Review Essay

QUO VADIS, SYSTEMS THOUGHT?

by James E. Huchingson

Abstract. Progress in general systems theory has been slow. Three recent books in the field reflect both the hopes and continuing frustrations of systems advocates. Frustrations include the widespread perception that systems theory is a kind of gnostic redemption, an abstract program to be administered by an elite cadre of experts for the sake of integrating knowledge and reorganizing society. This mechanistic understanding generates a resistance which could be countered by a more open and organic model of human systems. The ambiguity of systems thought lies ironically in its ability to embrace both of these images within its conceptual scheme.

General systems theory is not exactly a household name, but neither is it completely unfamiliar to many of us who have had minimal exposure to its perspectives and effects. Perhaps we know that systems theory symbolizes both a grand vision of nature and human society or that it provides the conceptual foundation for the tremendous reshaping of our culture and economy by swift strides in electronic communications and management technology. Unfortunately, such popular images often represent the total knowledge of the public about the systems approach and its consequences. Despite the fact that the Society for General Systems Research was founded in 1954 by a group of its most influential proponents in a common spirit of optimism and hope, the situation has apparently changed precious little in the ensuing thirty years. The number of undergraduate and graduate programs in the field of systems studies on the North American continent can be counted on the fingers of one hand. Biology, the one discipline in which the conceptual framework of systems should show impressive influence, remains under the dominance of analytical or reductionistic

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[*Zygon*, vol. 20, no. 4 (December 1985).]
 ISSN 0044-5614

approaches. These methodologies, aggressively applied, continue to produce important new discoveries in genetic and molecular biology, thereby reinforcing the popular claim that life is merely chemistry. The evidence is ambiguous, and the questions persist. Is general systems theory inconspicuously present in industry, education, and even the humanities, growing like the proverbial mustard seed and generating a great network of holistic interaction? Or is it an idea whose time may never quite come, destined to be a fascinating but frustrated secondary movement in the intellectual history of the twentieth century?

Three recent books offer the opportunity to sound out the current state of the field in systems studies. Two of these, Mark Davidson's *Uncommon Sense* (1983) and Ervin Laszlo's *Systems Science and World Order* (1983), speak explicitly and most affirmatively about the character and power of the systems paradigm, while Wayne Kraft's *A Reason to Hope: A Synthesis of Teilhard de Chardin's Vision and Systems Thinking* (1983) sets out with a different purpose and represents the application of the systems approach to theology. Together, these books suggest reasons for the apparent perplexing state of affairs in systems studies.

Ludwig von Bertalanffy as Gnostic Hero

Uncommon Sense celebrates the life, thought, and contributions of Ludwig von Bertalanffy, the acknowledged father of general systems theory. Davidson is a science journalist who put his investigative talents to work in utilizing many private materials from Bertalanffy's personal files which were made available by his widow, Maria. Bertalanffy was an Austrian theoretical biologist, who came to America following World War II. Until his death in 1971, he published widely on his holistic theories about life and society which brought him into sharp conflict with the dominant analytical and reductionist mentality of the life sciences. Davidson's style is refreshingly lucid and even his efforts to explain the basic ideas of Bertalanffy's thought, including open systems, equifinality, steady state, hierarchy, and complexity, are successful because of the nontechnical fashion in which they are presented. The book is intended for nonspecialists. It represents one of the few attempts available to demystify the ofttimes technical and highly abstract vocabulary of systems theory.

The author describes systems thought as a way of seeing the forest for the trees, of emphasizing integrated wholes over isolated parts. It is, in short, "an uncommon sense of interactive relationship within and between wholes" (Davidson 1983, 22). A system, whether natural or social, is both structural and dynamic. It is a set of elements in interaction, a whole rather than a heap, and it exchanges material, energy, and information with its environment by way of adjusting and contributing

to that environment. Open systems engage other systems and mutually couple with them to create yet greater and more inclusive systems. A system, therefore, contains other systems, its subsystems and components, and is contained in another system, its supersystem and environment, in a hierarchical organization or pyramid of emergent complexity. Indeed, the directive term is "organization." Systems thinkers ask not, "What is it made of?" but "How is it organized?" And between the two questions there lies a world view of difference.

Davidson divides his attention between an account of systems concepts and an effort to relate these concepts to humanistic interests. The image of the human being as a radically open system facilitates discussion of the relationship between the unique dimension of human concerns and meaning—including freedom, values, morals, and religion—and the natural order. This potential of systems thought for bridging the "two cultures" through a holistic paradigm is very exciting. Davidson correctly recognizes this dimension of Bertalanffy's thought and gives it due emphasis. *Uncommon Sense* makes good sense.

The book's subtitle, *The Life and Thought of Ludwig von Bertalanffy*, is accurate but misleading. The reader soon discovers that the biographical sections are sketchy and anecdotal. Primary consideration is given to those events in the professional life of Bertalanffy wherein he develops a new concept, comes to criticize a prevailing and opposing ideology, or renders a major contribution to society. This treatment and emphasis are no surprise. With few exceptions—only Paul Tillich and Bertrand Russell come quickly to mind—few modern scholarly figures led lives which were so unusually rich in interesting diversions that their bibliographies attracted large audiences.

Davidson's other reasons for including biographical material soon emerge. The characterization of Bertalanffy is that of the classic and somewhat isolated intellectual, who, by the sheer power of his brilliance, creates a theoretical system of great novelty and potential for the betterment of humankind. He advocates these ideas unflinchingly in the face of considerable opposition from the scientific establishment. He identifies and battles the dehumanizing tendencies of mechanistic approaches to understanding human nature while arguing persuasively for his own systems-holistic model of the species. Time and again the author takes the opportunity to include tributes from notable, credentialed witnesses in numerous and diverse fields of inquiry who laud Bertalanffy for his singular contribution to their own thinking. The mythological figure most obviously suggested by this account is the gnostic hero, who delivers the *gnosis* or saving wisdom to a community wandering in ignorance and uncertainty. His thesis is clear: the time has come to recognize Bertalanffy as a figure whose legacy of ideas contains tremendous therapeutic value for civilization.

Davidson's characterization is not caricature. Bertalanffy is clearly a person of brilliance, originality, and continuing influence. Nonetheless, this treatment of his career suggests a revealing response to our original questions of the whence and wherefore of general systems theory. *Uncommon Sense* documents the processes through which the scientific and phenomenological theory of systems is subtly transmuted into a philosophical perspective possessing many of the features of an ideology. These include the authority of an originating genius; antagonistic response from an established opposition ideology; continued attempts to sway society away from this opposition by listing its damages attending to its dangers and by promoting the curative powers of the new and radical alternative; and a prescription or set of normative, social objectives which, if implemented, would bring about this healing. On the basis of Davidson's portrayal one might conclude that the current predicament of general systems theory is partially the result of its more passionate advocates to market their claims in just this manner.

Conditions Which Frustrate Systems Theorists

Laszlo is a philosopher of science and is presently a Senior Fellow of the United Nations Project on the Future. He has more than twenty books to his credit as author and editor. Most of these have to do with the theoretical and practical aspects of general systems theory. He is the current editor of the journal *World Futures*.

Systems Science and World Order reflects Laszlo's binocular interests. The first half of the book is devoted to articles on systems science and philosophy while the second half is concerned with global strategies and issues. All of the essays were written between 1970 and 1983. Unlike *Uncommon Sense*, Laszlo's work is intended for an academic and professional audience. This fact should not deter the lay reader, for, while much is demanded of him, much is given by the author. Laszlo clarifies and defends the fundamental notions of systems thought by employing the various and diverse tools of philosophical argumentation ranging from the more traditional ideas of general metaphysics and epistemology to language analysis and symbolic logic.

Laszlo hopes to explain rationally and justify rhetorically the inherent worth and usefulness of systems thought to a wide audience which, although not hostile to holism, is more likely to be committed to the virtues of specialization and analysis. The wide range of areas he addresses is evidence itself for the claim that general systems theory is a discipline of disciplines, an approach which is capable of unsealing and unifying many closed chambers of specialized thought and language under a common perspective.

In addition to this missionary intention, *Systems Science and World Order* also undertakes a candid examination of the prevailing conditions which block and frustrate progress. One of these is an indifference to and fear of significant innovation by those who are comfortably situated within isolated islands of specialized knowledge where they feel secure, confident, and powerful. A second is the widespread belief that general systems theory is an exceedingly vacuous set of nearly useless principles about ultimately abstract entities called general systems. Laszlo explains with patience and in considerable detail that general systems theory is not a "theory of general systems," but rather a "general theory of systems" (Laszlo 1983, 12). Two and one-half pages of argument are required to dispel this one instance of semantic confusion. It constitutes a point perhaps *too* well made, but one which is nonetheless indicative of the extra mile traveled by systems proponents in their efforts to fight widespread biases regarding the approach.

A third and more significant factor blocking the progressive dissemination of systems principles is institutional. Laszlo observes that "monies and prestige are vested in academic departments and the departmental structure of colleges and universities is almost exclusively disciplinary" (Laszlo 1983, 9). There is little tolerance of innovative programs which are truly integrative or interdisciplinary. Hence, "field" programs such as environmental studies (sometimes called the subversive science) must make it on their own in the face of considerable skepticism in a time when department chairs are calling for yet more subject concentration in terms of credit hours required of student majors.

Ironically, an additional frustration lies in the novelty of systems theory as a "field-encompassing field." While vigorously pursuing their ultimate goal of the unification of the sciences under the aegis of a relatively few integrative principles applying across a wide range of empirical phenomena, systems theorists have introduced their own highly specialized language, preferred problems, and standards of privileged professional access. To become competent in the field, a student should concentrate his studies there. But a department created to satisfy this requirement becomes yet one more program in its resemblance to any or all of the other specialized disciplines represented by traditional departmental structures.[1] Since few programs in systems studies exist, this situation is rare. Hence, the unusual burden of mastering *two* fields is placed upon students of systems thought. They must develop competence in both a traditional scientific or humanistic discipline and the intricate, sometimes esoteric, language and method of systems theory itself. Practicing systems theorists are most often

found on the departmental rosters of more orthodox disciplines. They assemble occasionally at conventions of the Society for General Systems Research there to form a mix of disciplinary representation as rich as the intergalactic barroom scene from the movie *Star Wars*. It may well be that a new synthesis of human knowledge will emerge from the heroic dedication of such individuals. But Laszlo's discussion of these and other factors blocking progress chastens even the zealous optimist.

The Spector of an Elitist Management of Society

Perhaps the prospects for general systems theory fare better when industry and technology are appraised. Space-age technology has literally taken up residence in the American home in the form of the personal computer. Amazing advances occur almost daily across a wide front in electronics, biomedical technology, and aerospace systems. Could one not confidently predict that the powerful application of systems analysis, information theory, cybernetics, computer simulations, even queuing and catastrophe theories, may yet win the day for the systems approach?

According to Davidson, Bertalanffy did not think so. It was precisely this very power contained in the social and industrial application of systems principles which he feared. Through the efforts of a systems technocracy, he felt that the human element might be suppressed because it represented the unreliable part of a utopian megamachine which required uniform behavior of its components. This darker side of applied systems thought places it in alliance with mechanism and in opposition with the softer open systems approach which Bertalanffy preferred. After all, machines are systems, too. They may be classified at the far end of a spectrum ranging from mostly closed, isolated, preprogrammed systems to radically open, communicative, self-adjusting systems. It was Bertalanffy's opinion that the proper and true image of humanity as a symbolic and valuing animal probably resides very near the extreme of the open system end of the spectrum. The majority of systems technocrats apparently believe otherwise and base their social objectives on a much narrower mechanistic appraisal of human nature.

While Laszlo concurs with Bertalanffy's concern, he seems to be more optimistic than his intellectual mentor about the appropriate use, not abuse, of systems principles in societal application. The essential purpose of the human species, he maintains, is the effective "self-regulation of human life and civilization in accordance with the objective requirements of its existence" (Laszlo 1983, 159). Systems analyses of the global situation, which include such efforts as those marshaled by the Club of Rome, clearly show that these "objective requirements" are

not being addressed rationally by current international political, social, and economic systems. Laszlo is convinced that a systems approach is the only viable means by which earth's multitudinous and complex problems may be successfully inventoried, addressed, and solved. Still, his approach to the application of systems thought seems to display a strong elitist emphasis. He advocates "a conceptual framework in which policy-makers can become interdisciplinary in basic knowledge and sensitive to the changing world around them. This will be, of necessity, a systems framework" (Laszlo 1983, 215). He goes so far as to envision a five-phased, life-long educational experience by which world leaders and high-level administrators would be trained to perceive the globe as a complex and integrated whole, and, consequently, to make long-term decisions based on the requirements of this vision (Laszlo 1983, 216-17).

One may argue that systems management techniques, as legislated by well-meaning experts who possess the requisite political, economic, and social power, constitute the only workable strategy to rescue a world experiencing *grand mal* seizures from famine, terrorism, assassination, continuous clandestine war, nuclear weapons, economic instability, and growing resource scarcity. However, such technocratic elitism runs counter to the present populist mood and its traditional suspicion of irrelevant bureaucracy and the centralization of power. Unfortunately, the term *system* frequently evokes Orwellian images of rigorous social control and the standardization of human beings. Such fears are often amplified by other elitists, primarily commentators on culture and society, who probably ought to know better. This perceived association of systems theory and social control simply adds to the problems of communication that nag and vex advocates of the holistic paradigm.

Systems Apologetics: The Cybernetic God

The approach and intention of *A Reason for Hope: A Synthesis of Teilhard de Chardin's Vision and System Thinking*, the third book here under review, vary significantly from the synoptic perspective of Davidson and Laszlo. The author, R. Wayne Kraft,[2] is motivated primarily by an evangelical impulse to construct a total picture of traditional Christian verities, including God, Christ, and the Trinity, in terms of a conceptual framework of systems. Kraft's efforts are a legitimate exercise in Christian apologetics, but expressions of his zeal are neither subtle nor rare. He frequently interrupts his argument with short homiletical diversions or enthusiastic testimony: "I love God. . . . By making him known as I know him, I hope that others will come to love and serve him, too" (Kraft 1983, 140). While occasional eruptions of praise and confession are understandable, authors of books like this one would be

better counseled to remain modestly in the background and leave the task of persuasion to the inherent logic of their arguments.

Another peculiar trait of the book is its choice of a systems model through which theological notions are to be elucidated and clarified. The organismic systems approach, based upon induction, preferred by Bertalanffy and refined by Laszlo, is neglected in favor of a more rigorous and mechanistic perspective which is applied literally to the theological material.[3] Kraft draws heavily from cybernetics, communications and information theory, and classical thermodynamics to assemble what amounts to an *imago mundi* for deity. His orientation would seem to appeal primarily to both the technological and theological positivist, to the mechanical and communications engineer or the industrial scientist. Theologians and others trained in the humanities may have some difficulty with the author's easy associations between doctrines of faith and concepts in the applied systems sciences.

Kraft's knowledge of his theological hero, Pierre Teilhard de Chardin, is impressive, and his discussion of the Jesuit paleontologist is accurate and informative. Yet he fails to integrate Teilhard's vision successfully into his own model. The reason is obvious: Teilhard's style, his poetic and mystical inclinations, his exasperating neologisms, simply cannot be easily adjusted to a literal-minded approach. For all his considerable ingenuity, Kraft fails to appreciate the multivalent, symbolic, and mythological functions of theological language and conceptual model-building, and it shows.

Is Systems Theory too Comprehensive for its Own Good?

The most notable proponents of the systems theory are men of vision and enthusiasm. And well they should be, for the systems approach offers a perspective of great comprehensiveness and scope. It recommends itself as a source of hope for reknitting the shredded vision of a culture which is living out in its history the basic contradictions inherent in a dysfunctioning world view.

With the promises of systems thinking come pitfalls as well. Two of these are paramount and highly visible to the eyes of its critics. The first is the observation that systems thought is excessively theoretical, all-encompassing, vague in the extreme. This self-elevation into Himalayan abstraction is what renders it innocuous. Critics suspect that systems theory, in attempting to be about everything, turns out to be about nothing, or at least about no particular thing. Granted, systems theory demonstrates loft, but to many it lacks heft. Furthermore, the intellectual temper of the time continues to tend toward pluralism. Reality comes in many forms and these seem to lend themselves well to

varying modes of inquiry which suit the particular demands of the class of objects under scrutiny. The special sciences are simply effective ways of dealing with the great diversity of things in the world in their own terms. The need for some abstractive consolidation of these accounts is not yet judged widely to be an urgent task.

The second pitfall, ironically, discloses a fearful heft. Potential for abuse of the applied systems approach in projects of global social engineering and planning implemented by technocratic elites raises nightmarish prospects of loss of freedom and rights in favor of regimentation and standardization. The literature of systems thought is replete with repudiations of this objective. Despite these disclaimers, however, systems thought continues to be viewed with considerable suspicion as an aspiring ideology on its way to dominance (cf. Lilienfeld 1978).

In all probability, systems studies will continue to denominate into two branches, each governed by a distinctive root metaphor. The first branch depends upon the classic metaphor of the machine, refined to include contemporary advances, of course. The second is that of the organism as it is understood in Bertalanffian categories. Systems theorists frequently deemphasize metaphorical similarities and promote instead the structural and dynamic similarities of natural systems. This doctrine of isomorphism permits the systems paradigm to embrace both the machine and the organism in an impressive demonstration of its comprehensiveness. But in turn, this olympian reach lends a certain ambiguity to the theory and aggravates the continuing frustration of those who argue on its behalf.

While there is no release of this tension between two prevailing images, systems thinkers can take courage from authors such as Davidson, Laszlo, and, in his best moments, Kraft, who attempt to educate their various audiences about the field. Hopefully, such efforts will reduce resistance and encourage enthusiasm. At the very least, they sustain the positive visibility of systems thought as a resource for an age whose range of options may be narrower than we realize.

NOTES

1. This point was first made, to my knowledge, by Margaret Mead in a speech before a meeting of the Society for General Systems Research at the State University of New York at Geneseo in 1973.

2. The author's identity and credentials are nowhere revealed in his book! We do know, however, what he looks like since a full-page photographic portrait precedes the acknowledgments. Further internal evidence reveals that he has written at least one other book on Teilhard and that he is associated with Lehigh University, his "professional 'home'."

3. Neither Bertalanffy nor Laszlo appears in the book's index. Laszlo's *The Systems View of the World* is included in the bibliography.

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