The Self-Organizing Polity

An Epistemological Analysis of Political Life

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About the Book and Author

Is the study of living systems a useful metaphor for political science? In this book, Dr. Dobuzinskis argues for further exploration of biopolitical models to explain the complexity of political theory and social change. His discussion emphasizes the new cybernetics, which considers not only self-regulating but also self-organizing or self-producing systems. Self-organizing systems operate in an autonomous sphere comparable to the autonomy of the political community and the political actors who compose this community. The autonomy of these systems is maintained through dynamic equilibration processes that entail not only the preservation of a given structure but also, at crucial times, the creative rearrangement of the existing structure and its transformation into a new pattern of relations. From this perspective, a political crisis is both a threat to the political system and the occasion of its renewal; stability may also mean decay.

Emphasizing the links that have developed historically between the natural and social sciences, this book is a reflection on the merits of and difficulties involved in representing the evolutionary process at the political level as the problematic reproduction of national communities and states.

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Laurent Dobuzinskis

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Contents

Introduction

My purpose here is to evaluate critically both the methods and the subject matter of political science. Political scientists spend probably as much time writing about the methodology of political science as they do writing about politics. Some may think that this is unfortunate. But such an inclination is the inescapable consequence of the nature of our ill-defined subject matter. Methodological reflection is necessary for ensuring that what we write about is relevant to the concerns of those who are engaged in political activities and continually reproduce the political structures that sustain political life. This book is precisely an attempt to consider political life as a series of complex processes that the life sciences can help us to understand more fully.

Theoretical research of this kind must, of course, be informed by a discussion of concrete realities. The post-behavioralist movement has rightly denounced the tendency to postpone the analysis of emerging political issues until that time when they can be explained by means of a fully developed theoretical framework. Contemporary issues such as the crisis of the nation-state and the politics of man's relation with nature will be addressed. However, I argue that theoretical research ought not only to be practically relevant, but also to be epistemologically relevant, by which I mean that it should address the problems that pose a challenge to the dominant scientific paradigms.

Finally, there is a moral dimension inherent in any theoretical inquiry. I am concerned in particular with the reduction of reason to instrumental rationality which, in practice, takes the form of a confusion of the good with the imperatives of technology. Although the relationship between science, technology, and moral or religious values remains more complex than it is sometimes claimed to be by critics of our technocratic age, it is also true that the technological *Zeitgeist*, as it were, acts as a powerful leveler. As far as politics is concerned, one of the most far-reaching technological developments of the last two decades has been the tremendous

progress of informational technology and its transformation into a kind of "decisional technology" that has had a decisive impact on public policy-making. It has contributed to the opinion of the technocratic elite that politics is a derivative, if not altogether dysfunctional, activity. My contention is, however, that in theoretical cybernetics we can find powerful arguments against the manipulative practices that we have come to associate with applied cybernetic techniques of decision-making in large bureaucracies. I do not intend to show that "pure" cybernetic theory has become the victim of unscrupulous technicians motivated only by the pursuit of selfish gains, for there are clear, logical connections between some theoretical principles in cybernetics and the technocratic ideal of a rationalized, centralized mode of societal control. But there are several distinct trends in theoretical cybernetics, some of which point towards a radical critique of both science and society.

Political scientists interested in systemic and cybernetic analogies have almost completely ignored the second generation of cybernetic models whose origins are traced hereafter. They are aimed at the formalization of the "problem of order"—the perennial problem of articulating and ranking the principles that give a meaning to the inner and outer realities of our lives. Of course, the problem of order has always been a concern for philosophy, but with the new cybernetics it has become a concern for science *qua* science.

The Old and the New Cybernetics

Twenty years after the publication of the first edition of Karl Deutsch's *The Nerves of Government*, it may sound trite to claim again that cybernetics can make a contribution to the scientific study of politics and to the practical application of scientific knowledge to policy-making. But I will argue that the second generation of cybernetic models pose new questions and suggest new answers. The first three chapters of this book provide an in-depth analysis of their substantive content but, to avoid any misunderstanding, a brief historical account of their development is in order here.

We can trace back the origin of systems theory to the 1930s when Ludwig von Bertalanffy began to look for a way out of the controversy between the mechanistic and vitalistic approaches in biology. The former did not offer any clue about the complex interactions out of which the unity of living things emerges; the latter was decidedly too mystical to qualify as a scientific conception. Bertalanffy quickly came to the realization that organisms should be viewed as "open systems" whose behavior could only be understood by expanding the laws of conventional physics and chemistry.[1] Although he had from the beginning envisaged the possibility of further generalizations of the organismic principles he was elaborating,

he waited until the late 1940s to publish his findings. Since then General Systems Theory (GST) has developed out of his work.[2] This theory follows an "empirico-intuitive" approach whereby statements of a general nature are arrived at in the wake of the detailed examination of a variety of concrete systems.[3] The ultimate goal is to formulate mathematical expressions describing modes of transition from one system state to the other, whatever the system might be; Bertalanffy favored systems of differential equations for this purpose.[4] But the weaknesses of the inductive method, coupled with Bertalanffy's lack of mathematical sophistication, explain in part why the ambitious objectives ascribed to GST have not been met. The kind of problems raised by this school of thought, centered as they are on dynamic phenomena like finality, growth differentiation, the thermodynamics of life, etc., are nevertheless still worth investigating. However, this cannot be done without the help of cybernetic concepts and methods.

Cybernetics originated in the research carried out by Norbert Wiener in the 1940s. Wiener was the author of the seminal work *Cybernetics or Control and Communication in the Animal and the Machine* (1948), and benefitted from his collaboration with J.H. Bigelow and the neurophysiologist A. Rosenblueth. He was involved with the former in the design of servomechanisms—i.e., machines that can, in some respects, be regarded as "intelligent"—and his association with the latter suggested far-reaching applications of what he had discovered about such machines.[5] Feedback is, of course, the central concept of cybernetics. For the moment let us simply define feedback as a closed information loop. When information about previous system states is used to counterbalance transformations taking place within the system, a "negative" feedback is at work; when, on the contrary, information contributes to the acceleration of internal transformations, "positive" feedback is at work. The first type is characteristic of adaptive, stable behavior, like that of the human body with respect to temperature, or of a heating installation controlled by a thermostat. The second type causes exponential growth or regression; the recent and dramatic increase of the world population is a good illustration of positive feedback at work. N. Wiener and electronic engineers were particularly interested in negative feedback processes. Undeniably, control feedback is an essential dimension of cybernetics but the importance ascribed to that concept varies from one author to the other.

The technological applications of cybernetics, which also gained from the parallel development of information theory, have been almost exclusively concerned with control feedback. In this perspective systems maintenance is paramount. Moreover, first-generation cybernetic models typically incorporate optimizing algorithms intended to reduce the complexity of the systems under consideration to a very limited range of outputs. What is

known in the management sciences as "systems analysis" is rather directly inspired from this kind of systems engineering.

However, cybernetics is not reducible to technology. The theories of cybernetic machines or automata developed by J. von Neumann, W.R. Ashby, and W. McCulloch[6] are pure scientific abstractions, even if they can be instructive in the design of concrete automated machines. In particular, when compared to N. Wiener's dazzling combination of mathematical sophistication and philosophical erudition, R.W. Ashby's work may appear more mundane. But his understanding of the significance of cybernetics for the study of living systems has turned out to be more illuminating. In particular, being less concerned than other cyberneticians of his generation with the technological applications of cybernetics, Ashby was in a position to move cybernetic theory out of the domain of *techne* and to ground it in the domain of *theoria*, especially in his contention that the materiality of the cybernetic machine was an irrelevant consideration.[7] His theory of machines is a theory in the fullest sense of the term, and not a treatise on machine building. On the basis of this argument, G. Günther suggests that cybernetics rests on a subjective ontology; its world is populated by autonomous subjects capable of making unpredictable choices.[8] Actually this remark more accurately applies to the "new cybernetics," in the development of which Günther has played an active part, than to the first generation of cybernetic models. With hindsight, Ashby appears to have been a transitional figure between the old and the new cybernetics.

It is perhaps too simple to suggest that the difference between the old and the new cybernetics lies in the importance that they attribute to the concept of positive feedback—that is, almost nil in the case of the former, paramount in the case of the latter. But it is true that the rediscovery, so to speak, of positive feedback in the early 1960s laid the groundwork for the formulation of a dialectic of feedback that finds its most articulate expression in the theory of self-organization. Three symposia on the subject of self-organization were held in 1959, 1960, and 1961.[9] During the mid-1960s the initial impetus weakened, perhaps because of the lack of direct application. H. von Foerster and the other members of the Biological Computer Laboratory of the University of Illinois still kept the movement alive, and it resurfaced in the 1970s, partly as a result of the deadly blow dealt by Ilia Prigogine to the universality of the second law of thermodynamics. (The non-equilibrium systems upon which Prigogine carried out his experiments possess the capacity to organize their rate of entropy production and thereby to alter their own structures.) The idea of self-organization has since been popularized by the writings of Erich Jantsch and Edgar Morin.[10] Chapter 3 of this book is devoted to an exposition of the central themes of this approach; but, at this point, it is sufficient to characterize the new cybernetics as an attempt to look beyond the regulation of the structures

of a given system by raising the question of their origin. And that origin is found in the *autonomy*—in the literal and etymological sense of the term—of organizationally closed complex systems capable of reacting upon their own structures.

The New Cybernetics and the Science of Politics

The theory of self-organization offers a formalized, albeit somewhat incomplete, description of the processes through which complex systems, feeding on both entropy (or disorder) and "negentropy" (or order), generate their *own* structures. Thus one can speak of the "creative function of disorder." Such a conception suggests original points of view for the discussion of three current problems in political theory, including both political philosophy and empirical theory. First, what could be the relevance of the concept of system in the post-behavioral, post-positivist age which political theory has now entered. Second, on what basis could one establish the complementarity of traditional political theory and empirical theory, that such an epistemological context presupposes. Finally, what should be the methodological and practical implications of the contemporary rediscovery of the naturalness of man-the-political-animal, prompted by the ecological crisis. This book does not propose definitive answers to these momentous questions; rather it argues that i) a shift of emphasis in political inquiry, from a preoccupation with explaining how political actors act as they do in a given societal context, to a creative exploration of what is thereby learned and achieved that contributes to the production and reproduction of our individual and collective identities; and ii) the adoption of "dialogical" and diachronic methods of analysis, i.e., methods based on a multi-valued logic and explicitly incorporating a temporal dimension, are two prerequisites for a fruitful synthesis of normative and empirical political theory and for the furthering of the already lively dialogue between natural and social scientists.

The emphasis placed by the second generation of cybernetic models on the reflexive character of systemic/cybernetic concepts and methods reveals, in contrast, the epistemological paradox inherent in David Easton and Karl Deutsch's attempts to ground their own positivist behavioral approaches in what turns out to be a non-positivist paradigm.[11] Admittedly, this sounds like a plan for flogging a dead horse, as systems theory has been criticized *ad nauseam* in political science, found wanting in many respects, and is no longer considered relevant by most researchers, even if textbooks still rely on it. However, it is imperative to rescue some of the assumptions of systems theory and of cybernetics from this debacle for they give a substantive content to the notion of organized complexity.

The new cybernetics also suggests a way out of the longstanding quarrel between the ancients and the moderns; the controversy opposing empiricists and philosophically minded political theorists has been rather inconclusively settled in favor of the latter, to the extent that it is generally realized now that the behavioralists' rejection of metaphysics was itself based on a particular metaphysical view which has been losing ground in the philosophy of science since the beginning of this century. Yet we still lack a well articulated *problématique* to support on-going research. In the wake of the so-called post-behavioral revolution, a multitude of ad hoc philosophical perspectives and corresponding methods of inquiry have been suggested with little success. But the theory of self-organization provides us with an opportunity to pose anew, and in terms that are relevant to current concerns, the perennially fundamental problem: What is human nature? I do not propose a final answer to that problem, but the new cybernetics suggests that man, being the most complex and adaptive living system, is a fully autonomous subject. In unpredictable ways, man actively contributes to his reproduction and also to that of his natural and social environments, or the biosphere and the "noosphere." The biosphere is itself conceived as a complex field of interactions among self-organizing systems; and the noosphere, by which I mean the sphere of communicative action, including language and culture, also follows a developmental logic of its own. The implications of this perspective for political inquiry are varied and challenging.

Furthermore, a neo-cybernetic approach to politics suggests a series of interesting linkages between the natural and social realms. To reintroduce the notion of human nature poses the question of knowing what is human in nature and what is natural in man. Indeed, as Serge Moscovici puts it, the "natural question" is the dominant problem of the 20th century.[12] Here again, the theory of self-organization opens up the possibility of a reappropriation of older philosophical views, including Aristotle's *physis*. Of course, it would be bad science as well as bad philosophy to simply return to a pre-Galilean idea of nature. But cybernetics and several theoretical developments in thermodynamics and biology invite us to look critically at the dogmatic separation between nature and culture which is still characteristic of the social-scientific world-view. Is there really a gap between physico-biological and socio-cultural realities? When we look at our natural environment as a field of interactions among self-organizing systems, then man's social mode of existence becomes a measure of his naturalness. If so, could our knowledge of self-organizing natural systems inform our knowledge of society and vice versa? Far-reaching as these questions may be, they have been raised and debated over the last ten years by a loose group of French natural and social scientists, among whom Edgar Morin is perhaps the most influential. Morin's fascinating, if sometimes less than

rigorous, elaborations upon the theory of self-organization provide useful bearings throughout much of this book.

The concepts of production and reproduction, commonly used in biology and economics, have less commonly been applied to the analysis of political life.[13] But if we are to understand politics as a creative process through which individuals and groups seek to achieve evolutionary potentials, we need to study political activities in relation to the production, destruction, and regeneration of the various dimensions of societal order.

The notion of evolutionary potential is offered here as an alternative to the familiar but pointless antithesis between determinism and randomness. Change is a problematic concept that can be used only within the context of an axiomatic construction of reality; it will be argued (see Chapter 4) that the construction which is most relevant to political inquiry consists in an evolutionary paradigm for it gives meaning to the belief tacitly shared by political actors in the continuity of the constantly changing political community in which they live.

A recurrent theme throughout this book is that the organization of evolutionary potentials into actual structures takes place along three dimensions: experience, consciousness, and self-consciousness. While all these dimensions refer to the fundamental autonomy of political actors, the first one is the least concerned with their reflective, subjective attributes. Consciousness, as this term will be used hereafter, extends from subconscious desires, insofar as they are actuated in political demands, to what Anthony Giddens calls "practical consciousness," i.e., a "non-discursive, but not unconscious, knowledge of social institutions—as involved in social reproduction."[14] On the other hand, self-consciousness develops through discursive relations among fully cognizant subjects.

Self-regulating processes of structure maintenance will be analyzed mostly along the first dimension. Processes of identity formation in a political community, above and beyond the ever changing conditions of that community's existence, will be discussed along the second and third dimensions. But to do so, we must reconsider the level-of-analysis problem which is usually presented as that of a choice between micro and macro-analysis; micro-analysis focuses on individuals and small groups, whereas macro-analysis is concerned with the performance of the political system defined as a subsystem of society. I shall argue that macro-analysis is itself a multi-level approach. The primary level consists in the regulatory functions of the political system, that is to say the co-ordinating and coercive practices by which a structurally differentiated society maintains its integration.[15] But, looking beyond the institutional and behavioral boundaries of the political system, we ought also to raise the problem of the origins of the norms and values embodied in the political system, for a societal community reproduces itself by evolving new values through a global political process

that transcends analytical distinctions among functionally specialized subsystems.[16] The generation of norms and values poses a metatheoretical problem whose solution requires the formulation of a reflexive strategy of cognition. This is because the dominant themes of political theory contribute to the self-production of the polity.[17]

In brief, this book proposes to look at politics as an evolutionary process. Political life, from this perspective, involves a subtle dialectic of invariance and change. The recursive interaction of autonomous political actors and sub-groups with the political structures of the political community to which they belong delineate a field within which living systems of a new order (such as bureaucracies, nation-states, etc.) emerge from time to time, develop and evolve into still newer forms. The logic of this process does not depend on any subjective characteristic. However, the unique form assumed by these political beings reflects the practical and reflexive consciousness of the subjects who produce and reproduce them. Consequently, in order to understand self-organizing processes in political life, one must also formulate a strategy for relating empirical concerns to normative reflections.

Now the realization of a research program of this kind depends on the development of appropriate methods. Two fundamental questions arise in this respect.

First, what are the methodological implications of a position that combines a naturalistic vision of man-the-political-animal with a humanized vision of nature? The answer does not lie in the straightforward application of biological or ethological knowledge to the explanation of political life, but rather in the recursive exploration of organized complexity along a paradigmatic "loop" linking physics to biology and to political anthropology. My discussion of the notion of societal evolution will illustrate the merits of this approach (see Chapter 4). Second, what are the implications of an approach which re-introduces the notion of "self" in political analysis? I shall argue that the adoption of a cybernetic paradigm must be preceded by, and articulated to a discussion of the various dimensions of consciousness.

Third, I shall argue that we cannot explain political phenomena, but we can nevertheless construct models of the political process to simulate alternative societal priorities. To model complex systems one must first dig out, so to speak, most of the potential contradictions present in the system in order to render explicit the various possible developmental paths. This requires, as already stated, the adoption of a multi-valued logic and a diachronic methodology.[18]

Synopsis

This book is divided into eight chapters which are briefly summarized hereafter.

Chapters 1 to 3 are devoted to the analysis of the foundations of systems theory and cybernetics; they follow a logical progression from a discussion of the complexity inherent in the concept of system itself (chapter 1) to that of the complexity of the self-regulated systems described by the first generation of cybernetic models (chapter 2) and to a reflection on self-organizing complexity (chapter 3). Chapter 4 broadens the perspective presented in chapter 3 by applying it to the analysis of evolutionary process in both natural and societal systems. Chapters 5 to 8 focus on the more specifically political aspects of societal evolution. Chapter 5 proposes a three-dimensional grid which is articulated around the ontological notions of existence, consciousness and self-consciousness. It is then used for the reconstruction of the subject matter of political science in the next three chapters. Chapter 6 deals with the regulatory function of political institutions. In chapter 7, the evolutionary paradigm provides a starting point for a discussion of the problem of the re-production of national communities organized as political systems by autonomous actors entering into cooperative and conflictual relations in a public domain. Finally, chapter 8 suggests agenda of theoretical research on the interdependence of the social and natural sciences envisaged from the standpoint of a subjectivist epistemology.

Notes

1. See L. von Bertalanffy, "General Systems Theory—A Review," in W. Buckley (ed.), *Modern Systems Research for the Behavioural Scientist* (Chicago: Aldine, 1968), p. 13. Note that, at the same time, W. Kohler had expounded similar ideas; see W. Kohler, "Closed and Open Systems," in F.E. Emery (ed.), *Systems Thinking* (Penguin Books, 1969), pp. 59–69.

2. There is a General Systems Society which publishes the *General Systems Yearbook*.

3. L. von Bertalanffy, "General Systems Theory," p. 13.

4. Bertalanffy is the first one to admit that such a tool is of limited value, see ibid., p. 14, and his *General Systems Theory* (New York: Braziller, 1973, 2nd ed.) pp. 56–77.

5. See J. de Rosnay, *The Macroscope* (New York: Harper & Row, 1979), Chapter II.

6. See J. von Neumann, *Theory of Self-Reproducing Automata* (Urbana, Ill.: University of Illinois Press, 1966); W.R. Ashby, *An Introduction to Cybernetics* (New York: Wiley, 1956).

7. See ibid., p. 1.

8. See G. Günther, "Cybernetic Ontology and Transjunctional Operations," in M.C. Yovits et al. (eds.), *Self-Organizing Systems* (Washington, D.C.: Spartan Books, 1961), pp. 313–92.

9. See M.C. Yovits and S. Cameron (eds.), *Self-Organizing Systems* (New York: Pergamon, 1960); M.C. Yovits, J. Jacobi, and J. Goldstein (eds.), *Self-Organizing*