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PROLOGUE
The Quest for Peace in a Nuclear World

Though hate rises in enfolding flame
At each renewed oppression, soon it dies;
It sinks as quickly as we saw it rise,
While love's small constant light burns still the same.
Know this: though love is weak and hate is strong,
Yet hate is short, and love is very long.

—Kenneth Boulding[1]

These days it seems that Boulding had it wrong; love is so often short-lived and hatred seems deeply entrenched, particularly in the Middle East, where two ancient cultural traditions appear to be bent on mutual destruction. Still, I am hopeful that humanity may someday emerge from this dark chapter in our collective evolution to discover more harmonious ways of living together. We are seeing all around us the bankruptcy and corruption of our current system, a way of life that has placed productivity and profit above human well-being and the sustainability of life on this planet.

My own motivation in undertaking this project grew out of my involvement in the Nuclear Freeze campaign in the early 1980s. I simply could not understand why the United States was continuing to produce such profoundly destructive weapons when we already had more than enough to destroy the world thousands of times over. I sought to understand the assumptions about reality at the root of such seemingly irrational behavior. At the time I heard a lecture by Fritjof Capra, in which he argued that the problems we face as a society (including the arms race, poverty, violence, crime, environmental degradation—and now terrorism) are systemic problems, resulting from a crisis in perception, rooted in the mechanistic model that has dominated scientific thought since the seventeenth century. In contrast to this mechanistic world view, Capra emphasized the importance of a more ecological or systemic conception, based on an understanding of our

fundamental interconnectedness and interdependence, with each other and with all of life.[2]

This perspective on the relationship between the philosophical foundations of mechanistic science and the sociopolitical developments of the postwar era echoed my own growing sense that the greatest obstacles to the goals of peace and disarmament were limitations in the scientific framework underlying Western conceptions of reality and rationality. Returning to graduate school in 1989 to study the history of science, I was interested in understanding how theoretical frameworks in science shape our perception of reality, in turn affecting how we think about society and how we organize our social institutions. Similar concerns are reflected in the work of a number of contemporary writers. Margaret Wheatley, for example, argues that our social institutions are founded on the assumptions of Newtonian physics and the corresponding desire to maintain control, despite current developments in quantum mechanics, chaos theory, and self-organizing systems, which she believes support a more collaborative approach to organization. Mae-Wan Ho suggests that the basic paradigm of science is shifting from the machine metaphor to the metaphor of self-organizing systems, and that such a shift might change how we design our economic institutions. In his latest book, Capra explores the systemic nature of life, mind, and society as a foundation for a more sustainable culture.[3]

Although the rise of mechanistic science in the seventeenth century is often associated with the emergence of political democracies in the West, this dual heritage from the Enlightenment contains an inherent dialectical tension. As critical theorists in the Frankfurt School have argued, the promise of progress through the control of nature ultimately entails the control of human nature, undermining the liberating impulse of democracy and the ideals of social justice that are also part of the Enlightenment tradition. In seeking to address the limitations of mechanistic science, the heroes of my tale are not advocating a return to an earlier or antiscientific view, as much as they are challenging science to transcend its own limitations, to evolve and adapt to the changing conditions of its environment, and to develop a more expanded and inclusive sense of self-consciousness as a critical force in shaping the social order.[4]

The two most noteworthy architects of mechanistic science are René Descartes and Sir Isaac Newton. Descartes described the phenomenal universe as matter in motion, which could be represented in abstract mathematical terms. He also articulated a dualistic relationship between mind and matter, reinforcing Aristotle's distinction between active and passive principles, and the Church's radical separation of spirit and flesh. Newton elaborated fundamental laws of motion regulating the interactions of matter. Uniting the previously incommensurable terrestrial and celestial spheres, his law of gravity ultimately laid the groundwork for a totally materialistic conception of the universe.

As the father of general systems theory, Ludwig von Bertalanffy was outspoken in his criticism of mechanistic science. Like Mae-Won Ho, he proposed a more organismic approach to the study of complex systems, objecting to the narrow reductionism of classical science. Rooted in Descartes's analytic approach, reduc-

tionist science studies natural phenomena by "reducing" them to their smallest components. While a great deal can be learned through such techniques, the scientific enterprise lacks an integrative framework to put the pieces back together again. When the focus is on the parts, and systems at higher levels of organization—individuals, societies, and ecosystems—are understood as essentially determined by these component parts, such concepts as wholeness, autonomy, and integrity become meaningless. From critical analysis to nuclear fission, we have learned well the lessons of taking things apart. Now we must begin to learn the principles of synthesis, how to put the pieces back together and create wholeness—not the rigid totalitarian wholeness that critics of holistic models fear, but a dynamic, co-creative, self-renewing, and self-transcending wholeness—a truly inclusive unity in diversity.

In this context then, I approached systems theory as a possible alternative to mechanistic thinking that might foster the kind of transformation in consciousness humanity needs in order to create a more peaceful and equitable world. As a result, I was puzzled by critiques coming out of the academic community. Depicting systems theory as a kind of technocratic ideology, these critics argued that it was responsible for creating and justifying an increasingly hierarchical social order. For Bertalanffy, however, it was the poverty of reductionism, particularly the "robot model" of humanity in behaviorist psychology, that was responsible for the totalitarianism and militarism of the postwar era. The primary question I sought to address in my research was whether systems approaches are inherently technocratic, reinforcing hierarchical and centralized organizational structures as the critics claimed, or if there might be examples of systemic approaches to the design and organization of social structures that could support a more participatory, inclusive, and truly democratic social order.

Critics tend to equate the concepts of "systems theory" and "systems thinking" with "systems analysis," as developed by the RAND Corporation and other government-funded think tanks during the Cold War years. While some members of the Society for General Systems Research (SGSR) were involved with military and industrial applications of systems models, the dominant current of work within the group reflects a concern with the development of more collaborative approaches to decisionmaking within social systems. The founders of the SGSR shared many of my own concerns and sought alternatives to the growing power of the military-industrial complex and the increasingly dehumanizing tendencies of the emerging technocracy.

Both Kenneth Boulding and Anatol Rapoport were harshly critical of the military-industrial complex and became outspoken opponents of the Vietnam War. They worked together to develop the disciplinary field of peace research and established the Center for Peace Research and Conflict Resolution at the University of Michigan in 1956. In relation to their work in this field, Rapoport was most well known for his work on non–zero-sum models in game theory, and Boulding considered dialogue and participatory decisionmaking as key elements in any conception of peace. As an economist, Boulding was one of the first to incorporate ecological

considerations, and his foundational work in ecological economics was integrally connected with his research on peace and social justice.

Echoing this integrative perspective, Wendell Berry proposes an analysis of the kind of science that has supported such destructive relationships both among humans and between the human community and the natural world: "Apparently everywhere in the 'developed world' human communities and their natural supports are being destroyed . . . by a sort of legalized vandalism known as 'the economy.' The economy now famously depends upon the authority and applicable knowledge of science. It would therefore be useful to say what is the character of this science that has benefitted us in so many ways, and yet cost us so dearly and extracted from us such deferences and such questionable permissions." Such is the question I have attempted to explore in greater depth through the lens of the general systems community.[5]

Further, it is important to consider what might be the nature of such a science that could foster more harmonious relationships. The founders of the SGSR offer some provocative suggestions along these lines. An appreciation of the interconnections between the various dimensions of our lives (social, political, economic, psychological, biological, and technological) and between corresponding disciplinary perspectives is a critical first step. Berry underscores the need for "authentic conversation" among the disciplines. The following is an account of an ambitious attempt to foster such a conversation, with some significant implications for our own time.

NOTES

1. Kenneth Boulding, from *There Is a Spirit: The Naylor Sonnets* (New York: Fellowship Press, 1945).

2. Fritjof Capra, *The Turning Point* (New York: Simon and Schuster, 1982), p.16.

3. Margaret Wheatley, *Leadership and the New Science* (San Francisco: Berrett-Koehler, 1992); Mae-Wan Ho, cited in David Korten, *The Post-Corporate World* (San Francisco: Berrett-Koehler, 1999), p. 103; Fritjof Capra, *The Hidden Connections: Integrating the Biological, Cognitive, and Social Dimensions of Life into a Science of Sustainability* (New York: Doubleday, 2002).

4. See Max Horkheimer and Theodor Adorno, *Dialectic of Enlightenment*, trans. John Cumming (New York: Herder and Herder, 1972); and William Leiss, *The Domination of Nature* (New York: George Braziller, 1972).

5. Wendell Berry, *Life Is a Miracle: An Essay Against Modern Superstition* (Washington, DC: Counterpoint, 2000), p. 23.