

EMERGENT ORDER / SELF-ORGANIZING SYSTEMS BIBLIOGRAPHY

NOTE: This is a working draft. All organizational categories are provisional. I will be grateful for suggested changes, additional publications, or any insights as to how to make it more valuable for scholarly research. If you want to submit an additional entry, please send it to me either as a title, or including an brief description modeled on what appears below. I can be reached at gdizerega@stlawu.edu

- Gus diZerega

Introduction

This is an annotated bibliography of key books and articles discussing various aspects of what are variously termed self-organizing systems, spontaneous orders, autopoietic systems, chaordic systems, systemic complexity, and so on. This terminological variety exists because the concept has appeared relatively independently in various contexts within philosophy, the social and the natural sciences.

What unites these terms is their common focus on phenomena where orders arises from elements within a system acting independently from one another within a framework of procedural rules or laws that generate positive and negative feedback such that independent behavior takes the actions of others into consideration without intending to do so, and that the impact of that behavior tends to facilitate more complex relationships of mutual assistance than could ever be deliberately created. Such systems generate order “spontaneously.” In doing so they can act in unanticipated ways because there is no overarching goal, authority, or blueprint that orders the actions of their components or the responses they make to feedback generated within the system.

This bibliography focuses on what can be broadly described as the social sciences other than economics. Because the social sciences are so diverse, and because these concepts have appeared under differing names, this list errs on the side of inclusion. However, for the most part it does not include what is usually called rational choice approaches to the social sciences. Sensitivity to the centrality of mutual feedback processes and systems level coordination are key criteria for inclusion. From a systems perspective, the kind of motives actually motivating participants are truly unimportant.

However, the system itself may privilege some kinds of motives and/or values over others because any set of rules will be more favorable towards some projects than others which are formally equally able to be pursued within it. For this reason we have included some rational choice work in the ethics section, because certain strategies generate feedback that reinforces such strategies under iterated (repeated encounters) conditions. At this point there are profound normative implications relevant to the emergence of unintended orders.

Economics is largely excluded because an enormous literature already exists on the self-organizing character of market processes. This approach has been most developed in what is called the “Austrian” school of economics. **(is there a comprehensive**

bibliographic sources for Austrian economics?) Far less well known are the roles similar processes play in the rest of human society. It is these areas of social life that this bibliography focuses on. However, it does provide links to sites where the basic relevant economic literature is listed.

The very abundance of disciplines where these concepts are being developed, combined with their often being arrived at independently from one another, produces many opportunities for terminological confusion. This is particularly the case with similar terms within the same discipline. For example, Vincent Ostrom and I use the term “self-governing” in somewhat different ways, and the reader is urged to be attentive. (He developed his terminology in his pioneering research, and I developed mine in initial ignorance of his work, and still prefer my own terminology to his.) Similar differences will often arise among other authors.

Self-organizing processes are very important in the natural sciences, and have generated an enormous amount of papers. We list only a small number of representative books and articles. The linkages between these fields and the social sciences are very real and potentially of enormous importance, particularly concerning the inner logic of cooperative over competitive systems and how internal differentiation can arise. However, in this bibliography we will offer only a brief introduction to the relevant literature. Links to bibliographies in these fields include:
<http://www.austinpowers.com/cgi-bin/shared/nph-proxy.cgi/000010A/http/www.calresco.org/offline.htm>

Finally, if you should be aware of significant contributions in these fields which we have ignored, please send us their title, author, and if you wish, a brief description, to www.. Due to the constraints of time, and not being omniscient, we will not necessarily list every publication on these topics, but we intend for this site to become the primary source for serious scholars wishing to discover what else is going on in related fields making use of these concepts. That is why we hope you will help us keep up to date as well as alerting us to older works we have missed.

I. FOUNDATIONS

1. Intellectual History

2. Classic Sources

3. Systems Theory and emergent order

4. The Hayekian Tradition and emergent Order

5. Interdisciplinary Overviews emphasizing emergent order in science and computers.

6. Complexity

7. Co-operation, Competition.

II. APPLICATIONS

1. Philosophy, Social Theory

2. Anthropology

3. Ethical Dimensions

4. History

5. Language

6. Law

7. Political Science

8. International Relations

9. Urban Issues

10. Sociology and Philosophy of Science

11. Civil Society, the Third Sector

12. Ecology

13. Ecological policy

14. Religion

15. Economics

16. Internet, Computers

17. Organization Theory

18. Cultural/Aesthetic Studies

19. Criticisms of the Concept

Acknowledgements

A number of scholars have contributed descriptions of books and articles in this bibliography. They are identified with their contributions. Others have provided particularly valuable assistance in uncovering valuable sources in the compilation of this bibliography. They are:

William Dennis, Christian Jackson, Erik Jacobson, Paul Mansour, Pete Peterson, jr., Brian Smith, Paul Varnell,

Note: In the list below, an “” preceding the listing means highly recommended to those getting started in this area.*

I. FOUNDATIONS

1. INTELLECTUAL HISTORY of emergent order studies

Barry, Norman. *The Tradition of Spontaneous Order, Literature of Liberty, V:2, Summer, 1982. 7-58.* An excellent overview of key concepts as applied to social life, intellectual history, and a focus on the market and common law. In terms of intellectual history, Barry focuses on the role of the sixteenth century Spanish ‘School of Salamanca,’ Sir Matthew Hale, Bernard Mandeville, Josiah Tucker, David Hume, Adam Ferguson, Adam Smith, Herbert Spencer, Carl Menger, and F. A. Hayek.

Most easily available today at:

<http://www.econlib.org/library/Essays/LtrLbrty/bryTSO1.html#bottom>

Hayek, F. A. *The Legal and Political Philosophy of David Hume, Studies in Philosophy, Politics and Economics, Simon and Schuster, 1967. 106-121*

Hayek distinguishes between the constructivist rationalism of many Enlightenment thinkers and the rational criticism of rationalism developed by Bernard Mandeville, and particularly by David Hume. Hume developed what came to be considered 19th century liberalism, as distinct from its democratic side, basing his skepticism towards political power on his argument for the narrow bounds of human understanding. Human development occurred primarily through evolution towards unintended outcomes rather than deliberate design. This was particularly true for the rise of law, but also was important in other fields.

_____. **Dr Bernard Mandeville, *New Studies in Philosophy, Politics, Economics and the History of Ideas*, Chicago: University of Chicago Press, 1978. pp. 249-266.**

Hayek argues Mandeville was the first to decisively introduce the concept of spontaneous or emergent order into Western thought, though he himself did little to develop it. That task fell on Hume and the Scottish Enlightenment. Mandeville's interest in emergent order developed as he worked out the implications of his psychology, and laid the foundation on which Hume built. For Hayek there could be little greater praise.

*** Horwitz, Steven. *Of Human Action But Not of Human Design*, 1999 Frank P. Piskor Lecture, Canton, NY: St Lawrence University, 1999. 33 pp.**

Perhaps the best brief overview of spontaneous order theory, beginning with its roots in the Scottish Enlightenment, especially Adam Ferguson and Adam Smith, through Karl Menger and Hayek to contemporary applications not only in economics, but also law, linguistics, evolutionary psychology, high technology, and the biological sciences. Horowitz also applies its implications to how we understand other cultures and links it with work in the Weberian sociological tradition.

Petsoulas, Christina. *Hayek's Liberalism and its Origins, his idea of spontaneous order and the Scottish Enlightenment*. New York: Routledge, 2001. 208 pp.

Petsoulas contrasts Hayek's evolutionary theory, based upon the unconscious adoption of successful traditions, with a model of conscious and rational adaptation based on trial and error, found in Mandeville, Hume and Smith. The author is particularly critical of Hayek's evolutionary theory which appears to require the existence of certain rules in order to generate a spontaneous order. Unlike the price system, rules of just conduct are 'neither generated nor maintained spontaneously'. The argument running through it is strong though dependent on too strict a reading of Hayek's theory in my opinion.

- Contributed by Mark Koyama

Titles not yet annotated

Eisner, Wolfram. Adam Smith's Model of the Origin and Emergence of Institutions: The Modern Findings of the Classical Approach, *Journal of Economic Issues*, 23:1, March, 1989. 189-213.

Haarkonssen, Knud. *The Science of a Legislator: The National Jurisprudence of David Hume and Adam Smith*, Cambridge: Cambridge University Press, 1981. 252 pp.

Hamowy, Ronald. The Scottish Enlightenment and the Theory of Spontaneous Order, ... 1990

Hill, L. Anticipations of Nineteenth and Twentieth Century Social Thought in the Work of Adam Ferguson, *Archives Europeennes de Sociologie*, 37:1.

Seidentrop, Larry. *Tocqueville (Past Masters)*, Oxford: Oxford University Press, 1994. 140 pp.

_____. *Two Liberal Traditions, The Idea of Freedom*, Alan Ryan, ed., Oxford: Oxford University Press, 1979. pp. 153-74.

2. CLASSIC SOURCES on emergent order

Ferguson, Adam. *An Essay on the History of Civil Society*, New Brunswick, NJ: Transaction, 1980 (1767). 280 pp.

A pioneering description of how social order can arise that is “the result of human action, but not the execution of any human design.” (p. 122) Though the term did not yet exist, Ferguson applies these ideas to the field of sociology.

Mandeville, Bernard. *The Fable of the Bees: or Private Vices, Publick Benefits*, 2 vols. Indianapolis: Liberty Fund, 1988 (1722, 1728). V. I. 558 pp, V. II. 486 pp.

In Hayek’s words, Mandeville made “the definitive breakthrough in modern thought of the twin ideas of evolution and of the spontaneous formation of an order. . . Perhaps in no case did he precisely show *how* an order formed itself without design, but he made it abundantly clear that it *did*, and thereby raised the questions to which theoretical analysis, first in the social sciences and later in biology, could address itself.” (Hayek on “Dr Bernard Mandeville”, pp. 250-1). The most important part of Mandeville’s work for this bibliography is volume II.

Paine, Thomas. *Thomas Paine, Rights of Man, Common Sense and Other Political Writings*, Oxford: Oxford University Press, 1998, 504 pp.

The opening of Paine’s *The Rights of Man* contains a very clear as well as early description of how order arises in society without recourse to controlling authority. This is simply one of many editions where one can find *The Rights of Man*.

Smith, Adam. *An Inquiry into the Nature and Causes of the Wealth of Nations*, 2 vols., Oxford: Clarendon Press, 1976 (1776)

The classic statement of economic theory which first brought to widespread attention the importance of emergent order or, as Smith put it, invisible hand” explanations.

_____. ***Considerations Concerning the First Formation of Languages, Adam Smith: Lectures on Rhetoric and Belles Letters*, Oxford: Clarendon Press, 1983 (1761). Pp. 203-26.**

Smith’s analysis of how language can arise through what we would call emergent processes.

Tocqueville, Alexis. *Democracy in America*, vol. I., New York: Schocken Books, 1961.

Volume one of *Democracy in America* contains several descriptions of Tocqueville’s finding order where initially chaos and confusion abound in a political and social system without over arching control, as “The appearance of disorder which prevails on the

surface, leads him [a European visitor] at first to imagine society is in a state of anarchy; nor does he perceive his mistake until he has gone deeper into the subject.” (p. 89)

Titles not yet annotated

Hume, David.

Kames, Lord (Henry Home)

Millar, John.

3. SYSTEMS THEORY and emergent order

Bateson, Gregory. *Steps to an Ecology of Mind: A Revolutionary Approach to Man's Understanding of Himself*, New York: Ballentine Books, 1972. 505 pp.

Trained as an anthropologist, Bateson's book spills into many different fields. While using terminology wedded to the cybernetic model of homeostasis rather than emergent order, his arguments go beyond those concepts, and are highly relevant to this bibliography. Bateson writes penetratingly about the complex interaction of different levels of systems, particularly the human mind, society, and nature. He provides a description of the problems of subjecting such systems to instrumental control of which the famous critique of central planning becomes a single, albeit important, example. Also important here is his discussion of the relationship of ethics to systems theory. See particularly pp. 426-505.

_____. **Form, Substance, and Difference, *General Semantics: The Journal of the Institute of General Semantics*, 1971. Also published in *Io/14, Earth geography Booklet No. 3, Imago Mundi*, 1972, and Richard Grossinger, ed., *Ecology and Consciousness*, Richmond, CA: North Atlantic books, 1978.**

Bateson's Alfred Korzybski Memorial Lecture of January 9, 1970, this essay offers a brief introduction to the major themes of his often difficult work. His description of the basic unit of natural selection as the organism-in-environment, circularity of cause and effect, difference as information, mind and evolution, and its implications for understanding human society are succinctly described here with great clarity.

Laszlo, Ervin. *The Systems View of the World*. New York: George Braziller, 1972. 120 pp.

One of the principle theorists of general systems theory, Laszlo offers an introductory outline of systems theory as it was conceived in 1972. Interesting for the purposes of this bibliography in the indistinct recognition of the importance of self-organization, or what Laszlo terms "self-creativity. He explicitly recognizes it in the natural world and in a general way in the social world, but conflates hierarchies among natural systems, which

have nothing to do with deliberate control, with hierarchies in social systems, where the examples he uses are from business and government, and are organized as control hierarchies. Compare pp. 46-8 with pp. 72-4.

Macy, Joanna. *Mutual Causality in Buddhism and General Systems Theory* Albany: State University of New York Press, 1991. 220 pp.

Macy uses general systems theory and Buddhist philosophy to illuminate the concept of mutual causality. Briefly, causality is best conceived not linearly, but in terms of dynamic interdependence. In Buddhist terms this is called “dependent co-arising.” In covering systems theory, Macy relies on the work of von Bertalanffy and Laszlo and their concept of “cybernetics II” in developing her analysis of systems theory. “Cybernetics II” allows for internal change within the system via its reaction to feedback, and so is self-organizing and emergent, whereas the original concept of cybernetics did not. Chapters 10 and 11 are perhaps most central to the concerns of this bibliography.

Titles not yet annotated

Bertalanffy, Ludwig von. *Robots, Men and Minds: Psychology in the Modern World*, New York: George Braziller, 1967.

Bunge, Mario.

Dyke, C. *The Evolutionary Dynamics of Complex Systems: A Study in Biosocial Complexity*, New York: Oxford University Press, 1988. 151 pp.

4. THE HAYEKIAN TRADITION AND EMERGENT ORDER

*** Gray, John. *Hayek on Liberty*, chapter 2: The Idea of a Spontaneous Social Order, chapter 6: Assessment and Criticism, Oxford, UK: Basil Blackwell, 1984. 27-55, 116-140, esp. 118-125.**

These two chapters from Gray’s book are particularly important. The first gives a detailed description of Hayek’s conception of spontaneous order and its similarity with biological processes in particular. Also of interest is his discussion of its similarities and differences with the economic (rational choice) approach to social behavior. Contrasting Hayek with Gary Becker, Gray argues for the ultimate superiority of Hayek’s approach. He also argues that it differs from the tradition of methodological individualism as it has traditionally been interpreted in the Austrian School of Economics, with which Hayek is associated. In his final evaluation, Gray describes some criticisms of spontaneous order theory, and, by accepting the libertarian critique of democracy, accepts that such processes can diminish as well as strengthen liberty. Nonetheless it remains a vital concept with respect to liberty because, under appropriate rules, it ends the zero sum character of social competition.

Hayek, F. A. *The Fatal Conceit: The Errors of Socialism*, Chicago: University of Chicago Press, 1988. 158 pp.

Edited after his death by W. W. Bartley, III.. For the purposes of this bibliography, along with its title, this volume explores in greater depth than Hayek's other work his analysis of cultural and biological evolution, the evolution of social customs and institutions as the unintended consequences of people acting for other reasons, the role of religion and tradition, and the limitations of reason in understanding social phenomena. Some argue that this final work reflects Bartley's views as much as Hayek's, but in either event it offers an interesting and important expansion of emergent order analysis beyond economic theory within the Hayekian tradition.

_____. ***The Political Order of a Free People*, vol. 3 of *Law, Legislation and Liberty*, Chicago: University of Chicago Press, 1979. 208 pp.**

Hayek's final volume in the *Law, Legislation and Liberty* series is a critique of political democracy's capacity to sustain the framework needed for a free society, an examination of the tensions between politics and the market order, and suggestions for political reform to create a "demarchy" which he believes will be largely resistant to these problems while fulfilling the valid values underlying the democratic ideal. An appendix offers his critique of sociobiology, Freud, and those who admire earlier tribal forms of society.

* _____. ***Competition as a Discovery Procedure*, *New Studies in Philosophy, Politics, Economics and the History of Ideas*, Chicago: University of Chicago Press, 1978. 179-190.**

This argument is also found in

* _____. ***Government Policy and the Market*, *The Political Order of a Free People*, vol. 3 of *Law, Legislation and Liberty*, Chicago: University of Chicago Press, 1979. 65-97.**

Competition can be rationally justified only when we do not know the outcome to which it would lead. Since competition exists to discover facts otherwise unknowable, it can not be tested empirically, only conceptually. Market competition is therefore similar to research in the scientific community. It is primarily a discovery procedure. While Hayek focuses on the market his arguments can be easily extended to any social spontaneous order.

_____. ***The Mirage of Social Justice*, vol. II. of *Law, Legislation and Liberty*, Chicago: University of Chicago Press, 1976. 191 pp.**

The second volume in the *Law, Legislation and Liberty* series applies the spontaneous order framework to the question of justice. Included are an analysis of how the general good differs from the sum of individual goods, the nature of justice, and why the concept of social justice is logically and politically incoherent. Hayek also argues that our innate moral sense is inclined to support tribal conceptions of justice, and so are in some tension with the legal and ethical requirements for a large complex social order.

* _____. ***Kinds of Order in Society*, Menlo Park, CA: Institute for Humane Studies, 1975. 19 pp. Previously published in *New Individualist Review*, vol. 3, no. 2, 1964. The basis for chapter 2 of *Rules and Order*, below.**

A basic introduction to the differences between emergent or spontaneous order and that arising from deliberate plans. Hayek includes discussion of the similarities between emergent order and that arising in the natural world, the central role of ignorance in social phenomena, the nature of rules able to generate such an order, and how they differ from the rules of deliberate organization.

_____. *Rules and Order, vol. I. of Law, Legislation and Liberty*, Chicago: University of Chicago Press, 1973. 180 pp.

These opening chapters to Hayek's three volume work focus on the character of emergent, or spontaneous orders, as compared with instrumental organizations, and how they evolve rather than are constructed by human intent. The remainder of the volume explores the implications of this analysis for the study of law.

* _____. *The Theory of Complex Phenomena, Studies in Philosophy, Politics and Economics*, New York: Simon and Schuster, 1967. 22-42.

Hayek discusses degrees of complexity. In particular, determining the minimum number of variables needed to reproduce characteristic patterns within different structures demonstrates "increasing complexity as we proceed from the inanimate to the ... animate and social phenomena . . ." (26). Truly complex phenomena allow only for "pattern predictions." The theory of evolution and valid social theory both can only offer predictions of this sort due to the complexity of their subjects.

_____, *The Use of Knowledge in Society, Individualism and Economic Order*, Chicago: University of Chicago Press, 1948. 77-91.

Any complex society is characterized by widely dispersed knowledge. In economic terms, but easily applicable to other social spontaneous orders, Hayek argues the basic problem is securing "the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know." (78). Central is knowledge of particular circumstances which is local, cannot be entered into statistics, and which somehow needs to be communicated between members often ignorant of one another.

Titles not yet annotated

Bianchi, Marina. Hayek's Spontaneous Order: The "Corerect" versus the "Corrigable" Society, in Jack Birner and Rudy van Zijp, (eds) *Hayek, Co-ordination and Evolution: His Legacy in Philosophy, Politics, Economics and the History of Ideas*. London: Routledge, 1994. 232-51.

Fehl, Ulrich. Spontaneous Order in Peter J. Boettke (ed.) *The Elgar Companion to Austrian Economics*, Aldershot, UK: Elgar, 1994. 197-205.

Fleetwood, S. Order Without Equilibrium: A Critical Realist Interpretation of Hayek's Notion of Spontaneous Order, *Cambridge Journal of Economics*, 20:6. 729-747.

Foss, Nicolai Juul. Spontaneous Social Order: Economics and Schutzian Sociology, *American Journal of Economics and Sociology*. 55:1, January, 1996. 73-86.

Kley, Roland. *Hayek's Social and Political Thought*, Oxford: Oxford University Press, 1994. 248 pp.

_____. Hayek's Idea of a Spontaneous Social Order – A Critical Analysis, *Kölner Zeitschrift für Sociologie und Sozialpsychologie*, 44:1, 1992. 12-34.

Kuninski, Milowit. Friedrich A. von Hayek's Theory of Spontaneous Order: Between "Verstehen" and "Invisible Hand Explanation." Auspitz, J. Lee, et. Al. Eds. *Praxiologies and the Philosophy of Economics, The International Annual of Practical Philosophy and Methodology*, vol. I., New Brunswick: Transaction, 1992. 347-67.

Lavoie, Don. Understanding Differently – Hermeneutics and the Spontaneous Order of Communicative Process, *History of Political Economy*, 22, 1990. 359-377.

_____. Economic Chaos or Spontaneous Order- Implications for Political Economy of the New View of Science, *Cato Journal*, 8:3, 1989. 613-635.

5. INTERDISCIPLINARY OVERVIEWS WITH EMPHASES ON EMERGENT ORDER IN SCIENCE, COMPUTERS, AND BIOLOGY

Dyson, George B. *Darwin Among the Machines: The Evolution of Global Intelligence*, Reading, MA: Perseus Books, 1997. 261 pp.

Dyson argues that the process of biological evolution is in fact being replicated in the evolution of technology. As machines evolve they increasingly take on the ability to process and coordinate information independently of human direction. They do so through distributed networks very similar in computational patterns to the networks of neurons within biological brains. Interesting discussions of the role of symbiosis in evolution, both biological and technological, and its implications for the interaction of the two.

Heylighen, Francis. *The Science of Self-Organization and Adaptivity*, available at:

<http://austin-cdn-o.websys.aol.com/cgi-bin/shared/nph-proxy.cgi/000010A/http/pespmc1.vub.ac.be/Papers/EOLSS-Self-Organiz.pdf>

An excellent overview within the scientific, computer, and artificial intelligence fields, of the concepts and principles of the theory of self-organization, containing many examples and clear explanations of its relevance to science and to future modelling of complex human and natural systems. Comes to the same conclusion regarding attempts at control of such systems as those from within the Scottish Enlightenment tradition: control and

detailed prediction is impossible in principle, beyond small changes at crucial places that will create new broad patterns of results.

*** Johnson, Steven. *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*, New York: Scribner, 2001. 277 pp.**

Johnson coffer a clear and engaging overview of the growing study of emergent systems, primarily with an eye to biology and computers. It also covers four central principles of the field: neighbor interaction, pattern recognition, kind of feedback, and indirect control. The book begins with a study of ant colonies, and how very complex and adaptive systems arise from communities of insects with very partial awareness guided by simple rules of behavior. He also discusses the possibilities of genuinely emergent systems arising within the internet, its close approximations in computer games, and actual emergence among net linked players of some games, such as Sim City. Johnson also examines emergent phenomena in cities, primarily through the work of Jane Jacobs; and in the media, and explores future possibilities. He appears completely unfamiliar with the work of Hayek and those influenced by him. Related to this, he does not distinguish between emergent orders describable in their entirety by deterministic processes and those that apparently cannot be.

Keller, Evelyn Fox. *Reflections on Gender and Science*, New Haven: Yale University Press, 1985. 179 pp.

Trained as a mathematical biophysicist, Keller has increasingly turned to the philosophical and social factors shaping modern science. Two chapters are of interest to the study of emerging systems. Part III: Theory, Practice and Methodology in the Making of Science, is relevant to this bibliography primarily through its discussion of ways of conceptualizing power and order, *especially pp. 129-138*. Keller's discussion suggests that arguments separating the human from the natural sciences are in error only because they in fact took the natural sciences at their word. They are, in important respects, more akin to the human sciences. Order, from her perspective, "can be spontaneous, self-generated, *or* externally imposed."(132). This leads to a reappraisal of what is meant by scientific laws and explanation.

*** Kellert, Stephen H. *In the Wake of Chaos*, Chicago: University of Chicago, 1993. 158 pp.**

One of the best introductions to chaos theory which, in his words, "provides an understanding of the appearance of unpredictable behavior by constructing models which reveal order." (79) Kellert's focus is primarily on chaotic physical systems which are distinct from living systems, but which share interesting similarities with them. Chaos theory involves a departure from mechanistic kinds of understanding towards what Kellert terms "qualitative understanding" through discovering patterns and connections rather than prediction of detailed outcomes. The point echoes Hayek's argument for "pattern prediction" in his essay on complex phenomena, also listed on this site. One interesting part of the book is his careful discussion of what determinism means in the context of chaotic systems. Perhaps of particular interest is his final chapter, which asks why chaos theory took so long to interest modern science. He suggests it was due to science's interest in controlling nature, leading to disregarding systems not amenable to

control and exploitation. In this way it suggests a common theme with similar problems faced within the social sciences, when they have argued against the possibilities of political and technocratic control. The chapter examines technological, institutional and ideological factors that account for the long-term neglect of chaotic phenomena in the sciences, providing empirical support for some feminist accounts of science. (Interestingly, Evelyn Fox Keller, a feminist theorist of science, has also provided important research in the character of biological emergent phenomena. This research is described in Steve Johnson's *Emergence*. Some of her relevant work is also on this site.)

Prigogine, Ilya. Science, Civilization and Democracy, *Futures*, August 1986. 493-507. Prigogine is a major figure in emphasizing the role of self-organization in chemistry. Here he explores the wider implications of the view of the world his research is helping to establish. Scientific rationality has traditionally been distinguished from that in the human world as well as between simple and complex systems. Prigogine argues this dichotomy has broken down because the old view had a "distorted" conception of scientific rationality. Simple systems far from equilibrium also acquire complex behavior. There are analogues with complexity in the social world, where he gives a "Hayekian" description of the market process. (503-5). Prigogine suggests this model of science is more compatible with traditional democratic values than the earlier models with their technocratic implications.

Titles Not Yet Annotated

Coveney, Peter and Roger Highfield, *Frontiers of Complexity: The Search for Order in a Chaotic World*, New York: Fawcett Columbine, 1995.

Kaufman, Stuart. *At Home in the Universe: The Search for Laws of Self-Organization and Complexity*, New York: Oxford University Press, 1995. 304 pp.

Kelly, Kevin. *Out of Control: The New Biology of Science, Social Systems, and the Economic World*, Perseus, 1995..

Levy, S. *Artificial Life: The Quest for New Creation*, New York: Random House, 1992. (www.hehd.clemson.edu/complex/AnnotBib.htm)

Marion, R. *The Edge of Organization: Chaos and Complexity in Social Structures*. Thousand Oaks, CA: Sage, in press.
(www.hehd.clemson.edu/complex/AnnotBib.htm)

Resnick, Michael. *Turtles, Termites, and Traffic Jams: Explorations in Massively Parallel Microworlds*, Cambridge, MA: MIT Press, 1999. 156 pp.

Wolfram, Stephen., *A New Kind of Science*, Wolfram Media, 2002

6. COMPLEXITY, CHAOS and emergent order

*** deJouvenal, Bertrand . Order vs. Organization, *On Freedom and Free Enterprise: Essays in Honor of Ludwig von Mises*, Princeton, NJ: D, Van Nostrand, 1956. 41-51.**

DeJouvenal discusses our commonsense concept of order as determined by configurations obvious to our minds. Such conceptions cannot grasp complex orders where order is operational rather than perceived through intuitive seemliness. We are predisposed to see order in this latter sense, yet the most important orders, such as life itself, are operational in character.

*** Hayek, F. A. The Theory of Complex Phenomena, *Studies in Philosophy, Politics and Economics*, New York: Simon and Schuster, 1967. 22-42.**

Hayek discusses degrees of complexity. In particular, determining the minimum number of variables needed to reproduce characteristic patterns within different structures demonstrates “increasing complexity as we proceed from the inanimate to the ... animate and social phenomena . . .” (26). Truly complex phenomena allow only for “pattern predictions.” The theory of evolution and valid social theory both can only offer predictions of this sort due to the complexity of their subjects.

Kellert, Stephen H. *In the Wake of Chaos*, Chicago: University of Chicago Press, 1993. 158 pp.

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*** Lewin, Roger. *Complexity: Life at the Edge of Chaos*, New York: Macmillan, 1992. 200 pp.**

A popular but not simplistic account of complexity and its relationship to systemic adaptation primarily focused on biological systems, with suggestive discussions of social systems and computer modeling. A final chapter discusses its role in the study of

consciousness. He distinguishes chaotic phenomena from “emergent global order” where stability itself is an emergent property. The author interviews many leading people in these fields, particularly at the Santa Fe Institute and in biology. While aware of similarities in economic phenomena – Adam Smith is referred to repeatedly - oddly absent is any attention to how his subject interacts with the Hayekian tradition. Pages 137-9 are particularly suggestive as to one way the connection could be made, however, especially when related with the emphasis of both traditions on how simple rules generate complex orders.

Titles Not Yet Annotated

Briggs, John and F. D. Peat. *Turbulent Mirror*, New York: Harper and Row, 1989.
(www.hehd.clemson.edu/complex/AnnotBib.htm)

Casti, John. *Complexification*, New York: Harper Collins, 1994.
(www.hehd.clemson.edu/complex/AnnotBib.htm)

Coveney, Peter and Roger Highfield, *Frontiers of Complexity: The Search for Order in a Chaotic World*, New York: Fawcett Columbine, 1995.
(www.hehd.clemson.edu/complex/AnnotBib.htm)

Cronbach, L. J. Playing With Chaos, *Educational Researcher*, 17:6, 1988. 46-49.
(www.hehd.clemson.edu/complex/AnnotBib.htm)

Gleich, John. *Chaos: Making a New Science*. New York: Viking, 1987.
(www.hehd.clemson.edu/complex/AnnotBib.htm)

Kauffman, Stuart A. *At Home in the Universe: The Search for the Laws of Self-organization and Complexity*. New York: Oxford University Press, 1995. 304 pp.
(www.hehd.clemson.edu/complex/AnnotBib.htm)

_____. *The Origins of Order*, New York: Oxford University Press, 1993.
(www.hehd.clemson.edu/complex/AnnotBib.htm)

Marion, R. *The Edge of Organization: Chaos and Complexity in Social Structures*. Thousand Oaks, CA: Sage, in press.
(www.hehd.clemson.edu/complex/AnnotBib.htm)

Sterman, J. D. Deterministic Chaos in Models of Human Behavior: Methodological Issues and Experimental results, *System Dynamics Review*, 4:1-2, 1988. 148-78.
(www.hehd.clemson.edu/complex/AnnotBib.htm)

Waldrop, M. M. *Complexity: The Emerging Science at the Edge of Order and Chaos*. New York: Simon and Schuster, 1992.
(www.hehd.clemson.edu/complex/AnnotBib.htm)

7. CO-OPERATION, COMPETITION and emergent order

Robert, Axelrod. *The Evolution of Cooperation*, Basic Books, New York: Penguin Books, Harmondsworth, Middlesex, 1984. 222 pp.

Axelrod's work is useful in demonstrating that there is a built in logical advantage to cooperative strategies as guides to social interaction. Beginning with the iterated prisoners dilemma, Axelrod shows how Tit for Tat, the best overall strategy for winning was nice (never being first to defect), provokable, forgiving, and clear. He also examines the evolution of cooperation in even improbable circumstances, such as between opposing sides during war. Important to the subject of this list because rules generating emergent social orders are rules for cooperation that are undermined by uncooperative behavior, defined systemically. Suggests why such orders are so robust and powerful compared to less cooperative ones. Also important with respect to understanding the normative content inherent in social emergent systems.

Titles not yet Annotated

Robert, Axelrod. An Evolutionary Approach to Norms, *American Political Science Review*, 80. 1095-1111.

Heylighen, Francis. Selfish Memes and the Evolution of Cooperation. *Journal of Ideas*. 2:4. 77-84.

II. APPLICATIONS

1. PHILOSOPHY, SOCIAL THEORY and emergent order

*** Berger, Peter and Thomas Luckmann, *The Social Construction of Reality: A Treatise on the Sociology of Knowledge*, Garden City, NY: Doubleday, 1967.**

Building on the previous work of Alfred Schutz, the authors demonstrate how, in their words, "Society is a human product. Society is an objective reality. Man is a social product. . ." The work is important for the study of spontaneous order because it demonstrates the importance of feedback within systems of social action, demonstrating that, on the one hand, methodological individualism is a basic element in any viable social theory, but on the other, that by itself it is inadequate to understand societies and their institutions as systems.

*** Gray, John. *Hayek on Liberty*, chapter 2: The Idea of a Spontaneous Social Order, chapter 6: Assessment and Criticism, Oxford, UK: Basil Blackwell, 1984. 27-55, 116-140, esp. 118-125.**

These two chapters from Gray's book are particularly important. The first gives a detailed description of Hayek's conception of spontaneous order and its similarity with biological processes in particular. Also of interest is his discussion of its similarities and differences with the economic (rational choice) approach to social behavior. Contrasting

Hayek with Gary Becker, Gray argues for the ultimate superiority of Hayek's approach. He also argues that it differs from the tradition of methodological individualism as it has traditionally been interpreted in the Austrian School of Economics, with which Hayek is associated. In his final evaluation, Gray describes some criticisms of spontaneous order theory, and, by accepting the libertarian critique of democracy, accepts that such processes can diminish as well as strengthen liberty. Nonetheless it remains a vital concept with respect to liberty because, under appropriate rules, it ends the zero sum character of social competition.

Habermas, Jürgen . Towards a Theory of Universal Pragmatics, *Communication and the Evolution of Society*, Boston: Beacon Press, 1979. 1-68.

In a very difficult essay, Habermas argues that the basic logic of communicative action is to reach understanding. As such, speech has a normative content focusing on validity claims of comprehensibility, truth, truthfulness, and rightness. This essay is of interest to the study of emergent order because first, language is itself such an order, second, human spontaneous orders arise from formally voluntary initiatives on the part of actors, and so can be said to have the same underlying normative foundations that Habermas explicates at the most fundamental level.

Hayek, F. A. The Use of Knowledge in Society, *Individualism and Economic Order*, Chicago: University of Chicago Press, 1948. 77-91.

Any complex society is characterized by widely dispersed knowledge. In economic terms, but easily applicable to other social spontaneous orders, Hayek argues the basic problem is securing "the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know."(78) Central is knowledge of particular circumstances which is local, cannot be entered into statistics, and which somehow needs to be communicated between members often ignorant of one another.

* _____. **Competition as a Discovery Procedure, *New Studies in Philosophy, Politics, Economics and the History of Ideas*, Chicago: University of Chicago Press, 1978. 179-190.**

This argument is also found in

* _____. **Government Policy and the Market, *The Political Order of a Free People*, vol. 3 of *Law, Legislation and Liberty*, Chicago, University of Chicago Press, 1979. 65-97.**

Competition can be rationally justified only when we do not know the outcome to which it would lead. Since competition exists to discover facts otherwise unknowable, it can not be tested empirically, only conceptually. Market competition is therefore similar to research in the scientific community. It is primarily a discovery procedure. While Hayek focuses on the market his arguments can be easily extended to any social spontaneous order.

* **Horowitz, Steven. *Of Human Action But Not of Human Design*, 1999 Frank P. Piskor Lecture, Canton, NY: St Lawrence University, 1999. 33 pp.**

Perhaps the best brief overview of spontaneous order theory, beginning with its roots in the Scottish Enlightenment, especially Adam Ferguson and Adam Smith, through Karl Menger and Hayek to contemporary applications not only in economics, but also law, linguistics, evolutionary psychology, high technology, and the biological sciences. Horowitz also applies its implications to how we understand other cultures and links it with work in the Weberian sociological tradition.

Lachmann, Ludwig M. *The Legacy of Max Weber*, Berkeley: The Glendessary Press, 1971. 144 pp.

Lachmann builds on Weber's work to develop a theory of social institutions distinguishing between those which are designed and those undersigned institutions growing from continual social practice. These latter are, of course, emergent orders. Weber himself never developed such a general theory, but Lachmann argues there are the seeds of such a theory present there. Also of interest is his discussion of Weber's relationship to Karl Menger. The book's second chapter is perhaps the most important in terms of emergent orders.

Laszlo, Ervin. *The Systems View of the World*. New York: George Braziller, 1972. 120 pp.

One of the principle theorists of general systems theory, Laszlo offers an introductory outline of systems theory as it was conceived in 1972. Interesting for the purposes of this bibliography is the indistinct recognition of the importance of self-organization, or what Laszlo terms "self-creativity." He explicitly recognizes it in the natural world and in a general way in the social world, but conflates hierarchies among natural systems, which have nothing to do with deliberate control, with hierarchies in social systems, where the examples he uses are from business and government, and are organized as control hierarchies. Compare pp. 46-8 with pp. 72-4.

Macy, Joanna. *Mutual Causality in Buddhism and General Systems Theory* Albany: State University of New York Press, 1991. 220 pp.

Macy uses general systems theory and Buddhist philosophy to illuminate the concept of mutual causality. Briefly, causality is best conceived not linearly, but in terms of dynamic interdependence. In Buddhist terms this is called "dependent co-arising." In covering systems theory, Macy relies on the work of von Bertalanffy and Laszlo and their concept of "cybernetics II" in developing her analysis of systems theory. "Cybernetics II" allows for internal change within the system via its reaction to feedback, and so is self-organizing and emergent, whereas the original concept of cybernetics did not. Chapters 10 and 11 are perhaps most central to the concerns of this bibliography.

Petsoulas, Christina. *Hayek's Liberalism and its Origins, his idea of spontaneous order and the Scottish Enlightenment*. Routledge, 2001. 208 pp.

Petsoulas contrasts Hayek's evolutionary theory, based upon the unconscious adoption of successful traditions, with a model of conscious and rational adaptation based on trial and error, found in Mandeville, Hume and Smith. The author is particularly critical of Hayek's evolutionary theory which appears to require the existence of certain rules in order to generate a spontaneous order. Unlike the price system, rules of just

conduct are 'neither generated nor maintained spontaneously'. The argument running through it is strong though dependent on too strict a reading of Hayek's theory in my opinion.

- Contributed by Mark Koyama

Polanyi, Michael. *The Logic of Liberty*, Indianapolis: Liberty Fund, 1998. 277 pp.

A classic study of spontaneous order by a chemist who increasingly studied social and political issues. Polanyi focuses on intellectual spontaneous orders such as science and common law, which are sustained by "public liberty." Public liberty is characterized by involvement within public institutions capable of generating spontaneous orders. His argument includes demonstrating the logic superiority of polycentric compared to centralized problem solving in complex conditions and exploring the values underlying systems of spontaneous order.

_____. ***Personal Knowledge*. Chicago: University of Chicago Press, 1958. 405 pp.**

Polanyi develops his concept of "tacit knowledge" which is particularly important for deeper understandings of why emergent social orders can make use of knowledge that is unavailable to centralized direction. Using a variety of examples, Polanyi shows that all skills and other knowledge depend on underlying levels of knowledge which themselves are not consciously known. Such knowledge can be consciously known, but only by relying on still deeper levels which are not.

Resnick, Mitchel. *Turtles, Tewrmities, and Traffic Jams: Exp0lorations in Massively Parallel Microworlds*, Cambridge: MIT Press, 1999. 156 pp.

Resnick's book as a whole focuses on the use of the self-organizing computer program, StarLogo, in education, an interesting subject but removed from the focus of this list. However, several chapters are relevant, particularly 4, and 5, which explore why people have a difficult time comprehending self-organizing processes, tending instead towards thinking of order as the result of some central authority or command, or perhaps a "seed" which initiates change. Resnick suggests that the StarLogo programs are an effective way for students and others to grasp how sometimes self-organizing processes are more effective than central control.

Schelling, Thomas. *Micromotives and Macrobehavior*, New York: W. W. Norton, 1978. 243 pp.

Schelling does not for the most part describe spontaneous or emergent orders in the sense used by this bibliography. His book is useful in part because he does describe how unexpected patterns can arise from individuals pursuing their own ends. The differences between Schelling's examples and the subjects covered by the rest of this bibliography are interesting and important. (Schelling himself differentiates his examples from the market, though he seems to lump them together under the category of macrobehavior arising from micromotives.) First, the patterns arising from Schelling's examples, such as how a neighborhood becomes segregated or how on coming traffic slows down into a traffic jam when a collision occurs in opposite lanes, generally become less complex over time. Emergent orders as defined in this bibliography become more so. Hence, Schelling's cases are at least arguably better handled through central control whereas the

opposite can be assumed to be the case with those analyzed in the other sources on this bibliography. Second, the results are largely negative from the standpoint of participants in the sense that the larger pattern interferes with their intentions, whereas in emergent orders the opposite is true. Third systemic communication is very rudimentary. Fourth, there is no entrepreneurial process. Thus, an understanding of Schelling's cases will deepen understanding of genuinely emergent complex orders.

Titles Not Yet Annotated

von Bertalanffy, Ludwig. *Perspectives on General Systems Theory*, New York: George Braziller, 1975.

Bianchi, Marina. Hayek's Spontaneous Order: The "Corect" versus the "Corrigable" Society, in Jack Birner and Rudy van Zijp, (eds) *Hayek, Co-ordination and Evolution: His Legacy in Philosophy, Politics, Economics and the History of Ideas*. London: Routledge, 1994. 232-51.

Dyke, C. *The Evolutionary Dynamics of Complex Systems: A Study in Biosocial Complexity*. New York: Oxford University Press, 1988. 151 pp.

Fehl, Ulrich. Spontaneous Order in Peter J. Boettke (ed.) *The Elgar Companion to Austrian Economics*, Aldershot, UK: Elgar, 1994. 197-205.

Fleetwood, S. Order Without Equilibrium: A Critical Realist Interpretation of Hayek's Notion of Spontaneous Order, *Cambridge Journal of Economics*, 20:6. 729-747.

Foss, Nicolai Juul. Spontaneous Social Order: Economics and Schutsonian Sociology, *American Journal of Economics and Sociology*. 55:1, January, 1996. 73-86.

Haller, Markus. "Carl Menger's theory of invisible-hand explanations" *Social Science Information* 39(4), 2000, pp. 529-565

Howard, Ron. *Agoric*, (unable to locate so far)

Jewkes, John. *The Sources of Invention*, New York: W. W. Norton, 1971

Keegan, John. *The Face of Battle*, New York: Viking Press, 1995.

Kley, Roland. *Hayek's Social and Political Thought*, Oxford: Oxford University Press, 1994. 248 pp.

_____. Hayek's Idea of a Spontaneous Social Order – A Critical Analysis, *Kölner Zeitschrift für Sociologie und Sozialpsychologie*, 44:1, 1992. 12-34.

Luhmann, Nicolas. *Social Systems*. Stanford: Stanford University Press, 1995. 627 pp.

Menger, Karl. *Investigations into the Method of the Social Sciences with Special Reference to Economics*, New York: New York University Press, 1985. 237 pp.

Morson, Gary Saul and Caryl Emerson. *Mikhail Bakhtin: Creation of a Prosaics*. Stanford: Stanford University Press, 1991. 530 pp.

Zimmerman, Carl. *Successful American Families*, (unable to find so far)

2. ANTHROPOLOGY and emergent order

Bateson, Gregory. *Steps to an Ecology of Mind: A Revolutionary Approach to Man's Understanding of Himself*, New York: Ballentine Books, 1972. 505 pp.

Trained as an anthropologist, Bateson's book spills into many different fields. While using terminology wedded to the cybernetic model of homeostasis rather than emergent order, his arguments go beyond those concepts, and are highly relevant to this bibliography. Bateson writes penetratingly about the complex interaction of different levels of systems, particularly the human mind, society, and nature. He provides a description of the problems of subjecting such systems to instrumental control of which the famous critique of central planning becomes a single, albeit important, example. Also important here is his discussion of the relationship of ethics to systems theory. See particularly pp. 426-505.

Rappaport, Roy. *Pigs for the Ancestors* 2nd ed., New Haven: Yale. New printing by Waveland Press, 2000. 501 pp.

It is a classic case study of human ecology in a tribal society, particularly the place of religion and ritual in resource management. Rappaport applies systems theory and feedback analysis to an anthropological population. A major theoretical work grounded in extensive field work and empirical analysis.

_____. *Sanctity and Adaptation, Io/7 Oecology Issue*, 1970. Reprinted in Richard Grossinger, ed., *Ecology and Consciousness*, Richmond, CA: North Atlantic Books, 1978. 30 pp.

As human beings rose to ecological dominance they simplified their environments, with potentially serious ecological implications. Ritual enabled sustainable practices within ecological contexts far too complex for rational control and management. Respect proved better able to sustain viable societies than rational ideals of knowledge and control. Building on these anthropological studies, Rappaport argues for the importance of developing models of social self-organization and adaptation capable of comprehending the complexities of the modern world.

Titles Not Yet Annotated

Cronk, Lee. *That Complex Whole*, Westview Press, 1999.

Moore, Sally F. *Law as Process: An Anthropological Approach*. London, Henley, and Boston: Routledge and Kegan Paul. 1978.

Rappaport, Roy. *Ritual and Religion in the Making of Humanity*. Cambridge: Cambridge University Press, 1999. 480 pp.

Rappaport, Roy. *Ecology, Meaning and Religion*. 2nd ed. Berkeley: North Atlantic Books, 1988.

Roberts, Simon. *Order and Dispute: An Introduction to Legal Anthropology*. New York: Penguin. 1979.

_____, "The Study of Dispute: Anthropological Perspectives," *Disputes and Settlements: Law and Human Relations in the West*. John Bossey, ed. Cambridge: Cambridge University Press. 1983.

3. ETHICAL DIMENSIONS of emergent orders (see also No. 21)

Bateson, Gregory. *Steps to an Ecology of Mind: A Revolutionary Approach to Man's Understanding of Himself*, New York: Ballantine Books, 1972. 505 pp.

Trained as an anthropologist, Bateson's book spills into many different fields. While using terminology wedded to the cybernetic model of homeostasis rather than emergent order, his arguments go beyond those concepts, and are highly relevant to this bibliography. Bateson writes penetratingly about the complex interaction of different levels of systems, particularly the human mind, society, and nature. Important here is his discussion of the relationship of ethics to systems theory. See particularly pp. 426-505.

_____. ***Mind and Nature: A Necessary Unity*, New York: Bantam, 1980. 248 pp.**

Bateson develops the concept of logical typing, ignorance of which has led to many types of confusion. This concept is important when considering the ethical implications of systems theory and emergent order growing out of the actions of its participants (as well as of explanation in general). For example, see pp. 164, 192. Hayek's critique of "social justice" critiques errors in logical typing..

*** diZerega, Gus. Market Non-neutrality: Systemic Bias in Spontaneous Orders. *Critical Review*, 11:1, Winter, 1997.**

Among theorists of self-organization in the market, a primary assumption is that it serves primarily as a neutral transmission means for coordinating and enabling contractual exchange. DiZerega argue this is misleading. Any system of procedural rules, including those of market contract, incorporate value biases which can be different from the values of those operating within that system. Success can be defined either in terms of the

individual attaining his or her ends, or in systemic terms as acquiring resources defined by the system itself. Those whose values are most in keeping with the underlying biases of systemic rules will tend to do better under such systems than will others. Thus, while traditional models of social justice were effectively critiqued by Hayek (below), the concept still has relevance within the different conceptual world of the interaction spontaneous social orders with one another, and with the individuals whose actions generate them

*** Hayek, F. A. *The Mirage of Social Justice. Vol. 2 of Law, Legislation and Liberty, Chicago: University of Chicago Press, 1976, 191 pp.***

Hayek offers a powerful argument that traditional applications of standards of justice and desert based on individual relationships to the market, and by extension, other spontaneous orders, evidence a radical confusing of two differing systems of human interaction. One is based on the concrete and foreseeable effects, the other on abstract rules and unforeseeable effects. Our usual concepts of justice apply only to the first. Outcomes from spontaneous orders which impact on individuals can be described neither as just nor as unjust. A broader description of this distinction is Bateson's concept of logical typing.

Hock, Dee. *Birth of the Chaordic Age, San Francisco: Berrett-Koehler Pub., 1999. 331 pp.*

Dee Hock is founder and first CEO of VISA International, perhaps the world's largest commercial enterprise. Rather intuitively, Hock utilized the implications of incorporating emergent principles into business to achieve his success. One major theme in his book is a focus on the ethical implication of applying what he terms "chaordic" principles to organizational life. Chaordic is Hock's term for processes combining both chaos and order, in other words, self-organizing or emergent processes.

Jacobs, Jane. *Systems of Survival: A Dialogue on the Moral Foundations of Commerce and Politics, New York: Vintage, 1994. 234 pp*

Written in the form of a Socratic dialogue, this book is an exploration of the differences between "guardian" and "Commercial" ethical "syndromes." By the latter term Jacobs refers to each being an inter-connected ethical way of life. The latter she attributes to governments, the former to the commercial world, each broadly defined. (I suggest an alternative reading that sees the guardian syndrome being the ethics of instrumental organizations, including corporations, whereas the commercial syndrome applies to self-organizing processes.) Jacobs argues that attempts to apply standards, values, and practices from one syndrome to another can lead to "monstrous hybrids".

*** Rolston, Holmes III. "Duties to Ecosystems" in J. Baird Callicott, ed., *Companion to a Sand County Almanac, U. of Wisconsin, 1987. pp. 246-74.***

An extraordinary essay on environmental ethics - sounds in many ways almost like a translation of Hayek into ecology. But I am told that when he wrote it he was unaware of Hayek's work. Rolston explores there being several levels of ethical relationships, and that a system which makes ethically valuable beings possible is itself of ethical value even though events which are desirable at the systemic level may be morally

objectionable at the individual level. In this sense Rolston's work is an interesting correlation with Hayek's work critiquing social justice because what happens at the level of a social spontaneous order may be necessary whereas if the same events were deliberately done at the level of individual action, they would be morally objectionable.

Shapiro, Andrew L. *The Control Revolution*, New York: Public Affairs, 1999. 271 pp. See especially pp. 199-207.

This volume is an analysis of the internet and its impact on society and politics. However, chapter 19: "In Defense of Accidents (Order and Chaos)" pp. 197-207 makes an argument I have not encountered elsewhere, one with potentially significant implications on the ethical dimensions of emergent orders. Shapiro questions the desirability of the ideal that individuals can use the net to completely customize the information they receive. He argues that "too much order may be as dangerous to public life and personal well-being as too much chaos." (p. 200) In contrast to the common assumption that the self is a discrete unit with clear preferences Shapiro suggests that it flourishes in an environment where it will encounter unexpected information it later decides is important – information that can change that self. In a sense, the attempt by the self to plan its environment is subject to similar problems as the attempt to plan and control other complex adaptive systems.

Titles Not Yet Annotated

Robert, Axelrod. An Evolutionary Approach to Norms, *American Political Science Review*, 80. 1095-1111.

Heath, Eugene. On the Normative Implications of a Theory of Spontaneous Social Order, in J. T. Fraser, Marlene P. Soulsby and Alexander J. Argyos, (eds.) *Time, Order, Chaos: The Study of Time, IX*. Madison, CN: International Universities Press, 1998. 125-34.

Nowak, M. A. and R. M. May, The Arithmetics of Mutual Help, *Scientific American*, June, 1995. 76-81. (www.hehd.clemson.edu/complex/AnnotBib.htm)

**Rummel, R. J. *Saving Lives, Enriching Life: Freedom as a Right and a Moral Good*. 2001. On line book available at:
<http://www.hawaii.edu/powerkills/WF.COVER.HTM>**

4. HISTORY and emergent order

Quigley, Carroll. *The Evolution of Civilizations: An Introduction to Historical Analysis*, Indianapolis: Liberty Fund, 1979. 428 pp.

Quigley was among the first modern historian to argue that early civilizations' openness to innovation in intellectual, religious, military, social, economic, and political life, combined with encounters with other cultures, was the primary source for creative development often in unexpected ways. As these institutions became more closed and rigid, decline set in. Advance always required openness to the unexpected.

Diamond, Jared . *Guns, Germs and Steel*, New York: W. W. Norton, 1997. 457 pp.
An ecological history of human development focusing on the prerequisites for the rise of civilization and its interaction with the natural world. Feedback systems connected with domestication, agriculture, and disease were crucial factors in the rise of urbanized human cultures. The environmental conditions on the various continents, including whether they tend to extend east to west or north to south, turn out to have vital implications for how and when human societies developed beyond hunting and gathering. A fascinating example of “pattern predictions” as discussed by Hayek, Keller, and Kellert.

Rosenberg, Nathan and L. E. Birdzell, jr. *How the West Grew Rich: The Economic Transformation of the Industrial World*, New York: Basic Books, 1986. 335 pp.
The authors cover the rise of Western prosperity from the Middle Ages to modern times. They argue that neither imperialism nor exploitation caused its rise. Rather, historically unusual interrelationships between political and economic institutions freed many of the latter from control and direction, leading to unprecedented openness to innovation. Includes discussions of the differences and tensions between “political” and “economic” organizations, which in terms of this bibliography can be describes as hierarchical vs. self-organizing. Also offers an interesting discussion of differences between market and democratic decision making (p. 310).

Titles Not Yet Annotated

Geary, Patrick. "Living with Conflicts in Stateless France: A Typology of Conflict Management Mechanisms, 1050-1200," in his *Living with the Dead in the Middle Ages*. Ithaca: Cornell University Press. 1994.

Jones, E. L. *The Record of Global Economic Development*, Edward Elgar, 2002. 226 pp.

Jones, E. L. *The European Miracle: Environments, Economies, and Geopolitics in the History of Europe and Asia*. 2nd ed., Cambridge: Cambridge University Press, 1987. 3rd ed. Due May, 2003. 276 pp.

Jones, E. L. *Agriculture and thre Industrial Revolution*, John Wiley and Sons, 1975. 233 pp.

North, Douglas C. *Structure and Change in Economic History*, New York: W. W. Norton, 1981. 209 pp.

North, Douglas C. *The Economic Growth of the United States: 1790-1860*. New York: W. W. Norton, 1966. 291 pp.

Powelson, John P. *The Moral Economy*, Ann Arbor: University of Michigan Press, 2000. 296 pp.

Paul Heyne has a good review on Amazon.

Powelson, John P. and Richard Stock. *The Peasant Betrayed: Agriculture and Land Reform in the Third World*, Oelgeschlager, Gunn and Hain, 1987.

Foreign Language sources suggested by others (not annotated)

Althoff, Gerd. *Verwante, Freunde und Getreue: zum Politischen Stellenwert der Gruppenbindungen im Früheren Mittelalter*. Darmstadt: Wissenschaftliche Buchgesellschaft. 1990.

_____, *Spielregeln der Politik im Mittelalter: Kommunikation in Frieden und Fehde*. Darmstadt: Primus Verlag. 1997

5. LANGUAGE and emergent order

*** Adelstein, Richard . "Language Orders," 7 *Constitutional Political Economy* (Fall 1996), 221-238.**

Adelstein applies the concept of spontaneous order as applied in the debate over socialist calculation to the study of language. He discusses the evolution of complex systems of rules within natural languages and the dependence of artificial languages such as Esperanto on these natural languages, even at the cost of the rational principles these artificial languages were supposed to exemplify. He also analyzes the applicability of concepts used to describe spontaneous orders in economic theory to the very different field of linguistics. The related work of Smith, Chomsky and Pinker is also discussed.

Titles Not Yet Annotated

Lavoie, Don. Understanding Differently – Hermeneutics and the Spontaneous Order of Communicative Process, *History of Political Economy*, 22, 1990. 359-377.

6. LAW and emergent order

*** Hayek. F. A. chapters 16-18, in F. A. Hayek. *The Political Order of a Free People*. Vol. 3 of *Law, Legislation and Liberty*, Chicago: University of Chicago Press, 1976, 98-152.**

These chapters develop Hayek's institutional alternative to present day democratic polities, whereby the rule of law can be safely embedded within a democratic framework.

*** _____. The Rules of Just Conduct, chapter 8, in F. A. Hayek. *The Mirage of Social Justice*. Vol. 2 of *Law, Legislation and Liberty*, Chicago: University of Chicago Press, 1976, 31-61.**

This chapter offers an overview of Hayek's analysis of law and justice, including an incisive critique of legal positivism.

_____. **The Changing Concept of Law, Nomos: The Law of Liberty, and Thesis: The Law of Legislation, comprising chapters 4-6, in F. A. Hayek. *Rules and Order*. Vol. 1 of *Law, Legislation and Liberty*, Chicago: University of Chicago Press, 1973, 72-144.**

Hayek argues law is older than legislation, arising largely from custom and precedent. Nevertheless, on occasion legislation is necessary to correct problems arising from purely evolutionary law (a criticism of Leoni). He discusses the functions of a judge under such a legal system and how legislation is both necessary and quite different from such legal systems.

* _____. **Part II: Freedom and the Law, *The Constitution of Liberty*, Chicago: University of Chicago, 1960. 133-249.**

Hayek's most complete discussion of law as a grown order of rules that evolve rather than reflect an architectonic view of justice and society. Includes the origins of the rule of law, the contributions of American constitutionalism, and its uneasy relationship to political administration.

Horwitz, Steven. Spontaneity and design in the evolution of institutions: the similarities of money and law *Journal des Economistes et des Etudes Humaines*, Volume 4, No. 4 December 1993. 571-587.

After offering a general model of institutional development, Horwitz uses the evolution of customary law and money to demonstrate how tacit and complex knowledge can better be coordinated within evolutionary institutions rather than those deliberately created and controlled through central power. Several historical examples buttress his theoretical argument.

* **Leoni, Bruno. *Freedom and the Law*, 3rd edition, Indianapolis: Liberty Fund, 1991. 274 pp.**

Leoni makes perhaps the most powerful extended case that the common law tradition is superior to legislative law. Its spontaneous development through precedents gives it greater flexibility while limiting the damage that ill considered legal principles and legislation can do to human freedom and justice.

Trakman, Leon E. The Evolution of the Law Merchant: Our Commercial Heritage, *Journal of Maritime Law and Commerce* 12, (October, 1980) 1-24; 12 (January 1981) 152-182.

A survey of the Law Merchant from Medieval times to the present. The Law Merchant evolved as a stateless legal framework facilitating relationships and dealings between merchants internationally. It is a clear case of law evolving in a very complex and changing environment purely through the elaboration of the logic of contract, without the intervention of a legislature.

Titles Not Yet Annotated

Teubner, Gunther (ed.). *Global Law Without a State (Studies in Modern Law and Policy)*, Dartmouth Pub., 1997. 305 pp.

_____ (ed.) *Environmental Law and Ecological responsibility: The Concept and Practice of Ecological Self-Organization*. John Wiley and Sons, 1994. 411 pp.

Teubner, Gunther et. al., *Law as an Autopoietic System*. Blackwell Pub., 1993.

_____ (ed.). *Autopoietic Law*, Walter de Gruyter, Inc., 1988. 380 pp.

Benson, Bruce L. *The Enterprise of Law: Justice Without the State*, San Francisco: Pacific Research Institute for Public Policy, 1990.

Ellickson, Robert C. *Order without Law: How Neighbors Settle Disputes*. Cambridge, Mass. and London: Harvard University Press, 1991.

Fuller, Lon. *The Morality of Law*, New Haven: Yale University Press, 1969. 262 pp.

Hamowy, Ronald. Freedom and the Rule of Law in F. A. Hayek, *Il Politico*, 1971. pp. 340-77.

Moore, Sally F. *Law as Process: An Anthropological Approach*. London, Henley, and Boston: Routledge and Kegan Paul. 1978. 304 pp.

Ogus, A. I. Law and Spontaneous Order: Hayek's Contribution to Legal Theory, *Journal of Law and Society*, 16:4, 1989. 393-409.

Parisi, Francesco. Toward a Theory of Spontaneous Law, *Constitutional Political Economy*, 6:3, 1995. 211-31.

Roberts, Simon. *Order and Dispute: An Introduction to Legal Anthropology*. New York: Penguin. 1979. 216 pp.

_____, "The Study of Dispute: Anthropological Perspectives," *Disputes and Settlements: Law and Human Relations in the West*. John Bossey, ed. Cambridge: Cambridge University Press. 1983.

7. POLITICAL SCIENCE and emergent order

***Adelstein, Richard. "Charles E. Lindblom," in W. J. Samuels, ed., *New Horizons in Economic Thought: Appraisals of Leading Economists*, Edward Elgar, Cheltenham UK (1992), pp. 202-226.**

An excellent overview of the work of Charles Lindblom on the character of democratic politics. Lindblom is perhaps then first major political scientist who incorporated Hayekian spontaneous order insights – not necessarily explicitly – into the study of democratic politics. More critical of certain aspects of the market than Hayek, Lindblom nevertheless extended his insights about the advantages of nonhierarchical institutions, the limits of reason, piece-meal adaptation limited by feedback within a complex order, and how the democratic process enables adjustments that would be unlikely or impossible under deliberate direction. Also discussed, more critically, is Lindblom's critique of corporate influence within the American political system.

Crick, Bernard. *In Defense of Politics*, 4th ed., Chicago: University of Chicago Press, 1993. 272 pp.

Crick's concept of politics is in complete keeping with a spontaneous order analysis, but with no apparent awareness of the term or concept. A classic statement of politics as a discovery process. Written without any apparent awareness of the self-organizing model or the Hayekian focus on discovery, Crick's analysis is an independent discovery of their importance in politics.

Deutsch, Karl. *The Nerves of Government*, Free Press, 1963.

Deutsch's book was a pioneering attempt to apply cybernetic system theory to the study of politics. He did not work with a self-organizing model emphasizing discovery far from equilibrium, but rather one focusing on the political system's tendency to approach a hypothetical equilibrium. A book of substantial historical importance for intellectual background.

*** diZerega, Gus. "Liberalism, Democracy and the State: Reclaiming the Unity of Liberal Politics" *Review of Politics*, Fall, 2001.**

Traditional liberalism shattered into progressive and classical liberalism due to the growth of modern democracy and the rise of the industrial market economy. Both considered democracy to be a state when it is not. This error helps explain serious analytic and policy difficulties within both schools of liberal thought.

Excerpts can be found at www.dizerega.com under "Politics." Entire paper may be downloaded at <http://www.dizerega.libunity.pdf>.

*** _____ . *Persuasion, Power and Polity: A Theory of Democratic Self-Organization* Hampton Press, 2000.**

This is an in-depth discussion of how representative democracy can be most effectively understood as a spontaneous order. It includes analyses of traditional democratic theory, empirical studies of issues in contemporary democratic politics, and a discussion of how this framework gives new perspectives of issues of democratic reform. At this time it is the only book developing the democracy as spontaneous order thesis and exploring its implications within several areas of political analysis.

_____. **Federalism, Self-Organization, and the Dissolution of the State, *Telos*, no. 100, Summer, 1994. 57-86.**

The self-organizing systems model offers new insights on whether centralized or decentralized and federal democratic systems best serve the public interest. Democracies have fluid and open borders. Local self-governing institutions often have more in common with similar adjacent units in other countries. With growing complexity, the future of novel local self-governance is bright.

Excerpts can be found at www.dizerega.com under “Politics.” Entire paper may be downloaded at <http://www.dizerega.federal.pdf>. This argument is also present in diZerega, 2000.

_____. **Elites and Democratic Theory: Insights From the Self-Organizing Model. *Review of Politics*, June, 1991. 340-372.**

Much democratic research and theory concerns itself with elites. Their status is traditionally uneasy, always present but not quite legitimate. The self-organizing model helps better situate elites as a crucial but sometimes troubling element in complex democratic systems. In the process ruling elite theories are critiqued and pluralist theory elaborated upon.

Excerpts can be found at www.dizerega.com under “Politics.” Entire paper may be downloaded at <http://www.dizerega.com/elites.pdf>. This argument is also present in diZerega, 2000.

_____. **Democracy as Spontaneous Order, *Critical Review*, Spring, 1989. pp. 206-240.**

Classical liberal thinkers have long been distrustful of political democracy. Yet liberalization of societies has also involves their democratization. This paradox is resolved when we recognize that democracies are spontaneous orders like the other liberal institutions of science and the market.

Excerpts can be found at www.dizerega.com under “Politics.” Entire paper may be downloaded at <http://www.dizerega.com/demspol1.pdf>. This argument is also present in diZerega 2000.

Dobuzinskis, Laurent. The Complexities of Spontaneous Order, *Critical Review*, Spring, 1989. pp. 241-266.

Dobuzinskis argues that Hayek’s model of spontaneous order has been prematurely developed into an ideology of “Marketism.” He argues that Hayek’s focus on “negative freedom” impoverishes the concept by denying the importance of the public realm, which can also be a spontaneous order, and within which issues not easily addressed within the market can be confronted. Focusing on environmental issues and the tensions between subjects within spontaneous orders and the orders themselves, the author urges a less ideological and more subtle approach in making use of the concept.

_____. ***The Self-Organizing Polity: An Epistemological Analysis of Political Life*, Boulder, Colorado: Westview Press, 1987.**

Dobuzinskis’ pioneering work explores political self-organization at a more abstract level than other works in this section. He argues that political systems as a whole, and not just

democracies, are maintained through dynamic equilibrating processes enabling them to both maintain autonomy from other societal processes and adapt to challenges generated within and by them.

Frey, Bruno S. A Utopia? Government without Territorial Monopoly, *Independent Review*. V:1, Summer, 2001. 99-112.

Frey questions the notion that governments necessarily have territorial monopolies. Federal states where several governments share the same territory are evidence this is not so, as are other institutions he describes. He develops a FOCJ model of functional, overlapping, competing, jurisdictions, thereby creating a political equivalent to a market for citizens who have some powers to exit without moving as well as choosing officials in all relevant units. Frey gives historical examples of such approaches working effectively. American and Swiss federalism are examined for what they can teach in this area.

To access link to: http://www.independent.org/tii/content/pubs/review/tir61_frey.html

*** Hayek, F. A. *Law, Legislation and Liberty*, 3 volumes. Chicago: University of Chicago Press, 1973, 1976, 1979. 479 pp.**

Hayek's last work completed entirely by him. This treatise on political and social theory is intended by him to supplement the analysis in *Constitution of Liberty* and is the most complete analysis by him that specifically incorporates his concept of spontaneous order as its unifying theme.

_____. ***The Constitution of Liberty*, Chicago: University of Chicago, 1960. 531 pp.**

Hayek's most complete work of social, legal, and political theory. In terms of spontaneous order theory, the concept is primarily latent, in contrast to *Law, Legislation and Liberty*. However, the book as a whole is an attack on the ideal that experts of any sort can be relied upon safely to order complex human relations by overriding the judgments and freedom of others.

Heclo, Hugh. *Issue Networks and the Executive Establishment*, *The New American Political System*, Washington, DC: American Enterprise Institute, 1978. pp 87-124.

Heclo's classic essay describes the progressive dissolution of organized groups of interests dominating policy within "iron triangles" into "issue networks" which are open to influence from potentially any interested party. Illustrates a shift from looking at democratic politics in terms of the power of specific groups to a process where boundaries are open and power difficult to pinpoint.

*** Jacobs, Jane. *Cities and the Wealth of Nations*, New York: Random House, 1984. 244 pp.**

In the absence of political boundaries brought about by force of arms or its threat, cities are the "natural" units of modern human societies. They develop spontaneously, and as they do gradually transform their surroundings into complex webs of social cooperation far beyond urban boundaries, unless exploited by centralized political authority.

* **Kingdon, John. *Agendas, Alternatives and Public Policies*. 2nd. ed., New York: Longman, 1995. 244 pp.**

Kingdon's study of how issues arrive on the public agenda offers a careful study of the democratic discovery process. Case studies illustrate the processes he describes. While unaware of the similarities of the process he describes to spontaneous order models, Kingdon ultimately uses the term "ordered anarchy" to describe the process he analyses.

Lindblom, Charles. *The Science of Muddling Through*, *Public Administration Review*, 14, Spring, 1959, pp. 79-88.

Lindblom's classic paper develops his model of "partisan mutual adjustment" which is remarkably similar to the Austrian theory of entrepreneurship as developed by Israel Kirzner. Lindblom describes a process of continual partial adaptation on the part of public agencies.

Ostrom, Vincent. *The Meaning of American Federalism: Constituting a Self-Governing Society*. San Francisco: Institute for Contemporary Studies, 1991. 277 pp.

Ostrom offers a wide ranging analysis, from Tocqueville and Hobbes through the development of the contemporary American system. Of particular interest to this list is his chapter 9: "Polycentricity: The Structural Bias of Self-Governing Systems" (pp. 223-248). Ostrom uses self-governing and self-organizing more interchangeably than do other authors cited in this section.

Page, Benjamin I. and Robert Y. Shapiro. *The Rational Public: Fifty Years of Trends in Americans' Policy Preferences*, Chicago: University of Chicago Press, 1992.

Opinion polls demonstrate that most citizens know very little about politics. Nevertheless, Page and Shapiro argue that public opinion is *more* rational than the views of individual members of the public, and the record of American government in responding to public opinion is quite strong, without the public necessarily being aware of this responsiveness. A strong study of rational order arising without deliberate planning.

Wohlgemuth, Michael. *Democracy and Opinion Falsification: Towards a New Austrian Political Economy*, *Constitutional Political Economy*, Vol.13(3), Summer, 2002. 223-246

Titles Not Yet Annotated

Wohlgemuth, Michael. *Economic and Political Competition in Neoclassical and Evolutionary Perspective*, *Constitutional Political Economy*, 6:1, Winter, 1995. 71-96.

8. INTERNATIONAL RELATIONS and emergent order

diZerega, Gus. *Democracy and Peace: The Self-Organizing Foundation of the Democratic Peace*. *Review of Politics*, 57:2, Spring, 1995. 279-308.

Alone among human societies, democracies do not fight wars with others of their own kind. The reason is because they are self-organizing systems rather than instrumental hierarchies, like undemocratic states. Alternative approaches such as Waltz's use of systems theory are critiqued.

Excerpts can be found at www.dizerega.com under "Politics." Entire paper may be downloaded at <http://www.dizerega.peace.pdf>. This argument is also present in diZerega, 2000.

Meade, Walter Russell. *Special Providence: American Foreign Policy and How it Changed the World*, Knopf, 2002. 374 pp.

Criticizing the usual view of American foreign policy as frequently inept, Meade suggests the twists and turns and seeming inconsistencies that characterize democratic foreign policy are actually very adaptive and consistent with long term American national interest. Meade distinguishes between four competing approaches using simplified but revealing labels: Hamiltonians, Jeffersonians, Wilsonians, and Jacksonians. Their complex interplay is responsible for the success of American foreign policy.

Ray, James Lee. R.J. Rummel's Understanding Conflict and War: An Overlooked Classic? *Conflict Management and Peace Science*, 16:2, Fall, 1998. 125-147.

Ray offers an overview of Rummel's work on conflict, which exceeds in scope his emphasis on the democratic peace. Rummel's *Understanding Conflict and War* develops 33 inter-related propositions concerning the causes of conflict. Among the more surprising of Rummel's findings are that international relations are a libertarian exchange society which tends to be more peaceful than domestic politics and that international law is more effective than national law. Further, democracies are correlated with greater peace not only with one another but also when being only one party in a potential conflict. Ray shows that recent research supports Rummel's findings and that his theoretical model suggests a promising alternative to rational choice and formal modeling for understanding international conflict.

*** Rummel, R. J. Home site: Freedom, Democracy, Peace, Power, Democide, War.**

Rummel's home site offers an enormous variety of information and sources developing his research into the peaceful character of democracies compared to other forms of government. An invaluable research tool in this field. It may be accessed at www.hawaii.edu/powerkills/

*** _____ . *Power Kills: Democracy as a Method of Nonviolence*. New Brunswick, US: Transaction, 1997.**

Rummel is perhaps the earliest contemporary pioneer of the argument that democracies differ from other governments because they are radically less violent. No democracy has ever fought a war with another and are internally substantially more peaceful as well. Further, Rummel documents this argument with sophisticated statistical studies once ignored but now increasingly acknowledged. In studying why democracies are so much less prone towards collective violence, Rummel developed the concept of a "social field", a spontaneous order, and the "antifield", a political attempt to override such orders.

Titles Not Yet Annotated

Rummer, R. J. *Understanding Conflict and War, vol. 2: The Conflict Helix*. Sage Publications.

9. URBAN ISSUES and emergent order

*** Jacobs, Jane. *The Death and Life of Great American Cities*, New York: Vintage, 1961.**

A classic in urban studies. In terms of this list the most important element in her book is her discussion of urban neighborhoods as complex social networks in continual flux, but which when allowed to develop on their own perform important order and prosperity encouraging functions without the intervention of outside authority.

*** _____ . *Cities and the Wealth of Nations*, New York: Random House, 1984. 244 pp.**

Jacobs argues the city is basic unit of social and economic organization growing from peaceful interaction. They are usually parasitized by nation states and earlier large political forms. Yet important replacing cities are, Jacobs argues, the basic wealth creating units within a nation. The result is a contradiction between the exigencies of national politics and its dependency on cities as wealth creators. The solution Jacobs argues for is the "multiplication of sovereignties" by natural division. (214-5) A powerful and fascinating application of emergent order thinking by one of its most innovative pioneers.

Ostrom, Vincent, Charles M. Tiebout, and Robert Warren. *The Organization of Government in Metropolitan Areas: A Theoretical Inquiry*, in Vincent Ostrom, *The Meaning of American Federalism: Constituting a Self-Governing Society*. San Francisco: Institute for Contemporary Studies, 1991. pp. 137-161.

Titles Not Yet Annotated

Ostrom, Vincent, Robert Bish, and Elinor Ostrom. *Local Government in the United States*, San Francisco: Institute for Contemporary Studies Press, 1988. 244 pp.

10. SOCIOLOGY AND PHILOSOPHY OF SCIENCE and emergent order

Hull, David. *Science as a Process: An Evolutionary Account of the Social and Conceptual Development of Science*, Chicago: University of Chicago, 1998. 522 pp.

Hull appears completely unaware of Polanyi's work, but his book is a fascinating "rediscovery" of the self-organizing processes within science via careful case studies in biology.

Michael Polanyi: *The Logic of Liberty*, Indianapolis: Liberty Fund, 1998. 277 pp. Particularly important here is chapter 4 “Self-Government of Science.” Describes how the individual scientist, the scientific community as a whole, and the general public all participate in the development of science as a whole. Includes a discussion of political attempts to control science in Nazi Germany and the Soviet Union. Chapter 5 discusses the differences between pure and applied science and chapter 6 a brief critique of attempts to plan science. The bulk of the book makes the case for polycentric self-organization over central control generally.

* _____ . ***The Republic of Science, Knowing and Being: Essays by Michael Polanyi*, edited by Marjorie Grene, Chicago: University of Chicago Press, 1969. 49-72.**

A classic essay on how the scientific community is self-organizing. Polanyi emphasizes that scientists can do effective work only within the context of a established community of peers committed to common values.

Titles Not Yet Annotated

Toulmin, Stephen. *Human Understanding: The Collective Use and Evolution of Concepts*. Princeton: Princeton University Press, 1972. 520 pp.

* **Ziman, John. *Public Knowledge* Cambridge: Cambridge University Press, 1968. 147 pp.**

Ziman further develops the argument Polanyi advanced in “The Republic of Science.”

_____. ***Reliable Knowledge*, Cambridge: Cambridge University Press,**

11. CIVIL SOCIETY, THE THIRD SECTOR and emergent order

Cornuelle, Richard. *The Power and Poverty of Libertarian Thought*, *Critical Review*, 6:1, Winter, 1992. 1-10.

Cornuelle argues that libertarian theory has done a good job making the case for a market order rather than central planning or extensive intervention. In many ways it has won this battle both intellectually and politically. But the general lack of a compelling vision of community or freedom in the workplace hinders its capacity to challenge government social legislation. Nevertheless the extent of voluntary nonmarket social processes is enormous, and needs theoretical attention.

_____. ***Reclaiming the American Dream: The Role of Private Unindividuals and Voluntary Associations*, New York, 1965. 199 pp.**

A seminal description of the “independent sector” which is neither government nor economic in the usual senses of those terms. Cornuelle argues that this sector is capable of performing most public functions better than either government or profit-oriented enterprises. A pioneering study of this issue.

diZerega, Gus. Part III: A Theory of Contractual Federalism, of *Persuasion, Power and Polity: A Theory of Democratic Self-Organization* Hampton Press, 2000. pp. 249-357

DiZerega argues that the institutional framework of coercive democratic bodies tends to undermine democratic values. Adapting property rights theory to the analysis of democratic and public values, he argues that decentralized citizens' cooperatives rooted that now are allocated to traditional democratic polities.

Tocqueville, Alexis. *Democracy in America*, vol. I., New York: Schocken Books, 1961.

Volume one of *Democracy in America* contains several descriptions of Tocqueville's finding order where initially chaos and confusion abound in a political and social system without over arching control, as "The appearance of disorder which prevails on the surface, leads him [a European visitor] at first to imagine society is in a state of anarchy; nor does he perceive his mistake until he has gone deeper into the subject." (p. 89) It also teems with descriptions of how voluntary cooperation, and not just in economics, creates more than attempts to order and control human affairs.

Titles Not Yet Annotated

Bates, Robert H. *Prosperity and Violence: The Political economy of Development*, New York: W. W. Norton, 2001. 128 pp.

Cornuelle, Richard. *Healing America*. New York: G. P. Putnam's Sons, 1983.

Hayek, F. A.

Marty, Martin E. Association over Community, *The One and the Many: America's Struggle for the Common Good*, Cambridge: Harvard University Press, 1997.

Oakshott, Michael.

Smith, David Horton. *Grassroots Association*.

Maybe social capital people

12. ECOLOGY and emergent order

Rolston, Holmes III. "Duties to Ecosystems" in J. Baird Callicott. ed., *Companion to a Sand County Almanac*, U. of Wisconsin, 1987.

A deceptively complex essay on environmental ethics which must be read carefully to distinguish Rolston's position from those he criticizes. Rolston's argument sounds in many ways almost like a translation of Hayek into ecology. But I am told that when he wrote it he was unaware of Hayek's work.

* _____ . *Environmental Ethics*, Philadelphia: Temple University Press, 1988.
A later and more developed explication of the same argument as in “Duties to Ecosystems”, developed in the context of an overarching environmental ethic.

* **Rothschild, Michael.** *Bionomics: Economy as Ecosystem*, New York: Henry Holt, 1990. 408 pp.

A very clear argument illustrating the profound similarities between modern ecological and evolutionary theory with market theory and economic history. A major difference is how information flows through markets and biological systems, where the latter moves genetically the former can combine and recombine in many different seemingly unconnected ways. A wealth of examples flesh out the theoretical argument. Rothschild emphasizes the many points of similarity but does not explore the interrelationship of market and ecological processes.

Worster, Donald. *Nature’s Economy: A History of Ecological Ideas*, Cambridge: Cambridge University Press, 1977. 377 pp.

Worster’s history makes frequent reference to the interrelationship between ideas about economics and economies and ideas about ecology. For readers already well versed in the concept of emergent or spontaneous orders this offers an illuminating approach to viewing ecological science. Without such prior acquaintance the book remains very interesting but will not, on its own, help the reader with respect to the subject of this list.

13. ECOLOGICAL POLICY and emergent order

* **Bromley, David (ed.)** *Making the Commons Work: Theory, Practice, and Policy*, San Francisco: Institute for Contemporary Studies, 1992. 318 pp.

The commons are traditionally considered the form of ownership least able to maintain sustainable practices. Bromley’s volume offers case studies from Asia, Europe, Latin America, and Africa suggesting that decentralized self-governance by communities of stakeholders can, in fact, practice sustainable management, sometimes for many hundreds of years. The volume concludes with a general theoretical piece by Elinor Ostrom, “Rudiments of a Theory of Common Property Institutions” pulling together the insights offered by these case studies.

_____. **Sustainable Communities: Self-Organization, Politics, and Gore's Environmental Marshall Plan,"** in *Goring the Earth: A Constructive Response to Earth in the Balance*, San Francisco: Pacific Research Institute, 1994, pp. 227-248.

DiZerega argues that while the problem of developing sustainable practices in modern society is quite real, attempts to design and enforce such strategies are ill-advised, both because they require more knowledge of environmental circumstances than is likely to be centrally known, and because they misunderstand the character of democratic politics. Al Gore’s proposal for an “Environmental Marshall Plan” is analyzed to illustrate these arguments.

Hess, Karl. *Visions Upon the Land: Man and Nature on the Western Range*, Washington: Island Press, 1992. 272 pp.

Using the Western range as a case study, Hess argues that local accommodations to ecological circumstances have proven superior both to the Jeffersonian and Progressive public policy “visions” implemented by government and to the attempt to replace these architectonic visions with a new “environmental” vision. Hess concludes with a detailed proposal on eliminating central control over public lands democratically, and in a way, he argues, that will maximize both ecological and social diversity and sustainability.

*** Ostrom, Elinor. *Self-Governance and Forest Resources*, Center for International Forestry Research, Jakarta, Indonesia, Feb. 1999. 15 pp.**

Go to <http://www.cifor.cgiar.org/> search for Ostrom, Occasional Paper No. 20.

Conventional theories applied to forest resources presumed that forest users themselves were incapable of organizing to overcome the temptations to overharvest. Extensive empirical research, however, challenges this theory and illustrates the many ways forest users themselves devise rules that regulate harvesting patterns ensuring long term sustainability. There is now a large body of literature analysing common-pool resources such as many fisheries, irrigation systems and rangelands. A growing consensus exists in this literature concerning the attributes of common-pool resources and of resource users that enhance the probability that self-organization will occur. Many of these attributes seem also to help predict when forest users will self-organize.

*** _____ . *Governing the Commons: The Evolution of Institutions for Collective Action*, New York: Cambridge University Press, 1990. 244 pp.**

Ostrom argues from a number of careful studies that common pool resources are often best managed not through central control, but rather when appropriators themselves develop institutional frameworks to solve the problems they confront. Such solutions fit neither traditional public nor private property models. The evidence is they cannot be imposed but must be developed by appropriators themselves when certain enabling conditions are met. She criticizes leading models of collective action, arguing they give scholars and policy makers unwarranted illusions of knowledge of complex phenomena where local knowledge and autonomy can make the difference between success and failure.

Titles not yet Annotated

diZerega, Gus. “Rethinking the Obvious: Modernity and Living Respectfully With Nature,” *The Trumpeter: Journal of Ecosophy*, Winter, 1997.

_____. “Towards an Ecocentric Political Economy” *The Trumpeter*, Fall, 1996.

14. RELIGION and emergent order

Berger, Peter. *A Far Glory: The Quest for Faith in an Age of Credulity*. New York: Anchor, 1992. 218 pp.

Particularly chapters 1 : “Secularization and Pluralism” and 3 “The West and the Challenge of Cultural Pluralism” continue Berger’s analysis of religion in an open and competitive environment, though this colors the entire volume. Berger is unusual in being a major sociologist who takes religion seriously as an ever present dimension of the world, and does not try and reduce it to psychological explanations. At the same time, his analysis is of a kind of emergent order in that practices and institutions characteristic of liberal modernity, especially the market and liberal politics, act back upon themselves, transforming the contexts of those acting within them.

_____. *A Rumor of Angels: Modern Society and the Rediscovery of the Supernatural*. Expanded ed., New York: Doubleday, 1990. 187 pp.

Building on themes developed in *The Sacred Canopy*, Berger continues his analysis of religious pluralism in the modern world. With respect to this bibliography, chapters 2 :The Perspective of Sociology: Relativising the Relativizers,” 4: “Theological Possibilities: Confronting the Traditions”, and 7: “From Secularity to World Religions” are particularly relevant.

_____. *The Sacred Canopy: Elements of a Sociological Theory of Religion*, Garden City, NY: Doubleday, 1969. 205 pp.

In chapters 5-7 Berger’s analyzes the process of secularization and its impact. Modern political authority now takes a stance towards religion similar to its stance towards markets, allowing for plurality and competition. Religious groups compete with one another and with non-religious rivals “in the business of defining the world.”(137) Consequently, “religious institutions become marketing agencies and the religious traditions become consumer commodities.” (138) Berger then analyzes the impact such a context has on the character of religious institutions.

Macy, Joanna. *Mutual Causality in Buddhism and General Systems Theory: The Dharma of Natural Systems*, Albany: State University of New York Press, 1991. 220 pp.

Macy uses general systems theory and Buddhist philosophy to illuminate the concept of mutual causality. Briefly, causality is best conceived not linearly, but in terms of dynamic interdependence. In Buddhist terms this is called “dependent co-arising.” In covering systems theory, Macy relies on the work of von Bertalanffy and Laszlo and their concept of “cybernetics II” in developing her analysis of systems theory. “Cybernetics II” allows for internal change within the system via its reaction to feedback, and so is self-organizing and emergent, whereas the original concept of cybernetics did not. She argues these concepts are in harmony with core Buddhist precepts as to the nature of mind and body, boers and deeds, and imply similar ethical concepts.

Wilber, Ken. *Sex, Ecology, Spirituality*, Boston: Shambhala Pub., 2000. 832 pp.

The first part of Wilber’s book would be of particular interest, where he develops an “all level all quadrant” integral model integrating theories of emergent systems with other fields of knowledge, and arguing that only by including what we usually term spiritual dimensions of existence can we develop a genuinely integral and inclusive framework for

knowledge and experience. Wilber is a major figure in efforts to reconcile the achievements of modernity with humankind's varied spiritual traditions.

Titles not yet Annotated

Rappaport, Roy. *Ritual and Religion in the Making of Humanity*. Cambridge: Cambridge University Press, 1999. 480 pp.

Rappaport, Roy. *Ecology, Meaning and Religion*. 2nd ed. Berkeley: North Atlantic Books, 1988.

15. ECONOMICS

Lachmann, Ludwig. *The Market as an Economic Process*, (Oxford: Basil Blackwell, 1986. 165 pp.

16. INTERNET, COMPUTERS and emergent order

Resnick, Mitchel. *Turtles, Termites, and Traffic Jams: Explorations in Massively Parallel Microworlds*, Cambridge: MIT Press, 1999. 156 pp.

Resnick's book as a whole focuses on the use of the self-organizing computer program, StarLogo, in education, an interesting subject but removed from the focus of this list. However, several chapters are relevant, particularly 4, and 5, which explore why people have a difficult time comprehending self-organizing processes, tending instead towards thinking of order as the result of some central authority or command, or perhaps a "seed" which initiates change. Resnick suggests that the StarLogo programs are an effective way for students and others to grasp how sometimes self-organizing processes are more effective than central control.

Shapiro, Andrew L. *The Control Revolution: How the Internet is Putting Individuals in Charge and Changing the World We Know*, New York: Century Foundation, 1999. 271 pp.

Shapiro's volume explores the impact of the internet on society and politics. Examining both positive and potentially disturbing impacts, the volume is excellent in its discussion of the interaction of complex adaptive systems with instrumental organizations within them that seek to control and manipulate them. This, of course, has implications beyond the subject of Shapiro's volume. Chapter 19 also offers an interesting observation on why complete control of information by those who receive it may not be desirable. (See entry in "Ethical Dimensions.")

Lessig, Lawrence. *The Future of Ideas: The Fate of the Commons in a Connected World*, Random House, 2001.

Lessig argues that Court decisions are pushing us toward a more regulated and less spontaneous order with respect to the Internet and other new technologies. A very provocative read.

- Russell Roberts, Liberty Fund

Titles not yet Annotated

Levy, S. *Artificial Life: The Quest for New Creation*, New York: Random House, 1992. (www.hehd.clemson.edu/complex/AnnotBib.htm)

17. ORGANIZATION THEORY and emergent order

* **Hayek, F. A. *Cosmos and Taxis*, chapter 2 of *Rules and Order*, vol. I. *Of Law, Legislation and Liberty*, Chicago: University of Chicago Press, 1973. 35-54.**

Here Hayek discusses in depth the differences between spontaneous orders (Cosmos) and made or constructed orders (Taxis), which include all forms of human organizations with specifiable goals, such as corporations, government bureaucracies, political parties, and the like.

_____. ***The Road to Serfdom*. Chapters 10 and 11. Chicago: University of Chicago Press, 1944. 134-66.**

While written as an attack on collectivism, these two chapters from Hayek's book can also be read as an attack on the dehumanizing dimensions of large instrumental organizations as such. Their titles explain their contents: "Why the Worst Get on Top" and "The End of Truth."

* **Hock, Dee. *Birth of the Chaordic Age*, San Francisco: Berrett-Koehler Pub., 1999. 331 pp.**

Dee Hock is founder and first CEO of VISA International, perhaps the world's largest commercial enterprise. Rather intuitively, Hock utilized the implications of incorporating emergent principles into business to achieve his success. The hostility of some confederates kept him from pushing his ideas as far as he would have liked – but he achieved a lot nonetheless. In addition, Hock discusses the wider philosophical, social, and ethical implications of such an approach, which he terms "chaordic" as a combination of chaos and order.

Hock and others interested in these concepts primarily as they apply to organizations have created an organization, the "Chaordic Commons" with an interesting website: www.chaordic.com.

Sherman, Howard J. and Ron Howard. *Open Boundaries: Creative Business Innovation Through Complexity*. Perseus Publishing, 1999. 232 pp.

Howard Sherman and Ron Schultz apply concepts from the field of complexity thinking (the study of dynamic, adaptive systems) developed in the Santa Fe Center for Emergent Strategies to help readers understand the basic principles, cognitive models, and rules

governing organizational decisions and actions. They argue understanding these principles will encourage greater creativity and more effective problem solving. They offer examples such as Applied Biosystems and the U.S. Marine Corps.

Titles not yet Annotated

Cornuelle, Richard. *De-Managing America: the Final revolution*, Random House. 147 pp.

Hardwick, David F. *Laboratory Supervision and Management*, Vancouver, Canada: Tantalus Publications, 2002.

_____. "Directing" and Managing in a Professional System. *Modern Pathology*, Vol. 11, No. 6. 1998. p. 585.

_____, Hardwick, Walter G. and diZerega, Gus. Directing change: a contemporary administrative challenge. *Modern Pathology* 10,1997. pp. 380-3.

Huber, George P. The Nature and Design of Post-Industrial Organizations, *Management Science*, 30:8, August, 1984. pp. 928-950.

Petzinger, Thomas jr. *The New Pioneers: The Men and Women Who Are Transforming the Workplace and the Marketplace*, New York: Simon and Schuster

Semler, Ricardo. *Maverick: The Success Story Behind the World's Most Unusual Workplace*, Warner Books, 1993.

Wheatley, Margaret J. *Leadership and the New Science: Discovering Order in a Chaotic World*. 2nd ed., San Francisco: Berrett-Koehler, 1999.177 pp.

Wheatley, Margaret J. and Myron Kellner-Rogers. *A Simpler Way*, San Francisco: Berrett-Koehler, 1996.

18. CULTURAL/AESTHETIC STUDIES

Argyros, Alexander J. *A Blessed Rage for Order: Deconstruction, Evolution, and Chaos*. Ann Arbor: University of Michigan Press. 1991. 356 pp.

In a challenge to deconstructivism, Argyros argues that while socio-institutional contexts play a major role in defining the human world, other contexts are also vital. Culture is on an endless innovative continuum with the natural world. Among theorists relevant to this bibliography, Prigogine is particularly important. See particularly Part III: "Chaos." 227-349.

Turner, Frederick. *Beauty: The Value of Values*, Charlottesville: University of Virginia Press, 1991.

A fascinating exploration of possible dimensions of evolution and self-organization largely ignored. Experiencing aesthetic beauty is an adaptive function driving evolution through sexual selection. Turner links aesthetics with brain research, arguing that neurotransmitters in the brain respond to inherited systems through which beauty is perceived.

Titles Not Yet Annotated

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19. CRITICISMS OF THE CONCEPT

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Hayek's spontaneous order is a myth implying no external causes, or at least no need to study them.

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Bromley, David W. Searching for Sustainability: The Poverty of Spontaneous Order, *Ecological Economics*, 24:2-3. 231-240.

Judging from the title, this is a critique. I haven't read it yet.

Charny, D. Illusions of Spontaneous Order: “Norms” in Contractual Relationships, *University of Pennsylvania Law Review*, 144:5. 1841-1858.

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Judging from the title, this is a critique. I haven't read it yet.