* note 1, at 5-6, 274. The process of “cultivating in citizens the virtue, independence, and shared understandings” necessary for self-rule is what Sandel calls the “formative project.” *Id.* at 128-33, 274.

62. COVENEY & HIGHFIELD, *supra* note 8, at 118-19. Coveney and Highfield go on to note that species caught up in the adaptive struggle are engaged in an attempt to solve a complex optimization problem by finding effective improvements to existing structures. *Id.*

The first lesson from complexity theory is that nonlinear dynamical systems must experience randomness to maximize self-sustainability and achieve optimized adaptation.⁶³ The highest average fitness of an individual agent (i.e., its ability to achieve optimized adaptation) in a complex system occurs precisely at the transition from order (stasis) to chaos (a zone or place known as the “region of complexity”).⁶⁴ Systems that can remain in the region of complexity are the most successful at enduring and withstanding the surprises their environment throws at them.⁶⁵ However, to achieve this level of self-sustainability, these systems must maintain a chaotic, random component.⁶⁶

[T]he emergence in environmental biology of the concept of unpredictable, dynamically changing ecosystems has injected a heightened awareness of the role of indeterminacy and randomness into evolutionary theory[,] . . . “ecosystem dynamics and pure chance have much to do with the fitness of species.”⁶⁷

Adaptation is an “emergent property” in a complex system that spontaneously arises through the interaction of simple components in that system. Adaptation allows complex systems to restructure or modify their interaction patterns to become more successful.⁶⁸ The most successful adaptations have

63. Ruhl, *supra* note 8, at 1416. The presence of chaos, emergence, and catastrophe in dynamic nonlinear systems means that small perturbations can result in large system changes, tending to amplify tiny differences, well below any error threshold one might see. *Id.* at 1441 n.140.

64. KAUFFMAN, *supra* note 22, at 230; Joseph H. Connell, *Diversity in Tropical Rain Forests and Coral Reefs*, 199 *SCI.* 1302, 1303-06 (1978) (noting that species diversity is often maximum at intermediate levels of disturbance), *cited in* William M. Lewis, Jr., *The Ecological Sciences and the Public Domain*, 65 *U. COLO. L. REV.* 279, 286 n.451 (1994).

65. Complex systems, although poised on the edge of chaos, are kept from falling into chaos by stability and simplicity (order revealed in the system’s global properties or behaviors). Ruhl, *supra* note 8, at 1410. Attractors are the behaviors that flow from the forces of order and disorder in complex systems and have the potential to regulate the surprise generators of chaos, emergence, and catastrophe. *Id.* at 1440. An attractor is a modelled representation of the behavioral results of a system which depicts where the system is going based on the rules of motion in the system. *Id.* at 1440 n.137. Attractors can be “fixed” and lend stability and predictability to a system, or they can be “strange” and lend flexibility and resilience to the system. Fixed attractors are brittle and crumble when faced with external forces of disruption while strange attractors are inherently unpredictable because of their susceptibility to surprise behavior. When a community of fixed and strange attractors is assembled in the proper balance (i.e., where chaos, emergence, and catastrophe are controlled by some countermeasures of order and repetition), the forces of order and disorder combine to allow a dynamical system to operate at “optimal adaptability.” *Id.* at 1441-42. The notion of attractors as the regulators of surprise in a complex system can be applied to explain how the communal behavior of citizens in a community can determine the community’s response to some unanticipated event. Complexity theory teaches that some balance of forces is necessary to enable the community to operate at its best under those circumstances.

66. Ruhl, *supra* note 8, at 1410.

67. *Id.* at 1434-35 (footnote omitted). For an examination of the tension between the stochastic nonequilibrium paradigm of complexity theory and existing environmental management strategies, see A. Dan Tarlock, *The Nonequilibrium Paradigm in Ecology and the Partial Unraveling of Environmental Law*, 25 *LOY. L.A. L. REV.* 1121 (1994).

68. Plants and animals evolve in order to refine various features. This refinement process is called adaptation, “a term used to designate any open-ended process by which a structure evolves through interaction with its environment to deliver a better performance.” Adaptive improvement is the way a

random elements within them which lead to innovation (i.e., the discovery of smart, unexpected solutions to very hard problems).⁶⁹

Adaptation is associated with feedback and feedforward loops made possible by multiple paths of interactions between system components.⁷⁰ Complexity theory teaches that simple systems (i.e., those with predictable behavior, few feedback/feedforward loops, and centralized decisionmaking that operate in accordance with easily understood computable rules) have difficulty adapting (i.e., the ability to absorb internal and external shocks, in complexity theory sometimes called “avalanches”),⁷¹ because they have few variables and, therefore, few interactions.⁷² By contrast, the feedback and feedforward loops made possible by complex system interactions enable such a system to restructure or modify the interaction patterns among its variables, opening up the possibility of a wider range of behaviors and a greater probability of successful adaptations.

Randomness in a social or political community can be found in the identity of the group that forms that community. Group identities are constructed relationally and, therefore, are contingent and unstable.⁷³ As Angela Harris says,

[W]e are not born with a “self,” but rather are composed of a welter of partial, sometimes contradictory, or even antithetical “selves.” A unified identity, if such can ever exist, is a product of will, not a common destiny or natural birthright.⁷⁴

The process of forming an internal and external identity in a group setting, therefore, is dialogic or interactive and complex.

Reducing the concept of community down to its simplest form, to the smallest minimum unit of common or shared values, experience, and history, substantially reduces the likelihood of random events occurring and the likelihood of successful adaptation (finding smart solutions to hard problems) of that community.⁷⁵ It may also mean that the very act of character formation that is

species survives the “biological arms race.” COVENEY & HIGHFIELD, *supra* note 8, at 118. Coveney and Highfield make the additional point that evolution is a property that belongs not just to a single individual or gene, but to a whole system, and thus points us away from isolated units (individuals or genes) and towards interactions between individuals and their environment. *Id.* at 194.

69. *Id.* at 16.

70. Ruhl, *supra* note 8, at 1442 n.150.

71. See *infra* note 93 and accompanying text.

72. JOHN L. CASTI, COMPLEXIFICATION: EXPLAINING THE PARADOXICAL WORLD THROUGH THE SCIENCE OF SURPRISE 271-72 (1994), *quoted in* Ruhl, *supra* note 8, at 1440 n.139.

73. Addis, *supra* note 16, at 655. Addis also points out that group identities are constructed rationally, and that with regard to ethnic groups, those identities are constituted and sustained, in part, as a result of outsiders’ perceptions of the existence of the group, making the narrative of others as well as the narrative of the group part of what defines the ethnic group. *Id.* at 655-56 n.99.

74. Angela P. Harris, *Race and Essentialism in Feminist Legal Theory*, 42 STAN. L. REV. 581, 584 (1990), *quoted in* Addis, *supra* note 16, at 655 n.98.

75. This view of communal life is diametrically opposed to that offered by Addis and reflected in his preference for critical dialogic pluralism. Addis, *supra* note 16, at 67; see also Beryl Blaustone, *Myth:*

central to civic republican thought cannot occur because the circumstances under which adaptation takes place are not present.⁷⁶

The lack of randomness in a republican community may also explain its drift toward fundamentalism. Sandel admits that republicanism can lead to tight boundaries around core cultural values that exclude unlike from like or limit individual choice in the quest for consensus.⁷⁷ He compensates for this tendency toward fundamentalism (*stasis*) by having citizens debate civic values in many separate communities, not by introducing diversity into those communities. However, whatever randomness results from this process will be confined to the individual, as it is she, not the political community in which she is participating, that will experience the chaos and indeterminacy created by these multiple engagements.

Under complexity theory, therefore, the republican community will experience *stasis* (fundamentalism) and never reach the region of complexity.⁷⁸ By contrast, Addis's "critical dialogic pluralism," in which minorities directly engage the majority in debates over cultural norms, forces the majority (likes) to stop seeing their norms as universal and to rearrange, reconceptualize and recast their identity as the dominant group. This dialogic process wards off *stasis* (fundamentalism) and moves the political system or community into the desired region of complexity.⁷⁹

Complexity theory validates the republican search for order in a chaotic universe. It finds the potential for that order in a system's *emergent properties*,

The Conflicts of Diversity, Justice and Peace in the Theories of Dispute Resolution, 25 U. TOL. L. REV. 253 (1994) (noting that the distinct, diverse peoples of the world all have essential or core portions of human knowledge, and discovery of a complete body of knowledge is possible only by engaging in interaction with diverse peoples).

76. COVENEY & HIGHFIELD, *supra* note 8, at 332 (study of complexity shows importance of diversity and randomness in sustaining capability for adaptive innovation).

77. The participatory democracy that Sandel advocates may not be the best mechanism when substantive disagreement occurs as it may generate more pressure to conform than might be wished for or expected. FOWLER, *supra* note 7, at 152-53; *see also* Lynn Baker, *Direct Democracy and Discrimination: A Public Choice Perspective*, 67 CHI.-KENT L. REV. 707 (1991) (advocating plebescites as best protection for minorities); Eule, *supra* note 41, at 777 (critiquing Baker's support of plebescites, finding instead best protection for minorities in representative government); Martha Minow, *Justice Engendered*, 101 HARV. L. REV. 10, 92 (1987) (stating "even when we understand them, some voices will lose").

78. The "mantra" of community quiets and calms, "it leads away from the conflicts inherent in politics." FOWLER, *supra* note 7, at 152. Rejecting this view of community, Addis writes that good society does not eliminate or transcend group differences. He sees society, instead, as "a constant and desirable mutual interrogation of various narratives." Addis, *supra* note 16, at 649.

79. Addis, *supra* note 16, at 650-51. According to Robert Cover, dialogue will enable social groups to accommodate in their own normative world the objective reality of the other, resulting in dominant groups understanding how it feels to be oppressed or excluded. Robert Cover, *The Supreme Court Term, 1982-Foreword: Nomos and Narrative*, 97 HARV. L. REV. 4, 28-29, *cited in* Addis, *supra* note 16, at 650-51. Sunstein calls for "empathetic deliberation," in which political actors attempt to assume the positions of those who disagree with them, and he identifies "universality" (the possibility of mediating different approaches to politics and the conceptions of public good through discussion and dialogue) as one of four features of republicanism. The other three are deliberation (laws must be supported by argument and reason), equality of political actors (they must justify choices by appealing to a broader public good), and citizenship. Sunstein, *supra* note 43, at 1544-99.

those properties that transcend a system's individual component parts. Civic virtue could be called an *emergent property*. However, complexity theory also reveals why surprises are inevitable when dealing with nonlinear dynamical systems, why these surprises are not predictable under any reductionist mode of thinking,⁸⁰ and why dynamical systems, like political communities, must have a random element in them to adapt successfully to a stressful, changing fitness landscape.⁸¹ Randomness is not a feature of a civic republican community; this missing factor raises questions about the viability of the republican polity on the political fitness landscape.

There are other concepts from complexity theory, especially from the branch called evolutionary biology, that may shed additional light on our inquiry into the viability of Sandel's civic republican community. The first is that ecosystem nonequilibrium dynamics recognizes that the "[f]itness landscapes of various species in the ecosystem are coupled by their temporal interactions, requiring that all species reconstruct their schemata and structures continually."⁸² In other words, as one species evolves it changes the fitness landscapes of the other species with which it interacts.

Evolutionary biologists use two models to show how species cope with other species' evolution.⁸³ The first of these is competition. Competition can lead to character displacement, the evolution of two species away from each other, or full competitive exclusion (extinction).⁸⁴ The second model is cooperation.

80. According to Wilson, even the chance occurrences of genetic transmission ("random drift") "do not always support evolution of a phenotype into the normatively fittest species through exploitation of selective differences, nor do they necessarily have anything to do with environmental pressures. Some component of evolution is 'pure chance.'" Ruhl, *supra* note 8, at 1431 (referencing WILSON, *supra* note 8, at 81 (discussing genetic drift)). Wilson goes on to explain the phenomenon of "founder effect" which is used by some evolutionary biologists to explain how new species are formed more quickly than one might otherwise suppose. Wilson explains how the accident of the genetic composition of the founder population, which may be different from the parent population by pure chance, coupled with the founder population's small size and geographic isolation, as well as the environmental exigencies of a new and different environment, might propel populations into new ways of life (i.e., new adaptive zones) and lead those populations to construct reproductive barriers, gaining for themselves full species status. As can be seen by Wilson's explanation, pure chance plays an important role in the process, but note also the introduction of the notion of barriers to enable a species to self-define itself to the point of survival. WILSON, *supra* note 8, at 81-84.

81. For an explanation of the term "fitness landscape," see *supra* note 31.

82. Ruhl, *supra* note 8, at 1463. Ruhl goes on to explain that this change to the fitness landscape introduces a new element, time, into the fitness question which complexity refers to as "coupling." According to complexity theory, the fitness landscapes of various species in a complex system like an ecosystem are coupled together by their temporal interactions, requiring all species in that system to reconstruct their schemata or structures continually, in what Ruhl calls "a sort of perpetual exercise in game theory." *Id.* Ruhl illustrates this point by analogizing to repeated playings of the Prisoners' Dilemma Game, in which the participants gradually come to understand the coordinated nature of their choices. *Id.* at 1463 n.216.

83. *Id.* at 1463-64, 1464 n.221, citing MURRAY GELL-MANN, *THE QUARK AND THE JAGUAR: ADVENTURES IN THE SIMPLE AND THE COMPLEX* 242 (1994) (stating that "[a]lthough competition among schemata is a characteristic of complex adaptive systems, the systems themselves may indulge in a mixture of competition and cooperation in their interactions with one another").

84. According to Coveney and Highfield, "complexity in nature has been refined by competition for finite resources." COVENEY & HIGHFIELD, *supra* note 8, at 11.

Cooperation is revealed through the mechanism of ecological displacement, in which one species yields a part of its environment to another. Cooperation allows more species to be accommodated in a given ecosystem than competition. This means that the overall biodiversity of that system will rise and bring the ecosystem closer to the desired region of dynamical complexity.⁸⁵ Both competition and cooperation in some shifting relationship exist in evolving dynamical systems.

Addis's critical dialogic pluralism, in which minority groups can tell competing narratives to those told by the majority and through which group norms and identities get rearranged, recast and reconceptualized,⁸⁶ seems closer to the competition model of evolutionary biology, while Sandel's vision of communities involving "fraternal sentiments and fellow-feeling," as well as a "communal mode of self-understanding," seems closer to the cooperative model.⁸⁷ Evolutionary biology teaches that an evolving dynamic system like a political community requires both.

A second useful insight from evolutionary biology is the concept of dynamic coevolutionary change through which a system adds and deletes species as needed to enable it to continue to exist on the edge of chaos.⁸⁸ Occasionally, even the fittest species in a particular ecosystem may need to jump out of its niche⁸⁹ (i.e., take a risk) in order to survive its changing fitness landscape; in doing so, as noted previously, it changes the fitness landscape for both the species that remain behind and for the species in the new terrain.⁹⁰ Some jumps fail and species go extinct; others succeed. For species to survive in such a complex game they must remain elastic.⁹¹

The term used in complexity theory to describe the elasticity of system

85. Ruhl, *supra* note 8, at 1463-64 (citing WILSON, *supra* note 8, at 170-72) (discussing "assembly rules"). "Assembly rules" of an ecosystem are a combination of "adaptive radiation" (spread of a species of common ancestry into different niches in the same ecosystem) and "evolutionary convergence" (occupation of the same niche in different ecosystems by different species). Ruhl, *supra* note 8, at 1434-35.

86. Minority story-telling serves a "strategic function as an oppositional counter-hegemonic activity." Addis, *supra* note 16, at 645 n.79; see also Richard Delgado, *Story-Telling for Oppositionists and Others: A Plea for Narrative*, 87 MICH. L. REV. 2411 (1989).

87. SANDEL, *supra* note 20, at 150.

88. The landscape furnished by the "fitness measure" depends not only on the properties of one species, but also on the performance of rival organisms in a changing landscape. COVENEY & HIGHFIELD, *supra* note 8, at 121.

89. A niche is "the place occupied by a species in its ecosystem—where it lives, what it eats, its foraging route, the season of its activity, and so on. In a more abstract sense, a niche is a potential place or role within a given ecosystem into which species may or may not have evolved." WILSON, *supra* note 8, at 403.

90. Ruhl, *supra* note 8, at 1465.

91. *Id.*; see also WILSON, *supra* note 8, at 172-76 (stating that "closely similar species can fit together when their requirements are elastic"). Wilson goes on to explain the extent to which anatomically similar finches have changed their eating habits, with some becoming specialists and others broadening their diet in response to food scarcity during the dry season. He also explains how this evolutionary change, called character displacement, can cause first phenotypic differences between two anatomically similar species and then physiological and anatomical changes in those species.

components and of whole systems is *self-organized criticality*.⁹² Self-organized criticality says that a mature complex adaptive system evolves toward a critical state (the edge of chaos) and once there devises ways to avoid experiencing so many avalanches (shocks) by integrating numerous smaller avalanches as release valves.⁹³ Self-organized criticality exists at every level of living systems.⁹⁴

Elasticity (or self-organized criticality), the ability to jump from peak to peak, to be nonrisk averse, is essential for the survival of individual species. In Sandel's theory perhaps, elasticity can be found in what he calls the modern republican civic virtue, the capacity to negotiate our way among the sometimes overlapping and sometimes conflicting obligations that claim us, and to live with the tension to which multiple loyalties give rise (i.e., to learn to act as multiply situated, encumbered selves).

But, there is another lesson to be learned from elasticity (or organized criticality). Per Bak teaches that *too much* codependence (encumbrance) in complex dynamical systems can lessen a species' elasticity (i.e., its ability to survive shocks to the system in which the species lives).⁹⁵ His work shows that complex species with many biological connections and dependencies (e.g., food chains, predator-prey, and parasite-host relationships) are more sensitive to fluctuations that disturb the dynamics of their system, and thus are more likely to be part of the next "avalanche to extinction."⁹⁶ Species in such a system influence each other to the point of functioning like a single "metaorganism," increasing the likelihood that all the species in the system will share the same

92. According to Coveney and Highfield, "[m]atter has an innate tendency to self-organize and generate complexity." COVENEY & HIGHFIELD, *supra* note 8, at 10. A defining feature of complexity is the fact that self-organization is a natural consequence of evolution over time of vast aggregates of simple agents (e.g., molecules in a liquid). By making individual agents act in a more complex way, an even greater variety of behaviors can be created so long as the agents interact nonlinearly and operate under far from equilibrium conditions. *Id.* at 189. Coveney and Highfield also discuss Per Bak's work at Brookhaven National Laboratory with sandpiles to demonstrate the existence of a self-organized critical state. *Id.* at 185-89. The existence of a self-organized critical state, which shows the connectedness of phenomena based on the activity of many individual agents, has been used to explain the evolution of earthquakes and the distribution of their epicenters. According to Coveney and Highfield, self-organized criticality may even explain periods of global conflicts and social unrest and how information propagates through the brain. *Id.* at 187-89.

93. Ruhl, *supra* note 8, at 1465. According to Per Bak, life is a dynamical system that, far from ever existing in a steady state (equilibrium), organizes spontaneously into a characteristic and much more critical state in which catastrophes (avalanches) of any size can be a self-organizing feature of evolution requiring no external cause. COVENEY & HIGHFIELD, *supra* note 8, at 232.

94. COVENEY & HIGHFIELD, *supra* note 8, at 194. Coveney and Highfield cite as an example of this principle, the double helix of DNA. *Id.* Per Bak's notion of self-organized criticality and the idea of punctuated equilibria (a theory developed by evolutionary biologists and mathematicians to explain discontinuities in the fossil record) contradict the Darwinian model of gradual vertical evolution. Ruhl, *supra* note 8, at 1428-29.

95. Per Bak et al., *Can We Model Darwin?*, NEW SCIENTIST, Mar. 12, 1994, at 36, *quoted in* COVENEY & HIGHFIELD, *supra* note 8, at 233-34. According to Bak's model, at the critical point of evolutionary activity all species influence each other, transforming themselves from individuals into a single metaorganism, leaving themselves (unencumbered) vulnerable to sharing the same ecological fate. COVENEY & HIGHFIELD, *supra* note 8, at 234. This is why, according to Bak, (unencumbered) cockroaches will outlive humans. *Id.*

96. COVENEY & HIGHFIELD, *supra* note 8, at 234.

fate, as in the case of mass extinctions.⁹⁷

Sandel's proposal, like Jefferson's before him, to proliferate the sites of civic activity and political power may indeed generate loyalties to a larger political whole and offer "a way of cementing the whole by giving each citizen a part in public affairs."⁹⁸ However, his multiply situated self may be too encumbered with communal identities and mores to take risks, to jump from a communal peak, or to leave a niche that no longer provides the conditions suitable for optimized adaptation. Such a metaorganism, which is totally dependent for character formation on dialogic exchanges in various communities, Bak shows, is vulnerable to mass extinction. Some measure of individualism, the capacity to choose our values and ends for ourselves—the disparaged "unencumbered self"—therefore, may be necessary to preserve the elasticity necessary to negotiate the peaks of the political fitness landscape.⁹⁹

Another insight into the effects of Sandel's proposal to disperse sovereignty to multiple social and political institutions can be gleaned from complexity theorist Stuart Kauffman's quilt of nonoverlapping patches. Kauffman shows that flatter,¹⁰⁰ decentralized organizations—ones that are broken "into 'patches' where each party attempts to optimize for its own selfish benefit, even if that is harmful to the whole"¹⁰¹—might actually be more flexible and carry an overall competitive advantage.¹⁰² Such a structure, according to Kauffman, "can lead, as if by an invisible hand, to the welfare of the whole organization."¹⁰³ This happens because of the coupling (interactions) between parts in two patches across patch boundaries. The effect of coupling is that finding a good solution to a problem in one patch (i.e., optimization) changes the problem to be solved by the parts in adjacent patches—an evolutionary, dynamic process that continues across the entire system or quilt of patches until the highest average fitness (optimized adaptation) is achieved across the system.

Coupled landscapes (i.e., those with many constraints) contain many moderate peaks, revealing no obvious solution. Coupled landscapes are difficult to traverse.¹⁰⁴ As coupling increases, life becomes more chaotic; as coupling decreases, life becomes more rigid.¹⁰⁵ Hard conflict-laden problems containing

97. For a more detailed explication of Per Bak's work, see *id.* at 232-34.

98. SANDEL, *supra* note 1, at 348.

99. For a more detailed discussion of the evolutionary result of "adaptive radiation" (spread of species of common ancestry into different niches) and "evolutionary convergence" (occupation of the same niche by products of different adaptive radiation), see WILSON, *supra* note 8, 93-139.

100. Flatness, in complexity terms, means an organization designed around a fitness landscape without many high peaks and low valleys. KAUFFMAN, *supra* note 22, at 247, *cited in* Ruhl, *supra* note 8, at 1469.

101. *Id.*

102. *Id.* at 246, *cited in* Ruhl, *supra* note 8, at 1469.

103. *Id.*

104. *Id.* Another way of understanding coupling is to think of it as the inputs from other components in a system that each individual component needs in order to know what to do next in the system. *Id.* at 173, *cited in* Ruhl, *supra* note 8, at 1450 n.172.

105. *Id.* at 247-52, *cited in* Ruhl, *supra* note 8, at 1470. Kauffman's work with coupled system

many constraints (i.e., couplings), like governing, in which many parts interact, Kauffman suggests, can be solved by breaking the problem into smaller, nonoverlapping patches—a process that can continue until the desired region of complexity (between order and chaos) has been achieved, where patch size is intermediate and coupling is just enough to avoid rigidity on the one hand, and spiraling into chaos on the other.¹⁰⁶

By suggesting that the hope for self-government in America today lies in the politics of neighborhood (de Tocqueville's townships), Sandel is proposing to divide the hard problem of civic engagement (governing) into smaller patches.¹⁰⁷ Sandel's proposal to disperse sovereignty into ever smaller social or civic institutions and to form citizenship across multiple sites of civic engagement may, however, be reducing the patch size too much; his multiply situated citizens may be too encumbered, engaged in too many interactions between patches (too coupled or constrained) to gain the full benefit of Kauffman's patch procedure.¹⁰⁸ Sandel's political fitness landscape, thus, contains too many moderate peaks, making it difficult to cross, presenting no obvious solution to the hard problem of governing. Sandel needs to think further about what patch size and amount of coupling between patches will achieve the highest average fitness across the political system. Kauffman's work suggests that Sandel may have too quickly abandoned local government and municipal institutions in favor of smaller political spaces.¹⁰⁹

This article suggests that complexity theory has something to teach us about the behavior of political systems and can offer both a critique of the republican vision of community and a means to correct or refine that vision.¹¹⁰ Complexity theory demonstrates why complex systems like political communities are unstable by design, and that surprise, randomness, diversity, and even deterministic chaos are necessary for the system to thrive and adapt in a dynamically fit manner to a changing fitness landscape—in other words, to survive. Sandel's republican community has been carefully constructed to avoid surprise and thus has a lower likelihood of survival in our evolving political landscape. Complex-

modules shows that as the number of interactions (coupling between individual species) increases, the heights of fitness peaks decrease and their numbers increase, and evolving over the landscape becomes more difficult. *Id.* at 173, cited in Ruhl, *supra* note 8, at 1450 n.172.

106. *Id.*

107. Sandel notes with approval de Tocqueville's observation that "[p]racticizing self-government in small spheres . . . impels citizens to larger spheres of political activity," and Jefferson's desire to divide counties into wards, local self-governing units that would permit direct political participation. SANDEL, *supra* note 1, at 347.

108. *Id.*

109. *Id.* at 348.

110. Coveney and Highfield note that the social structures constructed by human societies are complex as well as open and linear and ones in which feedback and competition abound. They discuss ways in which complexity theory can be used to model the growth of urban sprawl and the effects of population movements, and how the crisis points associated with self-organization and chaos that occur in inanimate processes can be used to understand the phenomena of revolutions and breakdown in civil order. COVENEY & HIGHFIELD, *supra* note 8, at 357-58.

ity theory also suggests that adding diversity to the republican community may provide the conditions for character formation that civic republicans seek and that dispersing power downwards from the nation-state may indeed provide a more optimal fitness landscape for the hard job of governing, so long as the sphere of civic engagement is large and unconstrained enough to harbor the necessary quotient of complexity for it to survive.

However, complexity theory also shows the pitfalls of reductionist thinking. Reductive thought seeks to explain complex phenomena in terms of something simpler, generally by splitting these phenomena up into their smallest possible pieces.¹¹¹

There is no simple algorithm to turn to. Instead, we must try to understand the world in more global terms, through the *interactions* between its components. Instead of attempting to take a deterministic, mechanical view of the world, we need a higher-level perspective if we are to make sense of it.¹¹²

In many ways, civic republicanism is a search for a simple algorithm, a simple solution for solving democracy's discontent that seeks to quell the complexities brought about by the pluralism inherent in a democratic state.¹¹³ The preoccupation of civic republicanism with the character of individuals in political communities (the smallest individual unit in a dynamic nonlinear system), even though that character is contextualized in a communal setting, and Sandel's proposal to disperse political power into ever smaller homogeneous groupings of individuals is quintessential reductionism. It is the antithesis of complexity theory, with its focus on emergent or global properties and its study of the whole rather than individual parts.

The search for the simple solution (or algorithm) can be very seductive.¹¹⁴ That solution, once found, can function like a meme, a unit of cultural transmission that propagates from brain to brain, much like a craze for pogo sticks or slinkies sweeps through a school.¹¹⁵ Perhaps civic republicanism is functioning like a meme in the last part of the twentieth century, which complexity theory can slow down by teaching us that simple solutions are not only difficult to come by, but not necessarily the best solutions, once found.

111. *Id.* at 11-12. Coveney and Highfield go on to illustrate what they see to be the tension between reductionism and complexity by discussing the human brain, the functioning of which depends on both its microscopic cellular and subcellular detail, and its macroscopic emergent properties like consciousness and emotion. *Id.* at 16. Professor Kaufman's theory of patches, although it relies on dividing hard problems into smaller parts, is not reductive thought, because it does not seek to divide the problem into its *smallest* part, only to the point where the region of complexity can be reached. Ruhl, *supra* note 8, at 1470.

112. COVENEY & HIGHFIELD, *supra* note 8, at 330.

113. According to Walzer, both individualism and communitarianism have the itch "for singularity and unity, as if these two might provide a relief from moral anxiety, an end to striving, and therefore a kind of completion." WALZER, *supra* note 19, at 226.

114. COVENEY & HIGHFIELD, *supra* note 8, at 11-14.

115. "Fashions and crazes succeed each other, not because the later one is more correct or superior to earlier ones, but simply as any epidemic hits a school." Richard Dawkins, *Is Religion Just a Disease?*, THE DAILY TELEGRAPHY, December 15, 1993, *quoted in* COVENEY & HIGHFIELD, *supra* note 8, at 334.