CHAPTER 16

POLICY DYNAMICS

EUGENE BARDACH

Understanding dynamics is about understanding change, and a concern with policy dynamics has to be, in some measure, about policy change—how to get from here to there in the political process. This concern should be focused on both policy-making and policy-implementing processes. Consider the following questions that call for answers framed at least partially in dynamic terms:

- The federal welfare reform Act[1] of 1996 was something of a backlash against an unpopular program that was seen as encouraging dependency. But was it also:
  - An equilibrating move in a political system that tends to seek the ideological center?
  - An evolutionary move towards economic efficiency that either does or does not have a built-in tropism towards efficiency?
  - A product of successful long-term "learning" processes in the policy-making system?
- Why can't the United States seem to get a rational health care system that provides reasonable quality care at reasonable cost to all Americans? Perhaps one reason is that the dynamics of policy development in this area, begun in the 1930s, have locked us in to a system that depends heavily, but also only partially on employer-based financing.
- Regulatory agencies are often said to become captured by the industries they regulate. How does the process of becoming captured unfold?
- How did the United States Congress come to be such a polarized body? It was not always this way, and the process took place over many years. How did the

[1] Formally known as the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA).

process work? Is the process specific to this institution and its historical context(s), or is the process, at least in part, more generic?

- An entrepreneurial group of legislative staff and legislators with close ties to the powerful Speaker of the California Assembly sought the Speaker's assistance for a major reform in mental health policy only in the closing days of the legislative struggle. Why did they wait? Might they have been better off not waiting so long?

While this chapter does not attempt to answer these questions in particular, it does seek to describe and evaluate a number of conceptual frameworks for answering questions like these.

1. Overview

This is not a review essay on the status of a mature field. It does not try to summarize comprehensively the works of others. The study of policy dynamics is not a field at all; and, to the best of my knowledge, no one has previously brought together all the phenomena I canvass here. I have scanned for work in which dynamics and policy both happen to be present, even if the authors did not self-consciously intend to make the connection. I have also not aimed to eliminate subjectivity on my part. Scanning is bound to be subjective, perhaps idiosyncratic, as is interpretation of the results.

My main objective is to stimulate research interest in a neglected phenomenon and, by way of doing so, to present concepts and substantive hypotheses that I have found stimulating or that others might find so.

The most important others are the likely readers of this *Handbook*. I assume the average reader to have a generalist's interest in the policy process. Hence, I have favored breadth over depth. Secondly, I have focused more on the institutional dynamics of the policy-making process than on the evolution of substantive policies themselves, though obviously the two subject matters overlap. This focus has naturally led me to look primarily to the work done by political scientists, though I also mention stimulating contributions by economists and other social scientists.[2] Thirdly, I have tried to point to policy-relevant applications of leading ideas in the study of dynamic social systems, even though such applications are often isolated, pioneering, and not necessarily widely cited by students of the policy process. Fourthly, I occasionally refer to studies or bodies of work that, although not closely related to the policy process, suggest the power of certain approaches to the study of dynamic systems.

[2] I am, of course, indebted to the work of Baumgartner and Jones, who have presented a survey on these topics as well (Baumgartner and Jones 2002).

In Section 2, I explain some key concepts in systems analysis that are necessary for understanding dynamics.

Section 3 deals with dynamic processes dominated by negative feedback. They are in some sense equilibrating, or balance seeking. However, in most cases equilibrium is not actually achieved, unless one is willing to call oscillating within some broad or narrow range an equilibrium. They all have to do with what one might think of as "the balance of power."

Section 4 discusses processes dominated by positive feedback. These are the more integrative processes of political life, e.g. consensus building, network construction, community mobilization, collective learning, interorganizational collaboration.

Section 5 briefly describes dynamic processes that unfold in only one direction. That is, they do not involve feedback loops. The processes selected here for discussion involve filtering and chain reactions, or "cascades."

Section 6 concludes with a short wish list for future research.

1.1 Do Dynamics Matter Anyway?

As this chapter is devoted exclusively to policy dynamics, it would be easy for both author and reader to be carried away by the putative importance of dynamic processes and process-related tactical skills relative to, say, institutionalized authority or interest group power or interpersonal influence. The conceptual fascination of the subject matter, and some of the exotic models to deal with it, increases the temptation. Not all scholars working in this area have been immune. We should probably believe, though, that in the end, authority, power, and influence all matter more. If you are wrestling Hercules, you will lose eventually, no matter what the sequence of holds and escapes along the way. The assumption behind this chapter is merely that *when* process dynamics are consequential, we need the conceptual tools and empirical knowledge for understanding them.

2. "Systems" and "Dynamics"

Not all systems are dynamic, but all dynamics occur within systems. We must therefore say something at the outset about how to understand systems.

Robert Jervis, in *System Effects: Complexity in Political and Social Life*, provides this useful definition of a system: "We are dealing with a system when (a) a set of units or elements is interconnected so that changes in some elements or their relations produce changes in other parts of the system, and (b) the entire system exhibits properties and behaviors that are different from those of the parts" (Jervis 1997, 6).

A closed system is one that is responsive only to changes initiated by its own elements; an open system contains an endogenous core that behaves in many ways like a closed system but can also receive inputs from its environment. In this chapter, I consider only open systems but often focus mainly on the dynamics of their endogenous cores.[3]

To convey the flavor of what counts as what, in Terry Moe's paper on the dynamics of the National Labor Relations Board (NLRB), the endogenous core consists of the Board, the staff, and the millions of employers and workers who are potential complainants, whereas the environment is composed of political officials, judges, and a variety of economic conditions (Moe 1985). In Moe's analysis of who wins and who loses at the NLRB, the workings of the endogenous core have an interesting but minor influence compared to influences from the larger environment. Exogenous influences on the Board, especially by way of presidential appointments, importantly shift its pro- or anti-labor tilt. Then endogenous dynamics take over. Suppose, for instance, the Board shifts its interpretative standards in a direction favorable to labor. This leads to a temporary increase in the win rate. But this increase is only temporary. As the backlog of cases to be settled favorably to labor under the standards diminishes, so too does the average win rate. But the temporarily above-average win rate, in combination with signals about the Board's new interpretative standards, encourages an increase in labor filings. The average quality of the new filings is below the average quality of the old caseload, however, and the win rate at the staff level (as they filter cases up to the board) drops. As staff criteria and labor perceptions of those criteria stabilize, the average merit of cases and the labor win rate converge on some "normal" level. This new level, though, is more pro-labor than it used to be before the shifts in the Board's composition.

2.1 Negative and Positive Feedback Loops

The structure of a system consists of (1) its constituent elements, (2) the rules governing their interactions, and (3) the information required by the system to apply the rules. In virtually all dynamic systems of interest to students of policy, "running" the system creates feedbacks that might alter the structure of the system.

By means of feedback loops certain system outputs (whether intermediate or final) influence certain of the system's inputs. For instance, teachers encourage parents to read to their children, and the children's improved performance encourages parents to keep up the good work. The literature on systems dynamics calls such growth-inducing feedback loops "positive" because in conventional loop diagrams such as

[3] Richardson usefully distinguishes two meanings, analytical and material, of "closed" system. In a material, or real, sense all systems are open. For analytical purposes, however, it sometimes makes sense to treat certain systems as closed. Jay W. Forrester, a pioneer of at least one wing of contemporary systems analysis, works only on analytically closed systems (Richardson 1991, 297–8).

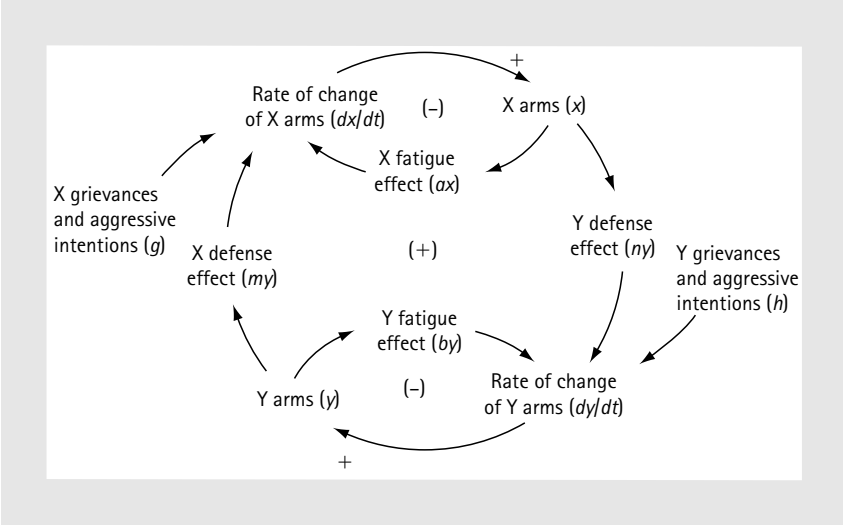

Fig. 16.1. Loop structure of Richardson's linear model of an arms race

Fig. 16.1 the product of the components' polarities is positive. "Negative" feedback loops, on the other hand, have balancing, or equilibrating effects, as the product of the polarities is negative. Figure 16.1 diagrams the well-known arms race model of Lewis Richardson. Richardson's algebraic model is given in equations (1) and (2), with x and y representing stockpiles of arms in two nations, m and n being positive "defense" coefficients, and g and h representing "grievances" or "aggressive intentions" (Richardson 1991, 40).

$$dx/dt = my - ax + g \tag{1}$$

$$dy/dt = nx - by + h \tag{2}$$

In the NLRB case, a larger gap between cases filed and cases won increased worker realism, while increased realism fed back and decreased the gap.

2.2 "Emergent Properties" and "Developments"

As they run, most complex systems with positive feedback loops create new features, "emergent properties." In the physical world, think of a pot that miraculously emerges from the system of clay, wheel, and potter. In the social world, think of gridlock that emerges from thousands of drivers converging on the same highways or urban streets. As these examples suggest, emergent properties are properties of the system as a whole rather than any of its component parts.

"Emergent properties" can loosely be translated back into more conventional language as "developments." In the course of this chapter I shall refer to many

such developments in policy-related systems. I have already mentioned win rates in the NLRB case. Other such examples will be:

- Partial fragmentation of an advocacy coalition following soon after countermobilization by its opponents.
- The emergence of a functioning "interagency collaborative" out of a combination of human and non-human assets hitherto relatively independent of one another.
- A variety of momentum processes that go into the creation of electoral bandwagons, the construction of implementation networks, and the development of legislative consensus.
- The "lock-in effect" that comes to hem in social policy by all the policies previously enacted and with which any new policy must be reconciled.

3. Negative Feedback Processes: The Balancing of Power

I discuss two types of negative feedback, or equilibrating, processes. They are:

- Oscillations occurring within certain—perhaps changeable—limits.[4]
- Efforts being made to maintain a "monopolistic" equilibrium condition, one based on the superior political power of the monopolists. When reformers do manage to succeed, this might be termed a "disequilibrating" process.

I will note preliminarily that I ignore the large domain of processes that either do or might reach a game-theoretical equilibrium. Many of these, such as the Prisoner's Dilemma game, are of great relevance to policy making and implementation and have inspired a large literature. The reason for this omission is that equilibration in these games, if it occurs, is instantaneous; hence, there is no "dynamic" to talk about. For the same reason I also omit effects that compensate for failures to reach an equilibrium, such as discussed in Miller (Miller 1992).

3.1 Oscillating Processes

Before turning to domestic policy processes, our main interest, let us consider the classic oscillating system, balance of power politics in the international arena. At its

[4] In their generally thorough and insightful work on both positive and negative feedback, Baumgartner and Jones refer occasionally to the "homeostatic" role of negative feedback (Baumgartner and Jones 2002, 8–9). This implies a return to some prior defined state. I do not think this occurs very frequently. All I attribute to negative feedback is system movement in a reactive direction.

core, the process features (1) the rise of a countervailing coalition to challenge any emerging coalition of states and (2) fluidity in coalition formation, so that today's enemy may be tomorrow's ally. The system oscillates between relative peace and near-war, sometimes tipping over into actual war when countervailing threat fails to deter. However, it also tends to preserve most actors' territorial integrity and bars the way to successful total domination (Jervis 1997, 131–3).

Whether or not one thinks the balance of power actually "works"—in Renaissance Italy or in Europe, say, from the seventeenth century until the Second World War—it is clear that it does not work all the time. When rulers are extremely ambitious or miscalculate, or countervailing forces are slow to mobilize, the system will break down. That is, war will occur. These failures do not arise from the dynamics of the system's endogenous core, however, but from exogenous forces in the system's environment, such as leaders' psychology (Napoleon, Hitler) or the influences of domestic politics (public opinion in Neville Chamberlain's England).

Regulatory agencies. In domestic politics, the oscillation of regulatory policy is the best illustration of negative feedback. As we have seen in the case of Moe's study of the NLRB, the influence of exogenous factors on the dynamics of the core is a point of great importance and general applicability. Of course, one might say that the oscillations in the political environment are themselves the expression of endogenous processes within a larger system. Like the NLRB, risk regulators such as the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) are more aggressive regulators when Democrats are in power than when Republicans are. This oscillation between parties, and the interest groups that thrive under their protection, is certainly systematic after a fashion. We shall return to this point below.

Politics aside, the very nature of risk regulation probably guarantees a certain amount of endogenous oscillation independent of that induced by the political environment (Hood, Rothstein, and Baldwin 2001; Bardach and Kagan 2002/1982). All that is required is regulators who wish to adhere to norms about making "good public policy" but who work under conditions of great technical uncertainty. This is a standard condition for almost all risk-regulating agencies. Good scientific information is often lacking about what exposures cause how much damage to what kinds of individuals under which circumstances. Nor do regulators know with certainty whether, in the real world of policy and program implementation, particular remedies will be applied effectively or not. Following Jonathan Bendor, suppose that regulators follow heuristics like "If it seemed to work in the past, keep on doing it" and "If it didn't seem to work, tighten (loosen) the regulatory regime." As long as mistakes appear to happen, the agency will not get trapped in a suboptimal regime, but it will not be able to prevent its oscillating away from an optimal regime either (Bendor 2004, 13–14).

Bendor uses the Food and Drug Administration as his primary illustration, following the work of Paul Quirk (Quirk 1980, ch. 6), and plausibly assumes that the point of optimal stringency lies within the limits of oscillatory movement. But of course, it need not do so. Bardach and Kagan (2002/1982) postulate a regulatory

dynamic that has regulatory stringency (in its multiple dimensions) oscillating according to political pressures in the short run and the medium run but over the long run, drifting upward. They refer to a "regulatory ratchet." In any given cycle, stringency may be reduced, but it will not be reduced below its lowest level in the previous cycle. If such a ratchet is indeed at work,[5] it would be a fortunate but only temporary happenstance that the optimum point would be located within the oscillatory limits.

Spending. In "The public as thermostat: dynamics of preferences for spending," Christopher Wlezien explicitly tests a negative feedback hypothesis, one based on what he takes to be a theory of democratic accountability, in which the public "would adjust its preferences for 'more' or 'less' policy in response to policy outputs themselves. In effect, the public would behave like a thermostat; when the actual policy 'temperature' differs from the preferred policy temperature, the public would send a signal to adjust policy accordingly, and once sufficiently adjusted, the signal would stop" (Wlezien 1995, 981). Wlezien did find, in regard to defense and to five social programs, that public preferences were a counterweight to budgetary appropriations: whatever direction they had moved in, public opinion wanted them to move back.

Elections and parties. Periodic contested elections in a two-party system are, of course, a negative feedback system writ very large. Although in a separation-of-powers system the idea of a "party in power" is sometimes ambiguous, over time grievances build up against whoever is identified as "the party in power," and voters "throw the rascals out." That these grievances may not realistically be attributable to the actions of the party or its standard bearers (Fiorina 1981) is not to the point. The feedback loop from party conduct to voter attributions of responsibility is not the only source of such attributions, and systems can function as smoothly with irrational as rational feedback. The system-like quality of electoral oscillations is not diminished by the lack of uniformity in the intervals between turnovers. The duration of such intervals probably must be explained by exogenous factors, such as business cycles, changing demographics, and random shocks from foreign events or scandals.[6]

Within particular election seasons, negative feedback systems also come into play. Anthony Downs's well-known spatial models of party positioning show that, in a simple single-dimensional (left/right) world of voter preferences, two parties are driven towards the center as they compete for the loyalties of the median voter. This is not a negative but a positive feedback system. However, the process may not move to completion, as the party leaders (candidates) are dragged back from the center by the threat of non-voting (and non-campaigning) from their party's base. Negative

[5] For evidence that the ratchet effect occurs, see Ruhl and Salzman 2003.

[6] The duration of intervals might, however, have a statistical regularity such as Zipf's law, which connects the frequency of an event type with the rank of that type in a population of related events. Zipf's law holds for diverse events like the appearances of words in the English language and the population sizes of cities. See Bak 1996, 24 6. For instance, the tenth most frequently used word appeared 2,653 times in Zipf's sample; the twentieth most used word, 1,311 times; and the 20,000th most used word once. Such data fit a straight line on a logarithmic plot with slope near one.

feedback arising from moves too far towards the center or back towards the party's enthusiasts leads to an equilibration of candidates' positions short of the median voter (Shepsle and Bonchek 1997, 114).

Reform cycles. Observers have noted episodes of reform—principally anti-corruption, anti-business, and/or anti-government—in American political history. Samuel Huntington speaks of a characteristically American "creedal passion" to create a civic life of democratic and ethical purity erupting every sixty years (Huntington 1981, 147 ff.). This eruption occurs when the "ideals-versus-institutions gap" has grown too large. Although Huntington does claim there is a systematic basis for the sixty-year cycle, he does not explain what it is.

Similarly, McClosky and Zaller, in their much praised *The American Ethos* (1984) postulate that, over decades, there are "swings in the national mood" between support for "a competitive, private economy in which the most enterprising and industrious individuals receive the greatest income" and "a democratic society in which everyone can earn a decent living and has an equal chance to realize his or her full human potential." These values of "capitalism" and "democracy" are in some tension politically and philosophically, they argue. Yet beyond this they do not specify the mechanisms whereby the predominance of one value set begins to retreat in the face of its rival.[7]

In the classic age of interest group theory, David Truman once famously wrote of the "balance wheel" in American politics, which had interest groups who triumphed in one round losing to newly mobilized "potential groups" in the next (Truman 1951, 514). "In a relatively vigorous political system . . . unorganized interests are dominant with sufficient frequency . . . so that . . . both the activity and the methods of organized interest groups are kept within broad limits" (1951: 515). Here indeed is a theory of reform cycles based on negative feedback.

Andrew McFarland has updated Truman and proposed a "reform cycle" theory focused on pro- and anti-business policies and politics from 1890 to at least 1991, the date of his paper (McFarland 1991). His summary:

> Economic producer groups have a more stable incentive to participate in issue area decision making than the reform groups that challenge their control. However, after a few years of the business control phase of the cycle, unchecked producer groups tend to commit "excesses", violations of widely shared values. This leads to political participation [and policy triumphs] by the reformers [1991, 257]. [But once legislation has been passed, and regulations drawn up] . . . the period of high politics is over: the public loses interest, journalistic coverage ceases, Congress and the president turn to other issues . . . , but the activity of producer groups remains constant, due to their continuing economic stakes . . . After a few years, another period of producer group power is at hand, leading eventually to new excesses, a new reform period and so forth. (1991, 263 4)

One implication of this theory, says McFarland, is that "across the scope of hundreds of issue areas, business control or reform phases tend to occur at the same time" (1991, 257).

[7] McClosky and Zaller greatly overstate the general case for a tension between these two value sets. Exchanging the highly charged "capitalism" for the more neutral "markets," democratic and market institutions are not only compatible but may be mutually required.

That there are indeed waves of "reform" cutting across many issue areas simultaneously is true enough. McFarland points in particular to the Progressive movement (after 1900), the New Deal (in the 1930s), and the 1960s (the civil rights and anti-Vietnam War movements). Whether these represent true cycles in an oscillating system is questionable, however. In McFarland's theory the stimulus for the reform phase of the cycle is "new excesses" by business, implying that it is an *increase* relative to some accepted or acceptable lower level of misconduct that triggers reform. The basic driver of the system is thus varying and objectively perceived levels of business misconduct. It is just as likely to be the case, however, that the actual levels of business misbehavior do not vary greatly over time and that changing social and cultural conditions trigger collective expressions of outrage and demands for "reform." It is noteworthy that since the 1960s, reformist demands have been directed at *both* business and government, that is, at institutions representing hierarchy (Douglas and Wildavsky 1982; Inglehart 1997).[8]

If there were indeed reform cycles in the past, they might have given way since the 1960s to a world of institutionalized "reform" almost on a par with the institutions of business. Critics would say even stronger than those of business. Reformist interest groups abound. In Washington and in some US state capitals, those representing "good government," environmental, gay, women, and safety interests have solid financial bases, professional staffs, and strategic sophistication.[9] Those representing the poor and various minorities are much weaker. All such interests benefit from the "rights revolution" of the last thirty to forty years, however, and have legal protection, at least in principle, against a great many more impositions than in earlier eras. Actual implementation of these rights is, of course, very patchy.

3.2 Monopolistic Equilibria and Punctuated Equilibria

Frank R. Baumgartner and Bryan D. Jones have taken an important step beyond the imagery and theory of the oscillating equilibrium (Baumgartner and Jones 1993). They postulate a condition of monopolistic control of the agenda in an issue area by established interests. An older imagery describing the same thing is the "iron triangle" (also "subgovernment") of interest group, executive agency, and congressional appropriations and policy committees. If this triad agreed on policy, no one else could get into the game. And even if they disagreed, they had a stake in keeping others out while they settled matters among themselves. Knowing this, few even tried. Baumgartner and Jones call this condition an equilibrium, even though it does not in fact equilibrate anything. It is an "equilibrium" only in the same sense that death is a state of "peace."

[8] Rejecting both cultural and corporate misconduct theories, David Vogel argues that reformist movements flourish when the economy is performing relatively well and become more quiescent when it is deteriorating (Vogel 1989).

[9] See Baumgartner and Jones 1993, 179 89 for useful details.

Nevertheless, the term is usefully applied here because overturning this system of domination, unlike being resurrected from death, is actually possible. Adopting the language of evolutionary biology, they call the overturning process a "punctuation" of the existing equilibrium. In a useful departure from the oscillation imagery, they presume that the forces unleashed by punctuation can start at almost any time and go off in many directions. Once alcohol abuse, for instance, gets on the agenda of social problems that government must somehow attend to, a variety of remedies are considered in a variety of venues. The brewers and distillers lobby cannot suppress all the talk everywhere. Policy approaches run the gamut from supporting research into drunk driving to education against alcohol abuse, to funding treatment. Moreover, institutions are established, such as the National Institute on Alcohol Abuse and Alcoholism, that ensure a continuing level of attention to the issue even after a popular groundswell may have receded (Baumgartner and Jones 1993, 161–4, 84).

Baumgartner and Jones describe two "models of issue expansion." In one case a wave of popular enthusiasm for dealing with a novel problem or opportunity leads to the creation of new policies and institutions. In the other case, there is a "mobilization of criticism," which invades existing monopoly turf and seizes control of the agenda. In both cases, media attention is a central and early developmental catalyst, followed by the attention of elected officials. Although Baumgartner and Jones count both cases as representing "pattern[s] of punctuated change" (1993, 244), the first ought not to count as an instance of "punctuated equilibrium." If there is indeed novelty, there is nothing substantive to punctuate. The punctuated change is only with respect to the pace of change itself.

4. Positive Feedback Processes: Endogenous Developments

In a purely technical sense positive feedback processes are more interesting than negative feedback processes. They are more complex and are sometimes counter-intuitive. They are also more interesting substantively, in that they are at the heart of all processes of growth and development.[10]

4.1 Momentum

Momentum affects many political processes, such as electioneering, legislative coalition building, developing interagency collaboratives, implementing complex pro-

[10] It is worth emphasizing that I am referring here to positive and negative feedback *processes* rather than *systems*. Systems often contain both, and which type of feedback dominates is often dictated as much by how an observer defines "the system's" boundaries as by ontological realities, such as they may be.

gram designs, energizing social movements, building community consensus, and diffusing innovations. The central structural fact about a momentum process is that every step in the process has a dual aspect. On the one hand, it is a movement in the direction of a goal; more indirectly, it creates a stimulus or an opportunity that encourages others to move towards the goal as well. In the simplest case, a bandwagon, every new supporter is an increment towards getting enough support to win according to the rules of the game; but it is also an addition to the signal that observers on the sidelines should regard this as the winning side.

A more complicated dynamic involves not merely signaling but interacting as well. Each new recruit to the cause becomes an asset in the emerging advocacy coalition as well, a potential proselytizer. Thus, in a community consensus-building process, each new recruit is both a confidence-building signal on a broadcast channel, so to speak, and a persuader and reinforcer to those with whom she communicates in a network of narrowcast channels. To take another example, implementing a complex program design, or building an interagency collaborative, is even more complicated. Each new institutional actor that begins to play its required role becomes (1) a bandwagon signal, (2) a persuader and reinforcer for others who are more reluctant, and (3) another node in a communications network that creates more capacity both to mobilize and to work through further implementation details. The constructive role of momentum building and of emergent new communications capacity was underappreciated in the pioneering work on implementation by Pressman and Wildavsky (Pressman and Wildavsky 1979), who assumed that all institutional actors made decisions independently of one another, whereas in most cases positive decisions by some increase the likelihood of positive decisions by others.

Momentum dynamics are at the heart of the very complex phenomenon of revolutions. Susanne Lohmann has postulated a model of "informational cascades" to illuminate mass protest activities leading to regime collapse and applied it persuasively to East Germany in the period 1989–91. The model incorporates: (1) "costly political action" by individuals that expresses dissatisfaction with the regime; (2) the public receiving "informational cues" from the size of the protest movement over time; and (3) loss of support and regime collapse "if the protest activities reveal it to be malign" (Lohmann 1994, 49).

4.2 Selective Retention

From biological evolution, selective retention is familiar as a competitive process. This model obviously applies to the results of electoral competition as well. A less obvious application of the model is to agenda setting. John Kingdon has applied the model, however, to remarkable effect (Kingdon 1995).[11] Separate streams carrying problems, policies, and politics course through a community of political elites, intersecting haphazardly if not exactly randomly. Elements of each stream may

[11] He calls it a "garbage can model," but this counts as a type of evolutionary model.

combine with one another and flourish ("coupling," for Kingdon) should they be lucky enough to pass through a "window of opportunity," itself created by a confluence of macro and micro events. The result is that within the relevant subset of political actors, a certain problem, and a certain set of candidate policies, gets to be discussed, that is, treated as an "agenda" issue.[12]

4.3 Path-dependent Shaping of Policy Options

Today's policy options are a product of policy choices made previously—"the path"—sometimes decades previously. Hence the concept of "path dependency." Those earlier choices may have both a constraining, or "lock-in" effect and an opportunity-enhancing effect.

The current health care delivery system in the United States is an example of both such effects. Rationalizing the current system is constrained by the extensive system of employer-financed health insurance for employees plus the tax-exempt status of such insurance for the recipients. If employers could not offer this benefit, to keep employee total compensation at the same level they would have to increase the employee's *after-tax* income. This would cost employers more than they presently pay in insurance premiums. The public treasury also has a stake in the present employer-based system to the extent that any shift from employer financing to government financing would be a budgetary burden. Here we have two serious institutional barriers to shifting away from employer-based and tax-subsidized financing. The scheme overall rose to prominence in the 1930s, following the marketplace's invention of group-based health insurance and employers' perception that offering such insurance as a fringe benefit might foster worker allegiance and retard unionization (Hacker 2002, 199–202).

The evolved system, or the installed base as some would put it, constrains radical departures from it. Hence the lock-in effect. On the other hand, what started as an afterthought in the collective mind evolved into a full-fledged policy system, a very extensive system of health insurance for the working population and their families. As is the case with most tax-expenditure-financed policies, it multiplied by stealth far more than an on-budget financing scheme would probably have done. Hence what I called above the opportunity-enhancing effect.

Policy reforms are a special but nevertheless representative case of policy evolution processes in general, and Eric Patashnik has followed the course of three reforms over the years following adoption: airline deregulation in 1978, the 1986 tax reform (which lowered rates and broadened the base), and the Federal Agricultural Improvement and Reform Act (FAIR) in 1996 (Patashnik 2003). Although the rates have stayed low, the tax base has shrunk again, as special interests never laid to rest, chipped away at it.

[12] To this model, True, Jones, and Baumgartner add what they call a "serial shift" in attention. This involves both a shift in the object of attention and a self reinforcing process of attention growth from disparate quarters (True, Jones, and Baumgartner 1999, 103).

Similarly, the subsidies ended by FAIR have made a return. But the new flexibility given to farmers over planting decisions has been retained, since farmers made large investments in the expectation of continuation. These investments warded off any serious thoughts of diminishing the flexibility. Thus, reform got "locked in." Or perhaps one might better say that would-be meddlers got "locked out" (Schwartz n.d.). What is the difference between reforms that stick and those that don't? Those that stick develop constituencies that will be greatly aggrieved if the reforms don't stick.[13] Airline deregulation was successfully maintained because it created almost overnight a number of winners in the newly competitive airline industry who have resisted—or locked out—efforts to roll back the deregulation.[14]

What is the explanation for path dependency? In an influential line of thinking, nicely expressed in a paper by Paul Pierson (2000), the explanation lies in "increasing returns." In the context of production this means higher returns to the next increment of investment virtually without limit (without the normal process of diminishing returns setting in), as in the case of a software firm that creates larger network economies among its product users the larger the network grows. Pierson applies the idea to policy-making systems: it is easier politically to try to modify something already in place than to set out on a new course even if the new course is believed technically superior; and in any case, preferences endogenously shift towards the current policy configuration, giving it an automatically increasing return. Hence, there is a positive feedback loop. Pierson's conclusions are reasonable, but it is unnecessary and generally misleading to invoke increasing returns as an explanatory model. The imagery behind increasing returns is endogenously expanding opportunity, whereas the appropriate imagery for the policy-making process is typically endogenously increasing constraint (lock-in/out). Even in the case of opportunity-enhancing effects (e.g. tax expenditures facilitating the expansion of subsidized health care), the increasing returns model would still be misleading if in fact the marginal returns function were conventionally shaped (rising and then falling) and the observer accidentally focused only on the rising portion.[15]

The particular paths that policy has taken in certain spheres of regulatory policy bear special mention. Government regulation, market structure, common law rules,

[13] On the importance of constituencies as barriers to terminating policies in general, see Bardach 1976.

[14] For other examples of constituency creation that is intended to lock in policies, see Glazer and Rothenberg 2001, especially 78, 114. The 1977 Clean Air Act amendments forced expensive scrubbers on the coal burning utilities partly because, once the capital investments had been made, the industry would have little incentive to press for revisions in the direction of regulatory leniency. Glazer and Rothenberg also conjecture that military service academies plus minimum years of service requirements following graduation is a better way to subsidize officer training than to provide higher salaries during a career. The higher salaries strategy would be subject to policy reversals down the line; and, unwilling to take this risk, potential recruits might not sign up.

[15] One of the virtues of the "path" metaphor is that it reminds us that the character of the path depends on the distance from which it is observed. The same path that looks full of twists and turns to a pedestrian might look perfectly straight to an airplane passenger passing over it. The federal welfare reform Act of 1996 looks like a revolution close up (end welfare as an entitlement, require work as a condition of receipt, time limits on receipt), but from a distance it looks like a modest recalibration of some of the mutually interdependent terms in a fairly stable social insurance contract (Bardach 2001*b*).

and trade and professional association oversight often co-evolve. They are partial functional substitutes for one another in market conditions of information asymmetry combined with high transaction costs in common law enforcement. Thus, the regulation of milk and dairy products began in the early part of the twentieth century because consumers were uninformed and ill effects sometimes hard to attribute definitively or cheaply. As small retail groceries with open milk bins gave way to large supermarket chains, milk in cartons, better refrigeration, and the ability to monitor the quality of dairy farm conditions, the utility of government regulation declined. Dairy farms have in effect become vertically integrated into the operations of large buyers with a reputation to protect. In California, government inspectors have effectively been made into paid agents of the large buyers in all but name.[16]

4.4 Trial-and-error Learning

The policy process is in some sense a trial-and-error problem-solving process. Problems arise, citizens complain, and policy makers offer a policy solution. The solution works imperfectly (or not at all), the facts become known, and a new policy solution is devised. It too is imperfect, and the process then continues.

Although it is common to conceptualize trial-and-error learning as a negative feedback process (deviations from the goal stimulating adjustments that get closer to the goal), learning in complex and ambiguous problem situations is better thought of as a positive feedback process. The positive feedback element under these conditions has to do with the constantly improving store of information and analytical understanding about both the nature of the problem to be solved and the workability of potential solutions. By what mechanisms does this learning process work? And how well?

System-wide learning. Based on the literature, it is hard to answer these questions. Most of the literature on social and organizational learning refers to the private sector. It therefore assumes substantial goal consensus within the organization (profit maximization, typically). Rational analysis (variously interpreted), open communication, and open-mindedness are thought to be critical (Senge 1990).[17] The policy process, however, institutionalizes value conflict as well as consensus formation. Learning is undoubtedly present, and emerges from the work of advocacy coalitions (Sabatier and Jenkins-Smith 1993). However, it is typically much more effective in policy domains that lend themselves to technical analysis (e.g. worker safety and

[16] See Roe 1996 for an interesting evolutionary story about how government regulation of the securities market arose as a functional substitute for oversight by strong national banking firms, which failed to emerge because Andrew Jackson vetoed the rechartering of the Second Bank of the United States.

[17] Even under these conditions, it is hard for learning that occurs in small groups within an organization to diffuse to other units (Roth 1996).

environmental issues[18] more than child abuse prevention). Learning is also selective. What is learned is smoothed so as not greatly to deform the learner's preconceptions. Learning is also a matter of cultural, not merely cognitive change (Cook and Yanow 1996), and may be inhibited across the cultural communities existing within the borders of advocacy coalitions. If the policy-making *system* learns at all, and learns how to increase overall welfare rather than simply a partisan version of it, how might that happen?

One possibility is that turnover within elites brings to the fore, temporarily, a faction that learned something complementing and/or correcting what its predecessor took for granted. It is the Bendor process of oscillation enacted on a larger scale. Whether the temporary learning survives the next turnover, however, is a different question. In the political process it sometimes happens that new elites cast down the work of their predecessors simply because it was the work of their predecessors. One constraint on such a process is the presence of technically minded professionals in the orbit of the political elites. Nearly any agency or legislative body has at least some such individuals who will be a ballast for technical rationality.[19] And forums that manage to cut across opposed advocacy coalitions may be able to give technical rationality a better hearing than it otherwise might receive (Sabatier and Jenkins-Smith 1999, 145–6).[20]

Interjurisdictional learning. If a technical solution to a problem has been tried somewhere else and seems to work, it should have a leg up on ideas still untried. And if that somewhere else is a nearby jurisdiction, such as a neighboring state or city, so much the better. A momentum effect is likely at work: "the probability that a state will adopt a program is proportional to the number of interactions its officials have had with officials of already-adopting states" (Berry and Berry 1999, 172); and the potential for such interactions goes up as a function of the number of already-adopting states. In any case, there is by now solid evidence for the realism of regional diffusion models (Walker 1969; Berry and Berry 1999, 185–6). In the realm of public administration, a diffuse philosophy called "New Public Management," which is highly results oriented and sympathetic towards competitive outsourcing, entrepreneurial management, and other practices normally associated with business, has picked up momentum across many jurisdictions in the USA and also internationally (Barzelay 2001; Hood 1998; Hood and Peters 2004).[21]

[18] See, for instance, Perez Enriquez 2003; Taylor, Rubin, and Hounshell 2004. In the latter case, one must think of private sector entities (utilities and technology firms) as part of the relevant policy system.

[19] This does not mean they are without flaws and prejudices of their own. But on balance, across all agencies, and in the long run these flaws and prejudices are probably less harmful than those of the political elites whom the technical cadres serve.

[20] For an interesting exception to all the above a case where two ideologically opposed legislators set out on what proved to be a successful mission to learn jointly about welfare policy see Kennedy 1987.

[21] It started in the UK and in Australia and New Zealand in the early 1980s.

4.5 Complex Systems

Complex systems are hard to predict because they are hard to understand. The primary source of the complexity is the multiplicity of interactions within the system, or as Jervis calls them, "interconnections" (Jervis 1997, 17).[22]

The creator and guiding spirit of the "system dynamics" school of systems modeling since the early 1960s has been Jay W. Forrester, now emeritus of the Sloan School of Management at MIT. According to Forrester (Forrester 1968) and his interpreter George P. Richardson (Richardson 1991, 300), systems with multiple, non-linear, and high-order feedback loops are "complex." Cause and effect are not closely related in time and space, and are often counter-intuitive. They are also "remarkably insensitive to changes in many system parameters" (Richardson 1991, 301), presumably because their behavior is dominated by the structural interconnections between their components and between components and the emergent system itself.

Compensating feedback. Forrester and his disciples have long been interested in policy issues. They have concluded that "compensating feedback" mechanisms hidden in complex systems would often defeat policy interventions. For instance, in *Urban Dynamics* Forrester argued that government-sponsored low-income housing and a jobs program for the unemployed would create a poverty trap, expand the dependent population within the city, and diminish the city's prospects, while tearing down low-income housing and declining business structures would create jobs and boost the city's overall economy (Forrester 1969).[23] A systems dynamics study of heroin use in a community concluded that a legal heroin maintenance scheme for addicts would not stop heroin addiction because reduced demand from one subgroup would simply induce new users into the market to take up the slack, and pushers would more aggressively recruit new suppliers (Richardson 1991, 307–8).

Such studies are conducted by means of computer simulation. Although the model structure and parameters can be calibrated against reality to some extent, typically model construction requires a lot of guesswork. Hence, although it is quite possible that the models in these and other such cases were sufficiently realistic to give good projections, it is also possible that they were not, as critics have typically alleged. In any case, it is generally accepted that complex systems are indeed hard to predict, and often counter-intuitive and insensitive to their precise parameters.

Agent-based models. The systems dynamics school populates its models with "level" variables, feedback loops connecting these levels, and "rate" variables governing the feedback flows. It is in a sense a "top-down" approach to systems modeling, since the modeler must know, or assume, a lot about the structure and the parameter values. Robert Axelrod has pioneered a "bottom-up" approach to the modeling of systems, populating his models with a variety of independent agents who interact

[22] Robert Axelrod and Michael D. Cohen write, "a system should be called complex when it is hard to predict not because it is random but because the regularities it does have cannot be briefly described" (Axelrod and Cohen 1999, 16).

[23] Forrester was inspired to study the problem of the urban economy by a former mayor of Boston, John Collins, who occupied an adjacent office at the Sloan School for a time.

according to certain strategies. He has relied on computer simulation to project the emergence of empires, cultures, cabinets, business alliances, cooperative norms, metanorms, and perhaps everything in between (Axelrod 1984, 1997). In agent-based models, the relative densities of different types in the population change, as do the frequency of different strategies in use. Selection rules then allow these changing densities to propagate still further changes in the population (Axelrod and Cohen 1999, 3–7). When the community of agents seek to adapt to one another (even if that means "try to dominate"), Axelrod and Cohen speak of a "Complex Adaptive System" (1999, 7).

In their 1999 book Axelrod and Cohen sought to give advice to organizational managers (primarily) about how to "harness complexity." Perhaps the most valuable advice, in the authors' view and in mine, was the least specific: get comfortable with "the ideas of perpetual novelty, adaptation as a function of entire populations, the value of variety and experimentation, and the potential of decentralized and overlapping authority" (Axelrod and Cohen 1999, 29).

Simulation as a policy design tool. Almost any policy of significant scope and purchase will be intervening in a complex social, economic, political, and cultural system. Given its record of providing deep insights into the nature of complex systems, computer simulation is plausibly of some value as an aid for projecting the efficacy of alternative policy proposals or designs. The efforts appear to be fragmentary but growing.

One example is the work done, in the Forrester systems analysis tradition, by a group based at the State University of New York at Albany modeling alternative welfare-to-work program designs (Zagonel et al. 2004). For instance, they compared an "Edges" and a "Middle" policy and a Base Case fit to actual 1997 data. The Middle policy was designed to intensify investment in and emphasis on assessment, monitoring, and job finding. The Middle policy was implemented primarily by the social services agency. The Edges policy focused on what happened to clients before and after they entered the social services caseload. The relevant services were prevention, child support enforcement, and self-sufficiency promotion, functions not typically under the direct control of social services. The model contained various agency and other resource stocks. Somewhat surprisingly to the analysts, the Middle policy did not do well at all compared to the Edges policy in terms of reducing caseloads:

> To summarize the mechanism at work here, the Middle policy is great at getting people into jobs, but then they lose those jobs and cycle back into the system because there aren't enough resources devoted to help them stay employed. The Edges policy lets them trickle more slowly into jobs but then does a better job of keeping them there.

Another example is climate change models. Robert J. Lempert, Steven W. Popper, and Steven C. Bankes of the RAND Corporation are developing a computer-based tool for projecting the effects of various interventions to manage climate change as well as other such problems of large scale and long duration. They call the project "long-term policy analysis (LTPA)" (Lempert, Popper, and Bankes 2003, xii). Central to the generic LTPA problem is the inevitability of surprise and the consequent "deep

uncertainty" about what to model and how to model it. They propose four key elements of a high-quality LTPA:

- Consider large *ensembles* (hundreds to millions) of scenarios.
- Seek *robust*, not optimal strategies.
- Achieve robustness with *adaptivity*.
- Design analysis for *interactive exploration* of the multiplicity of plausible futures. (2003, xiii)

They note that none of the computer models available for modeling climate change were suitable for their own work because the models "strive[d] for validity through as precise as possible a representation of particular phenomenology" (2003, 82). What they chose instead was almost the opposite, a simple systems-dynamics model, Wonderland, which provided the flexibility they needed "for representing crucial aspects of the robust decision approach—e.g., consideration of near-term adaptive policies and the adaptive responses of future generations" (2003, 82).

4.6 Chaos Theory

Even if most complex systems are insensitive to their parameter values, as Forrester contends, this is not true of all of them. System outputs that increase as a multiplicative function of their own growth and of the difference between their actual growth and their potential growth are an important exception. They exhibit four types of behavior depending on how intensively they react to this product, expressed by the parameter w in equation (3):[24]

$$y_{t+1} = wy_t(1 - y_t) \tag{3}$$

At low levels of reactivity, they approach a point equilibrium; at higher levels they oscillate stably; at still higher levels they are oscillating and explosive; and at the highest levels they show no periodic pattern at all and appear to be random—"chaotic"—even though their behavior is in fact completely determined (Kiel 1993; Baumol and Benhabib 1989). The set of points towards which any such system moves over time is said to be an "attractor."[25]

The time profile of such a system can also shift dramatically as its behavior unfolds. For this reason the behavior of the system will look very different depending on where in its course one first views the behavior, i.e. the first-observed value of y. Hence, the system is said to be sensitive to its "initial condition,"[26] although a more

[24] This is "[t]he most widely used mathematical formula for exploring [the] behavioral regimes [of interest] . . . a first order nonlinear difference equation, labeled the logistic map" (Kiel and Elliott 1996*a*, 20).

[25] For a discussion of the properties of five basic different attractors, see Daneke 1999, 33, and also Guastello 1999, 33 5.

[26] This sensitivity is often called "the butterfly effect" because the flapping of a butterfly's wings in Brazil could, by virtue of its happening within a chaotic system (weather), set off storms in Chicago.

meaningful characterization would usually be "the point at which we choose to start graphing it."

How much of the world really fits? It is still open as to whether chaos models realistically describe many phenomena of interest to students of policy or the policy process. I suspect it will always be difficult to choose between models of endogenously induced chaotic change and more commonsensical models of exogenously induced multivariate but linear change laced with pure randomness.[27] Chaos models can only be applied to substantially closed systems with a relatively long history, and it is not clear that such phenomena exist in great abundance. Macroeconomic systems are the most obvious (Baumol and Benhabib 1989).[28]

Unfortunately, because "chaos" is often used loosely, it may describe *any* nonlinear complex process. For instance, Berry and Kim (1999) entitle a paper "Has the Fed reduced chaos?" when they mean by "chaos" a series of changing oscillating equilibria in two historical periods from the end of the Civil War through 1950. An even greater danger is that the "sensitivity to initial conditions" of chaos models will be applied to systems that are merely linear and therefore, in principle, much more manageable. Hamilton and West (1999), for instance, analyze a twenty-seven-year time series of teenage births in Texas and claim to find a pattern behind which lies a non-linear dynamic system, the character of which they do not explicitly define and for which they provide no plausible behavioral theory. Yet they conclude by warning that "a small change in school policy, health care accessibility or welfare eligibility can, due to feedback in the system, result in large changes in teen births." Were it only true in social policy that small changes *could* issue in large results! It is more likely that "compensating feedback" (see above) finds a way to dampen results.

Self-organizing systems. Decentralized systems with rich interactions and good information flow among the components are capable of evolving high degrees of internal coordination and productivity. They are "self-organizing." It is possible that their richest possibilities for attaining a high degree of self-organization occur when their interactions have reached "the edge of chaos" (Kauffman 1995). However, this proposition may apply most effectively to inanimate or at any rate non-human systems. Human beings may be able purposively to create the requisite interaction, variety, and communication in a complex adaptive system without having to push themselves to such a danger point. It is noteworthy that Axelrod and Cohen, in *Harnessing Complexity*, hardly refer to chaos or its edge (Axelrod and Cohen 1999, xv, 72).

[27] The interaction of chaotic systems and exogenous disturbances is also possible, of course. The result is "nonlinear amplification that alter[s] the qualitative behavior of the system." These are called "symmetry breaking"events (Kiel and Elliott 1999, 5).

[28] See also the persuasive efforts by Courtney Brown to apply chaos models to electoral phenomena, particularly to the rise of the Nazi Party in the 1930s (Brown 1995, ch. 5). Less persuasive are the political chapters contained in Kiel and Elliott 1996*b*.

4.7 Qualities-based Sequencing

So far we have been discussing what might be called the dynamics of quantities: the feedback loops tell us that the more (or less) of *x*, then the more (or less) of *y*. But there is no reason to eschew qualitative models where they are appropriate. The basic idea behind these can be summed up as: Sequence Matters.

In an earlier work (Bardach 1998) I have conceptualized the emergence of a well-functioning interagency collaborative—an "ICC"—as the result of a *building* process.[29] The process has a dynamic aspect, in that sequence makes a difference, just as in building a house it is only the erection of a frame that then permits one to install a roof, or the creation of a wall that will then constitute a medium for the making of doors and windows. Considered in feedback loop terms, each step feeds back into the emergence of a new state that affords a previously non-existent opportunity to reach the next-most state.

Opportunities. These states are qualitative. In the ICC case, they are defined by the variety of organizational and political building blocks that have been assembled on the way to building a functional collaborative. These would include, for instance: a workable operating system, a culture of pragmatism, a threshold quantity of real resources, a degree of political latitude, and a number of others. The full set is displayed in Fig. 16.2[30]. The sequence in which these elements are assembled makes a difference to how well the building process works.

Figure 16.2 in effect puts forward a hypothesis: it is more efficient and less risky to put the building blocks in place in the depicted sequence—starting from the bottom and moving upward—than it is to assemble them in any other sequence.[31] Space does not afford the opportunity to explain just why this developmental sequence might be more efficient and less risky than some alternative sequence of interest.[32] One example, concerning just one pairing in the sequence, must suffice, namely the proposition that trust should precede the acceptance of leadership rather than the other way around. Leadership is extremely useful for solving communications and other problems in an emerging collaborative (as indicated by the platforms above it in Fig. 16.2). It can be fragile, though, because the institutional partners in a typical

[29] "ICC" stands for Interagency Collaborative Capacity. It is a more precise term than "collaborative" because at any given moment in the evolution of the "collaborative" it may not be capable of doing much and the participants may be doing more arguing than collaborating. "Capacity" may be large or small, growing or shrinking; hence it can be construed as a continuous variable, which is analytically useful.

[30] Slightly modified from Bardach 1998, 274.

[31] The process of trying to execute better rather than worse sequences I call "platforming." I leave aside complexities such as the relatively weak but non trivial interdependence between platforms supporting the two different legs of the structure.

[32] See Bardach 2001*a* for further details. Nor is it clear which of all the alternative sequences should be held up to comparison. I acknowledge that empirical evidence bearing on the efficiency and risk properties of this sequence matter is fragmentary and merely suggestive (Bardach 1998, ch. 8). The main point, though, is not to assert the truth of this particular developmental hypothesis but to illustrate the nature of reasoning about how sequence might matter.

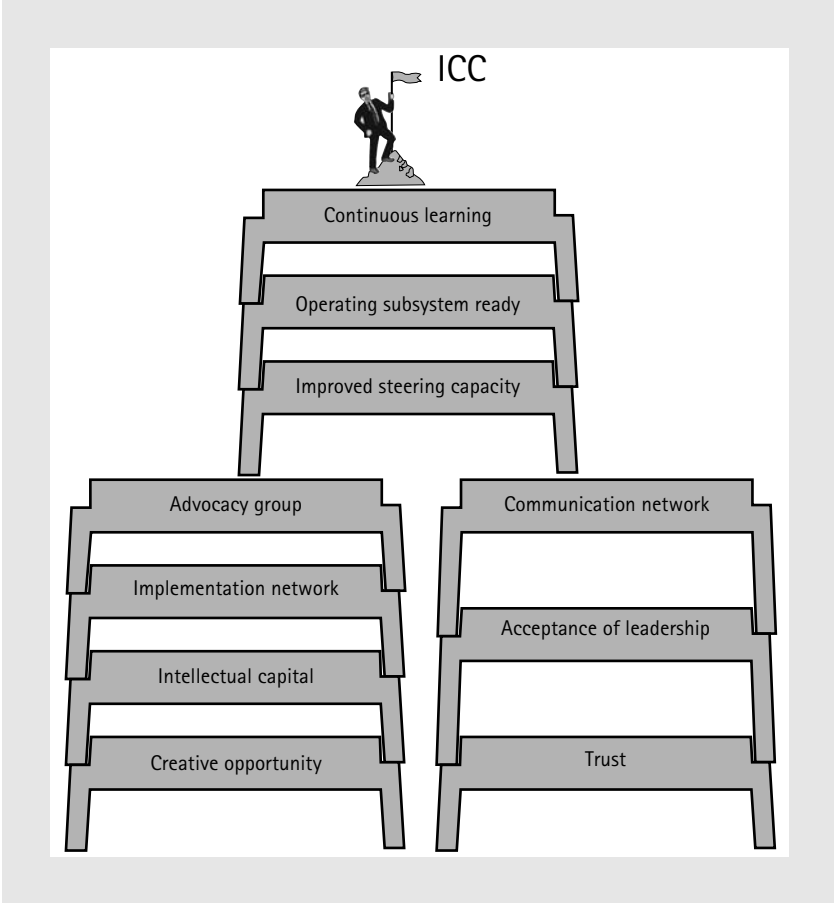

Fig. 16.2. Each new capacity a platform for the next

collaborative are moderately suspicious of one another. Thus, leadership will function best if a prior base of trust can be established.[33]

5. Dynamics without Feedback Loops

Not all dynamics processes involve feedback loops. Some unfold in only one direction.[34]

[33] There is more to the dynamics of ICC construction than platforming, I would note. Building momentum of various kinds is also significant (Bardach 1998, 276–92).

[34] Some systems dynamics theorists would question this possibility. They would say that nothing fails to produce feedback of some kind, however indirect. This is true. Nevertheless, as mentioned earlier, to

5.1 Selective Retention and Filtering

We discussed selective retention above, in the section on positive feedback, and offered the example of agenda setting. In the Kingdon model, agendas emerged from the agglutination of policies, politics, and problems as they intersected and survived a chancy competitive process. One could see the entire process as composed essentially of a selective retention subsystem and an agglutination subsystem. The agglutination subsystem is dominated by positive feedback loops and gives its character to the whole system. However, it is also possible to view selective retention as a process that works, in some circumstances, without the benefit of feedback loops at all.

Consider, for instance, the evolution of the common law rules of property, torts, and contracts, which, if not "policy" in a traditional sense, are the functional equivalent of "policy" in their own sphere, which often overlaps with that of policy. One of the most impressive developments in the social sciences in the last quarter-century has been the field of law and economics. And one of its most impressive conclusions is that the rules of the common law evolve in a welfare-maximizing fashion.[35] Briefly, the argument turns on the assumption that relatively inefficient[36] laws will be litigated at a higher rate than efficient laws. This occurs because inefficient laws fail to sustain the wealth-increasing social arrangements that efficient laws do, and a party that loses wealth under an inefficient legal rule loses more than a party who loses under an efficient rule. Facing a larger incentive, more of the first kind of losers sue, and spend more on trying to win, than do losers of the second kind. So long as judges are not biased *against* efficiency in their decisions, this process selects against inefficiency (Cooter and Ulen 1997, 375–6). This is surely a dynamic process, but it is one without feedback.[37]

This process involves not merely passive variation and selective retention. There is also a propulsive element, i.e. the motives behind litigation. It is a special kind of evolutionary process, therefore, a filtering process. Many potential common law rules pass through the filter of judicial consideration, attached, as it were, to litigants' claims; but the filter retains (in the long run) only the more efficient of these, while the rest wash into history. Another such filtering dynamic is the well-known Peter Principle, whereby people "rise to the level of their incompetence." The dynamic involves promotion in a hierarchy based on demonstrated competence in a particular position. Once one demonstrates incompetence in a position, advancement ends and the incumbent just sits there, being incompetent. (Of course, if promotion depends on expected rather than demonstrated competence, the Peter Principle does not

draw the boundaries around a particular system or process is ultimately an analytical, not an ontological decision. There is no analytical barrier to defining a dynamic process as single directional.

[35] Such claims are not generally made about statutory law, however, nor should they be.

[36] "Inefficient" in the technical economic sense of the term.

[37] In fact there is an element of positive feedback, since common law rules do not get transformed overnight. They get eroded and refashioned, at both the extensive and the intensive margin; and each instance of eroding and refashioning feeds into the legal culture to facilitate further change. However, we focus here only on the filtering subsystem.

apply.) A special case of a filtering process is stranding, e.g. the progressive concentration of less motivated, and perhaps less apt students in certain public schools as the wealthier and more education-oriented families in the catchment area move away or opt for private schools.

5.2 Event Cascades

What I shall call "event cascades" are another significant class of one-way dynamic processes. These are sequences of events that have a built-in, or structural dynamic, like the stones in a rockslide that come from above and dislodge stones below, or the workings of a Rube Goldberg machine. Discrete events trigger subsequent discrete, and substantially irreversible events through the medium of a structure that links them. Here is an example in political life from Winston Churchill, describing changes in British naval technology before the First World War (quoted in Jervis 1997, 129, though he does not call this an event cascade): "From the original desire to enlarge the gun we were led on step by step to the Fast Division, and in order to get the Fast Division we were forced to rely for vital units of the Fleet upon fuel oil. This led to the general adoption of oil fuel and to all the provisions which were needed to build up a great oil reserve. This led to enormous expense and to tremendous opposition on the Naval Estimates.... Finally we found our way to the Anglo-Persian Oil agreement and contract which ... has led to the acquisition by the Government of a controlling share in oil properties and interests."

No doubt it is a lot easier to describe such an event cascade once it has occurred than to model the process that produces it and to use the model to predict the result beforehand. One could conceptualize the process as the actualization of one chain of events out of a host of potential events probabilistically linked in a Markov matrix. The empirical challenge would entail defining the universe of potential events contained in the Markov matrix and then stipulating each of their contingent probabilities. Most event chains through such a matrix would have close to no probability of being actualized. A few would probably stand out as very likely candidates; and a very few would be intriguing long shots. The event chain from the British decision to enlarge a warship's guns to a transformation of British Middle East policy might not have been apparent to decision makers *ex ante*; but in Churchill's account, it seems *ex post* to have been a near certainty.

6. Future Research

I conclude with suggestions for future research. If the study of policy dynamics were "a field," these thoughts would be cast as a proposed research agenda. But the

phenomena that ought to be studied through a "dynamics" lens are varied and do not congeal as one field. Nor, with the important exception of computer simulation, is there or ought there to be a widely utilized methodology.[38] At the conceptual level, our understanding is so rudimentary that it makes sense to let dozens of flowers bloom—agent-based models, systems dynamics models, chaos models, cascade models, punctuated equilibrium models, and path dependency models, to mention only the principal models already discussed. All are promising in their own way, and one can only urge work on all of them.

I am, however, ready to urge particular attention to two phenomena that I take to be of unusual substantive significance and which require a dynamic approach: (1) understanding a process Aaron Wildavsky once labeled "policy as its own cause," and (2) bringing more rigor to the study of what scholars loosely call "stages" or "phases" in various processes, particularly that of legislative coalition building.

6.1 Policy as its Own Cause

Aaron Wildavsky in 1979 wrote of "the growing autonomy of the policy environment" (Wildavsky 1979, 62), because policy "solutions create their own effects, which gradually displace the original difficulty," and "big problems usually generate solutions so large that they become the dominant cause of the consequences with which public policy must contend." His prime example was Medicare and Medicaid, which succeeded in expanding access for the poor and elderly but at the same time made access more difficult for others and increased costs for everyone. The whole system started to behave unpredictably:

> For each additional program that interacts with every other, an exponential increase in consequence follows. These consequences, moreover, affect a broader range of different programs, which in turn, affect others, so that the connection between original cause and later effect is attenuated. One program affects so many others that prediction becomes more important and its prospects more perilous, because effects spread to entire realms of policy.

Social policy. A quarter-century ago, Wildavsky was writing about the *social* effects of policies, and sounding very much like Jay Forrester and his students in his concern over the sheer complexity of things. Today there is a second, if not third generation of problems that arise from the complexity of interactions, and these are the problems of making policy adjustments in an environment already dense with interconnected policies. In social policy, for instance, eligibility for one program is sometimes

[38] One of several reasons why our understanding of dynamic processes is not far advanced is that their internal behavior is too hard to grasp with language, pictures, or mathematics. Computer simulation is the solution to this problem, as work in the agent based models and the Forrester type "systems dynamics" traditions attests. To be sure, there are uncertainties over how to validate computer models, but computer simulation is a powerful tool that deserves to be wielded more extensively by scholars interested in dynamics.

conditioned on eligibility for another, so that reasonable cutbacks (or expansions) in the latter have unexpected and undesirable effects in the former. As these interdependencies multiply, it becomes more difficult for responsible policy makers to consider adjustments of any kind. The gridlock is worsened when low-level adjustments are also delayed pending higher-level and more comprehensive reforms that policy makers signal are "imminent." This is not just a locked-in or locked-out effect, but a locked-up effect.

The important questions for study here concern just how prevalent these phenomena are and what mechanisms are at work. Of interest also is the question of what exactly happens should one of these cascades actually be set in motion. Do negative feedback loops kick in at some point to dampen the disequilibrating consequences?

Regulatory policy. In the regulatory sphere, J. B. Ruhl and James Salzman have written of "the accretion effect" on emerging bodies of regulatory rules (Ruhl and Salzman 2003). Various mechanisms cause rules to accumulate but only rarely to diminish. Ruhl and Salzman claim, with some evidence, that this accretion has a negative effect on compliance, vastly increases the compliance burden on companies (in the environmental area), and diminishes the legitimacy of the regulatory regime. They present a further claim which is more interesting and more speculative. It concerns what they call "the properties of dynamic conflicting constraints" (2003, 811), which cause improved compliance with one rule to decrease the likelihood of compliance with another. They appeal to the theory of complex dynamic systems to explain why this should happen. Despite a few examples, however, they do not provide evidence of a widespread problem. This is a tantalizing theoretical as well as practical issue, and more systematic research would be welcome.

6.2 "Phases" and "Stages"

There is no shortage of the word "dynamics" in the titles of works about one or another aspect of the policy process.[39] Usually, the implications are that important developments happen in "stages" or "phases," that earlier stages somehow condition later ones, and that later stages have been conditioned by earlier ones. For instance, in conventional accounts of "the dynamics of the legislative process," successive majorities must be sought in subcommittees, committees, and full chambers; and a compromise at one stage may reduce or enhance a bill's prospects at a later stage. In the course of interagency collaboration, to take another example, Barbara Gray has written that there are three phases: problem setting, direction setting, and structuring (Gray 1985, 916–17). A paper on the development of buyer–seller relationships posits

[39] "Dynamics" is often a virtual synonym for complex phenomena that are slightly mysterious and that may or may not actually be "dynamic" once properly understood.

that they "evolve through five general phases identified as (1) awareness, (2) exploration, (3) expansion, (4) commitment, and (5) dissolution ... Each phase represents a major transition in how parties regard one another" (Dwyer, Schurr, and Oh 1987, 15). A controversy swirls over whether the idea of "stages of the policy process" is or is not analytically useful (deLeon 1999). The most recent list of candidate stages is: initiation, estimation, selection, implementation, evaluation, and termination (deLeon 1999, 21).[40]

I acknowledge that any such list of phases or stages is bound to be at least in part a product of the observer's theoretical notions, for developments of this sort are in no way "natural kinds." Nevertheless, these developmental categories do not seem to me well enough grounded empirically. The developments in question ought to be expressions of *endogenous* systems processes, and it is not clear to what system these processes might belong. Is it possible to conceptualize developmental phases of this sort that will prove analytically useful?

What is analytically useful? By social scientific standards a conceptual scheme is analytically useful to the extent that it permits one to generate propositions about the world that are insightful, interconnected, explanatory, and realistic. In the case of trying to conceptualize endogenously connected developmental phases, it is hard to know how to apply this standard because the idea of offering a satisfying "explanation" is elusive—a point I shall not elaborate upon here. A satisfactory alternative, however, is to use a practical standard that is in all respects but the demand for explanatory power like the social scientific standard. In place of explanatory power, the practically based standard asks whether the conceptual scheme could produce an *intertemporal map of the foreseeable risks and opportunities that might emerge*; for with such a map anticipatory strategies can be canvassed.

I made an unsophisticated effort to model the endogenous emergence of such risks and opportunities in *The Skill Factor in Politics* (Bardach 1972, 241–60). The generic model tracked "Support" (a continuous variable) through time in a legislative contest over a reformist policy proposal. The time path of Support rose and fell as a function of: (1) mobilization on the part of an advocacy coalition, (2) lagged resistance on the part of opponents, (3) differential adherence by a small pool of neutrals, (4) concessions and sweeteners that alter the evolving shape of the legislative proposal, (5) the emergence of intracoalition tensions and resultant defections in response to the changing shape of the proposal, (6) the uncertainties, and struggles over various arena and scheduling parameters, and (7) the intersection of the current contest, in its endgame phase, with a variety of unrelated issue agendas, actors, and influence patterns. The model was intended to map foreseeable risks and opportunities that a hypothetical entrepreneur would try to anticipate and prepare for.

[40] DeLeon credits Garry Brewer with this list. Brewer derived it from Harold Lasswell's seven stages: intelligence, promotion, prescription, invocation, application, termination, and appraisal.

So far as I am aware, neither this model nor any model aiming to accomplish the same objectives has found a place in the literature on legislative dynamics. I do not hold a particular brief for my own effort. But I do think the objective would be scientifically useful as well as of practical worth to a would-be legislative entrepreneur, and that others should try their hand at the problem.

References

Axelrod, R. 1984. *The Evolution of Cooperation*. New York: Basic Books.

1997. *The Complexity of Cooperation: Agent Based Models of Competition and Collaboration*. Princeton, NJ: Princeton University Press.

and Cohen. M. D. 1999. *Harnessing Complexity*. New York: Free Press.

Bak, P. 1996. *How Nature Works: The Science of Self Organized Criticality*. New York: Copernicus.

Bardach, E. 1972. *The Skill Factor in Politics: Repealing the Mental Commitment Laws in California*. Berkeley: University of California Press.

(ed.) 1976. Special issue on termination of policies, programs, and organizations. *Policy Sciences*, 7 (June).

1998. *Getting Agencies to Work Together: The Practice and Theory of Managerial Craftsmanship*. Washington, DC: Brookings Institution.

2001*a*. Developmental dynamics: interagency collaboration as an emergent phenomenon. *Journal of Public Administration Research and Theory*, 11 (2): 149–64.

2001*b*. Exit "equality," enter "fairness." In *Seeking the Center: Politics and Policymaking at the New Century*, ed. M. A. Levin, M. K. Landy, and M. Shapiro. Washington, DC: Georgetown University Press.

and Kagan. R. A. 2002/1982. *Going by the Book: The Problem of Regulatory Unreasonableness*. Somerset, NJ: Transaction.

Barzelay, M. 2001. *The New Public Management: Improving Research and Policy Dialogue*. Berkeley: University of California Press.

Baumgartner, F. R., and Jones, B. D. 1993. *Agendas and Instability in American Politics*. Chicago: University of Chicago Press.

2002. Positive and negative feedback in politics. In *Policy Dynamics*, ed. F. R. Baumgartner and B. D. Jones. Chicago: University of Chicago Press.

Baumol, W. J., and Benhabib, J. 1989. Chaos: significance, mechanism, and economic applications. *Journal of Economic Perspectives*, 3 (1): 77–105.

Bendor, J. 2004. *Bounded Rationality: Theory and Policy Implications*. Berkeley: Goldman School of Public Policy.

Berry, F. S., and Berry, W. D. 1999. Innovation and diffusion models in policy research. In *Theories of the Policy Process*, ed. P. A. Sabatier. Boulder, Colo.: Westview Press.

Berry, J. L., and Kim, H. 1999. Has the Fed reduced chaos? In *Nonlinear Dynamics, Complexity and Public Policy*, ed. E. Elliott and L. D. Kiel. Commack, NY: Nova Science.

Brown, C. 1995. *Serpents in the Sand: Essays on the Nonlinear Nature of Politics and Human Destiny*. Ann Arbor: University of Michigan Press.

Cook, S. D. N., and Yanow, D. 1996. Culture and organizational learning. In *Organizational Learning*, ed. M. D. Cohen and L. S. Sproull. Thousand Oaks, Calif.: Sage.