Overview of Systems Philosophy

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This section is part of a chapter which includes:

- Overview of Systems Philosophy
- Section on Natural Systems
- Overview of Bowen Theory

The purpose of this chapter is to position Bowen theory in relation to mainstream research and applied psychology. An important aspect of describing this position is to distinguish the unique paradigmatic position of the theory, which to the greatest extent is called here *natural systems philosophy.* Without such a distinction, it is easy to confuse the subtle meanings of biological terms used in Bowen theory such as *basic-self*, *emotion*, *differentiation, fusion,* etc. with general systems or non-systems concepts, and lose sight of the broad reach of Bowen's contribution to the natural sciences.

Like the prominent systems philosophers described earlier, Bowen valued developing an integrative framework which organizes information from many levels and believed this would only be possible with a move to systems thinking. He worked in the context of a grand integrative natural system theory which would "bind the millions of disparate facts of the physical universe into one, overarching system" (Wylie, 1991). However, it is probably not accurate to say that Bowen conducted his research within the systems paradigm as it is understood by prominent systems philosophers. We will position Bowen's work in relation to popular systems philosophers by first examining popular notions of systems philosophy, followed by a look at what set Bowen apart in his natural systems view.

First, we will review the philosophical foundation of the systems paradigm in general and what sets it apart from mainstream science. Then we work our way from the most general application of systems philosophy in Bertalanffy's General System Theory (GST), Lorenz's discovery of chaos and the study of complexity, and end with the concept of natural systems and Bowen's natural system theory of the human family. The purpose is not to give a comprehensive overview of the range of system approaches, but to distinguish Bowen's system theory from other system approaches and pave the way for a paradigmatic comparison of the Buddha's work with the concept of a natural system.

Systems Philosophy

Modern systems philosophy first arose as a critique of the limits of reductionism for problems of complexity and a call for organizational unity in the sciences. These problems are described in the preceding chapter on complexity and compartmentalization in science. A common aim of the early systems thinkers, including Bowen, was the development of an overarching multidisciplinary framework that could organize and coordinate knowledge from the vast array of the analytical disciplines. This required a radical augmentation of the existing philosophy of science. As with Wilson (1999), many of these philosopher-researchers were interested in answering the most difficult human problems like overpopulation, ecological crisis, and war, by integrating research from many domains (Bertalanffy, 1968/2015).

While the modern paradigm of systems philosophy can be credited to integral theorist Ervin Laszlo (1973), the origin of systems thinking in the West might be traced back to Thales and Democritus of Ionia and eventually Aristotle, who wrote his *Metaphysics* to reconcile the rationality of Plato's Theory of Forms with common observations in nature (Aristotle, 2004). Late 19th and early 20th century Russian physician and philosopher Alexander Bodganov (1912-1917/2003) wrote of unifying the sciences through *Tektology* as a discipline of relationships and processes instead of an elementistic view of static things. Bodganov saw the natural world as one of organization, where forces either composed or decomposed material aggregates according to their nature. Bodganov (1912-1917/2003) writes of pervasive organization, even in apparent "deorganization,"

> And yet we are left with destructive activity. On direct and isolated consideration this function is *de-organizing*. However, a deeper analysis shows that even this form is an outcome of competition between different *organizing* processes. When a man kills and eats an animal, he deorganizes some living system to organize its elements according to his physical constitution. (p. 2)

This view contributed to systems thinking through a focus on the processes of nature as opposed to merely studying the elements and constituents of nature.

Though the unification of knowledge was the philosophical goal, there are many different approaches to systems thinking today. That is, systems thinking as a discipline is still in development. Of these, the work of Ludwig von Bertalanffy (1968/2015) was a seminal philosophical starting point for the special theorists to follow. A biologist, Bertalanffy laid the framework for what science might look like united under the banner of systems philosophy. He provided key concepts such as *open* and *closed system* which define much of the vernacular adopted by systems theorists, including Bowen (Papero, 1990). Bertalanffy's open-system theory eventually became the basis of what is known today as GST, which is a philosophical loom through which to weave the fabric of an integrative theory of all of nature. Bertalanffy adopted the organismic perspective in his theory of open systems such as living beings, which are less predictable and more adaptive than closed systems such as machines or classic physics experiments.

Together with Bertalanffy, Hungarian philosopher and integral theorist Ervin Laszlo defined the systems paradigm in *Introduction to Systems Philosophy: Toward a New Paradigm of Contemporary Thought* (1973) as a philosophy of science, calling it "Systems Philosophy." This work is probably the most general of the systems literature, outlining the most fundamental purpose of the specialized theories which are to follow. In a previous article *Systems Philosophy,* Laszlo *(1971/2003)* critiques an over-focus on reductionistic thinking in science and called for scientific generalists to synthesize the analytic data of reductionistic science. He argues that reductionism has provided for the feats of engineering of the industrial revolution but has left the cognate disciplines a scattered and uncoordinated array of increasing specialization, that "the fields of knowledge are worked in patches, each man concerned with no more than his own territory, 'cultivating his own garden'" (1971/2003, p. 111). The lack of generalists in science has restricted increasing knowledge from increasing meaning in human life, creating an "existential vacuum" in the West which has contributed to the rising interest in Eastern synthetic thought. Laszlo (1971/2003) writes,

> Bookstores are crammed with Eastern sacred texts, studies of astrology, reincarnation, states of consciousness, and the like. Students from across the country are demanding courses in Buddhism, Hinduism, and Mysticism. . . . Psychiatrists, psychologists, and clergymen of all faiths are joining the younger generation in this pursuit. . . . The demand to see things whole. (pp. 12-13)

Laszlo suggests though specialization is as important as generalization, that between "atomism" and "holism" it is holism that marks a "healthy, self-actualizing person," and that "Insistence on the atomistic mode is in itself a form of psychoneurosis" (p. 112).

Laszlo's systems philosophy primarily presumes that the world exists, and "is, at least in some respects, intelligibly ordered" (1971/2003, p. 113). He distinguishes two secondary presuppositions which define the specialist and the generalist; that "the world is intelligibly ordered in special domains; the world is intelligibly ordered as a whole" (p. 114). However, the second presupposition, that of the generalist, is more often assumed to require demonstration while the first, that of the specialist, is taken as fact. He argues that specialists tend to ignore the second presupposition and assume that special observations alone reflect facts of nature, that results in special domains are easily validated but results in general domains can also be validated through corroborating evidence across multiple special domains. The second presupposition points to Wilson's (1999) argument that *consilience*, findings from disparate domains supporting one another, is one of the most important criteria of science.

One prospect of systems thinking is that it can organize solutions to problems of great complexity where reductionism cannot. Systems philosophy is in large part an effort to move beyond the psychological splits indicated by linear thinking and into a paradigm which assumes that polarities are a product of the observer and not of nature. However, a common misconception of systems philosophy is that it is equivalent to *holism*, which itself is only one side of the split between holism and *atomism* (Bunge, 1977). An atomistic, or reductionistic view of the human would break us down to cells, atoms, electrons, protons & neutrons, quarks, etc. A pure holistic, or gestalt, view might focus on overall experience using aggregate, irreducible terms like person, human being, or feeling terms like anger, happiness, and will. Bunge (1977) addresses this problem by defining the relationship between analysis and synthesis in the systems paradigm. He divides systems thinkers into two camps,

> Those who wish to extend the range of application of the scientific approach to all cognitive problems dealing with systems, whether natural, social, or artificial, and those who hope General systems will give them instant wisdom and spare them the trouble of learning some mathematics and some science. Where as the former see in [general systems theory] an extension of ordinary science and an exciting new venture of the analytic mind, the latter see in [general systems theory] a retreat from reason and a return to semi mystical speculation. (p. 103)

Bunge argues that synthetic holism ignores the analytic rigor of atomism, defining the goals of analysis as “the same as those of science, namely the explanation, prediction, and control of whatever can be explained, forecast, and controlled” (p. 104). The method of atomism is reason and the method of holism is intuition. Emergent properties “cannot be explained by analysis and must be accepted with reverence” (p. 104). Bunge goes on to assure us that systems thinking “does not hold that such novelties are unexplainable, and so must be accepted by an act of faith. If it did, [general systems theory] would be incapable of suggesting theories aiming at explaining precisely such emergent properties and patterns” (p. 104). Therefore, Bunge suggests that the systems approach goes beyond atomism and holism through the explanation of emergent properties of the whole in terms of the interactions of the parts. Perhaps most importantly, Bunge writes that “the [general systems] approach lies midway between the scientific and the philosophical approaches” (p. 104).

This highly integrated blending of general and specific domains can be seen in the simultaneous interest of systems researcher-philosophers such as Bertalanffy, Bowen, and Wilson in areas of special research, as well as where that special research fits into the global integrative scheme. The challenge inherent of this kind of philosophical and practical integration, including the integration of rational and intuitive methods, may in some part explain the relatively small proportion of systems researchers today in comparison with the vast majority of special researchers and associated funding for specialized research. This imbalance could both explain and support Laszlo’s call for scientific generalists.

Thus, the ultimate aim of the best-known systems philosophers is to study isomorphic properties of organizational units and processes in nature. Systems thinking looks beyond simple “cause and effect” relationships and into a broader, mutual-causal context of complex problems (Macy, 1991). This type of ecological thinking naturally looks beyond solving specific issues and into understanding how many issues may relate to each other in order to effect change on a broader level. Laszlo (1971/2003) writes of the emergence of special theories under the banner of systems philosophy,

> Their common denominator is the systems concept *par excellence* of general theory; their advantage over other concepts is that they are capable of remaining invariant where others encounter limits of applicability. That is, the range of their transformations (more exactly, the number of operations in regard to which they are invariant) is greater. Hence, they can exhibit general order where the classical concepts show only delimited special orders. (pp. 115-116)

O. Wilson echoes Laszlo’s call for generalists in *Consilience (1999)*, where he suggests consilience, or “explanations of different phenomena. . . that can be connected and proved consistent with one another” (Wilson, 1999, p. kpp 82), as a particularly strong and important criterion for scientific validity. Writing with spiritual inspiration of his passionate shift from organized religion to the natural sciences, Wilson suggests that the early Enlightenment thinkers like Condorcet & Bacon “got it mostly right the first time” (p. kpp 20), and that the early scientific ideal as worthy of revival now more than ever. Perhaps reflecting his own desire to replace his search for wholeness in the Bible with a search for unity in science, Wilson holds tight to science as an inductive process with a necessary step for synthesis in the spirit of Laszlo. He cites William Whewell (1840) as the first to mention consilience in *The Philosophy of the Inductive Sciences* as,

> literally a ‘jumping together' of knowledge by the linking of facts and fact-based theory across disciplines to create a common groundwork of explanation. He said, “The Consilience of Inductions takes place when an Induction, obtained from one class of facts, coincides with an Induction, obtained from another different class. This Consilience is a test of the truth of the Theory in which it occurs.” (p. xxxix)

For Wilson, the criterion of consilience, supportive relationships among independent findings from disparate natural domains, is the wholeness-variable of the scientific world view.

Consilient findings support Laszlo’s secondary presupposition that “the world is intelligently ordered as a whole” (1971/2003, p. 144), that science has the potential to provide some level of meaning beyond that of reducible material elements. Wilson also urges that this synthesis does not provide something extra on top of what science already is, but that it is an integral part of science that is often left out. “The ongoing fragmentation of knowledge and resulting chaos in philosophy are not reflections of the real world but artifacts of scholarship” (p. kpp 20). He urges that consilience will face its “surest test” “in the social sciences and humanities” (p. kpp 21) as the meaning-maker of the sciences. He gives an example of the problem of global deforestation, which is effected by knowledge and assumptions in the domains of environmental policy, ethics, biology, and the social sciences,

> We already intuitively think of these four domains as closely connected, so that rational inquiry in one informs reasoning in the other three. Yet undeniably each stands apart in the contemporary academic mind. Each has its own practitioners, language, modes of analysis, and standards of validation. The result is confusion, and confusion was correctly identified by Francis Bacon four centuries ago as the most fatal of errors, which "occurs wherever argument or inference passes from one world of experience to another." (p. kpp 22)

Wilson may echo Bertalanffy's (1968/2015) observation of a growing recognition of the interconnectedness of problems in the 1960's,

> Politicians frequently ask for application of the "systems approach" to pressing problems such as air and water pollution, traffic congestion, urban blight, juvenile delinquency and organized crime, city planning (Wolfe, 1967), etc., designating this a "revolutionary new concept" (Carter, 1966; Boffey, 1967). A Canadian Premier (Manning, 1967) writes,
>
> > the systems approach into his political platform saying that an interrelationship exists between all elements and constituents of society. The essential factors in public problems, issues, policies, and programs must always be considered and evaluated as interdependent components of a total system. (p. kpp 31)

In short, Wilson urges a change in the priority of synthetic knowledge. One way to enforce this priority would be a basic change in education. He writes, "Every college student should be able to answer the following question: What is the relation between science and the humanities, and how is it important for human welfare?" (p. kpp 26). He goes on to promote this synthetic view at all levels of society,

> Every public intellectual and political leader should be able to answer that question as well. Already half the legislation coming before the United States Congress contains important scientific and technological components. Most of the issues that vex humanity daily—ethnic conflict, arms escalation, overpopulation, abortion, environment, endemic poverty, to cite several most persistently before us—cannot be solved without integrating knowledge from the natural sciences with that of the social sciences and humanities. Only fluency across the boundaries will provide a clear view of the world as it really is, not as seen through the lens of ideologies and religious dogmas or commanded by myopic response to immediate need. Yet the vast majority of our political leaders are trained exclusively in the social

> sciences and humanities, and have little or no knowledge of the natural sciences. The same is true of the public intellectuals, the columnists, the media interrogators, and thinktank gurus. The best of their analyses are careful and responsible, and sometimes correct, but the substantive base of their wisdom is fragmented and lopsided (pp. kpp 26-27).

Laszlo's critique was seminal for the paradigm, and most clearly defines the philosophical trend that was already underway immediately following World War II without depending on definitions from special domains. Beginning with Alan Turing's statistical analysis of German tactics during the War, scientists and engineers of the time were beginning to approach problems of complexity (mentioned in the Chapter 2 section *The Problem of Complexity in Science* in this document) from an increasingly multidisciplinary perspective (Good, 1979; Mardia & Cooper, 2012). Many fields began using systems concepts to solve particularly illusive problems, from weather prediction, to missile guidance systems, to the role of the family in the behavior of the individual. These domains began creating specialized *system theories* reflected most purely in the philosophical groundwork laid by Laszlo and Bertalanffy.

However, researchers who retained an interest in an integrative theory did so in different ways. The majority, including Bertalanffy (1968/2015), Wiener (1961), and Midgley (2007), preferred beginning with existing conceptual models from various intellectual domains, such as mathematics or mechanical control systems, gathered under the banner of Bertalanffy's general systems theory. Others, such as Bowen (1988), chose to study specific systems as they occur in nature with the hopes of gradually combining them into an integrative *natural systems theory* by combining research from many domains, such as neuroscience (Bassett & Gazzaniga, 2011) and collective behavior (Berdhal, Torney, Ioannau, Faria, & Couzin, 2013). Thus, the many approaches to systems thinking led to different meanings for the term *system* which contribute to equally different approaches to solving problems.

General Systems Theory

Of the special theorists, Bertalanffy probably remained the most evenly divided between systems philosophy in general and a system theory. In *General Systems Theory: Foundations, Developments, Applications (1968/2015),* Bertalanffy's writing straddles the philosophical while touching on specific domains such as the biological organism, social systems, and the human mind. He was interested perhaps most of all in unification. He traces his general systems concept to the "natural philosophy" of Leibniz, the "coincidence of opposites" of Nicholas of Cusa, Köhler's "physical *gestalten,*" and Lotka's formulations of "population problems" *(p. kpp 38)*. But Bertalanffy as biologist was looking for a single theory of everything defined by mathematical laws. He was interested in what living organisms shared with non-living aggregates and began with his concept of an open system. An open system seemingly contradicts the second law of thermodynamics which states that all energy tends to entropy, to disorder, to decay. But living systems seem to organize energy to their service, they repair themselves, they order their environment. A closed system such as a combustion engine, will tend toward decay as in the second law of thermodynamics, where an open system will tend toward homeostasis and even greater complexity over time by way of reorganizing free energy from outside the system. Reproducing, self-repairing systems are open systems. Open systems have the property of *equifinality*, meaning they can reach a similar result in many ways. Equifinality is demonstrated in the move toward homeostasis from many organismic states. If a person is stimulated or depressed, they possess a tendency back to baseline. Closed systems are mechanistic and can (generally) only reach a result in one way *(p. kpp 38)*.

Bertalanffy was interested in creating a unified theory of the sciences, which he called the general systems theory (GST). GST assumed isomorphic relationships between different levels of organization, for example in the boundaries, transfer of information, homeostatic and self-organizing tendency of a human cell or social group. This framework would provide a common language for multiple scientific disciplines to share and compare results and to learn from what their individual units of study might have in common. It would account for problems of complexity and provide a way of combining data from many levels of analysis into a coherent whole *(Bertalanffy, 1968/2015)*.

Bertalanffy argued that the need for such a theory arose from researchers encountering similar problems in differing domains. “The structural similarity of such models and their isomorphism in different fields became apparent; and just those problems of order, organization, wholeness, teleology, etc., appeared central which were programmatically excluded in mechanistic science. This, then, was the idea of ‘general system theory’” (Bertalanffy, 1968/2015, p. kpp 40). Bertalanffy writes of the original function for the Society of for General Systems Research, namely to:

> (1) investigate the isomorphy of concepts, laws, and models in various fields, and to help in useful transfers from one field to another; (2) encourage the development of adequate theoretical models in the fields which lack them; (3) minimize the duplication of theoretical effort in different fields; (4) promote the unity of science through improving communication among specialists. (p. 42)

Bertalanffy (1968/2015) quotes L. Frank’s introduction from a cybernetics conference:

> The concepts of purposive behavior and teleology have long been associated with a mysterious, self-perfecting or goal-seeking capacity or final cause, usually of superhuman or super-natural origin. To move forward to the study of events, scientific thinking had to reject these beliefs in purpose and these concepts of teleological operations for a strictly mechanistic and deterministic view of nature. This mechanistic conception became firmly established with the demonstration that the universe was based on the operation of anonymous particles moving at random, in a disorderly fashion, giving rise, by their

> multiplicity, to order and regularity of a statistical nature, as in classical physics and gas laws. The unchallenged success of these concepts and methods in physics and astronomy, and later in chemistry, gave biology and physiology their major orientation. This approach to problems of organisms was reinforced by the analytical preoccupation of the Western European culture and languages. The basic assumptions of our traditions and the persistent implications of the language we use almost compel us to approach everything we study as composed of separate, discrete parts or factors which we must try to isolate and identify as potent causes. Hence, we derive our preoccupation with the study of the relation of two variables. We are witnessing today a search for new approaches, for new and more comprehensive concepts and for methods capable of dealing with the large wholes of organisms and personalities. The concept of teleological mechanisms, however it may be expressed in different terms, may be viewed as an attempt to escape from these older mechanistic formulations that now appear inadequate, and to provide new and more fruitful conceptions and more effective methodologies for studying self-regulating processes, self-orientating systems and organisms, and selfdirecting personalities. Thus, the terms feedback, servomechanisms, circular systems, and circular processes may be viewed as different but equivalent expressions of much the same basic conception. (Frank et al., 1948, condensed). (p. kpp 43)

General systems look at an objective view of living systems but was not interested in equating them to mechanistic systems. He suggested that as open systems, living organisms possessed the property of equifinality which means that there was no one way for an organism to solve a problem (Nichols, 2016). Open systems exchange information and energy with their environment and change their internal structure, or programming over time (Bertalanffy, 1968/2015). Though pointing out the isomorphic properties of living systems, he was also pointing out their inherent unpredictability.

Today Bertalanffy’s general systems vision remains incomplete, no more than compelling philosophical fuel for the direction of science. However, Bertalanffy’s general systems view shares much conceptual overlap with natural systems research, an alternative systems perspective. It can provide a provisional intellectual jig to formulate hypotheses and many of the concepts may be found to be valid. The deductive process beginning with mathematical presuppositions for natural phenomena may yet prove useful at some level, as it certainly promotes the potential unity of the natural sciences. In the next section, we will review the natural systems concept and some examples of natural systems research.

Popular Systems Thinking

One definition of system is a theoretical mechanism employed to assist the human mind to make sense of complexity. A researcher will most conventionally assign generalized labels to various aspects of a problem using system terms, such as open or closed system, subsystem, object, attribute, differentiation, relationship, boundary, and environment (Baecker, 2017; Hall & Fagen, 1956). Cybernetics researcher Baecker (2017) writes, “[Systems] are distinguished by observers, scientific or intellectual, and discussed with other observers. They describe a complexity, established and maintained by a boundary, which selectively separates a unit from and connects it to an environment as seen by an observer” (p. 10). They may apply terms from cybernetics to describe the regulatory processes of a system, such as negative and positive feedback, *homeostasis*, and first or second order change (Wiener, 1961; Becvar & Becvar, 2018). A system that can reproduce itself with negligible error might be termed *autopoietic*, a property normally associated with living things, including social systems, which have developed this capacity over inconceivably long periods of time (Luhmann, 1986).

For example, a researcher may define a social system as the constituents (objects) of a regional political group, who possess various demographic attributes. The group may be bounded by those who vote in a particular election, are distinguished from other political groups (environment), and defined by the public media and forums (relationships) through which they communicate. The group or an individual in the group may be considered more or less defined (differentiated) as a function of how diverse their reasons for voting a particular way, and how easily swayed they are new opinion, and may maintain its base through the generations (autopoiesis) (Luhmann, 1986). The boundary of the system is problem-oriented and so possesses a subjective quality (Baecker, 2017). The system serves as an *a priori* model designed to organize techniques for change.

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