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An Examination of the Ecosystems Perspective in Consideration of New Theories in Biology and Thermodynamics.

BARNEY MCDOWELL

Eco-systems perspective and its predecessor, systems theory, have been put forth as the guiding methodological framework for social work. In fact, operationally and theoretically most of these formulations are mechanistic and dualistic. Social work systems theory claims ecology, thermodynamics, and biology as its historical roots. It is, therefore, incumbent on the profession to examine the fundamentals of those disciplines. This paper examines social work's eco-systemic formulations in light of new hypotheses in biology and thermodynamics as well as the ecological crisis of our times. Professionalism will then be discussed as the operational demonstration of social work's mechanistic philosophy.

Social work theorists have invoked general systems theory [GST] and ecology as the guiding lights for social work practice. GST is the cross disciplinary search for a shared core of epistemologies to explain the most complex of systems. In social work formulations of eco-systems perspective, Allen-Meares and Lane (1987) reference the fields of ethology and ethnology while Siporin (1980) cites biological ecology and information theory. Numerous others reference an outdated (Martin & O'Connor, 1989) and non-consensual interpretation of the second law of thermodynamics (Weber, Depew, & Smith, 1988, p. 3) and almost all credit general systems theory. While social work literature references these "hard" sciences to corroborate their theories, that same literature leaves the reader without an examination of the philosophical assumptions of that science. In this paper, some core concepts and assumptions of systems and ecological theory are explored as well as new hypotheses in biology and thermodynamics. Biologist Rupert Sheldrake's hypothesis of morphogenesis with his critique of the theory of genetic causality will be introduced along with Nobel Laureate Ilya Prigogine's non-equilibrium thermodynamics. In an attempt to jolt the reader across the premise-boundaries of the

"normal science" of social work, their theories are offered 1) to underscore the inadequacy of the engineering and marketing paradigm which dominates social work and 2) to support the alternative institutional forms suggested by Ivan Illich (1971).

The Failure of Engineered Systems

In the 1960's, creation of genetic hybrid seeds was hailed as an end to human starvation—the green revolution. Hybrids were manufactured which produced greatly increased yields. There were warnings in the early 1970's that these seed varieties might not withstand adverse conditions like drought. This is exactly what happened. Famine and the death of millions around the globe resulted (Mooney, 1979) when hybrid seeds failed against fungus, high winds, and unusual weather conditions! The hybrid seeds didn't have the encoded "wisdom" of native seed varieties which benefitted from centuries of relationships with earth and elements. By 1984, there was a scramble around the world to recover forgotten buckets of "native" seed varieties from the barns of forgotten farmers. Narrowly purposeful geneticists failed to account for the multitude of transactions which besieged their hybrids. Perhaps, a sub-system (hybrids under experimental conditions) was successfully engineered, but the whole system was beyond engineering control. Of course, those millions of deaths stand in the shadow of political and economic forces as well as the Promethean scientific arrogance of geneticists. The geneticists didn't err alone or simply by miscalculation. In Bateson's (1972) terms, their errors were grounded in our society's self-selecting epistemology: the purpose of controlling nature as paradigm.

Bateson (1972) drew very large system boundaries in order to bring into relief the importance of human purpose. The common engineering application of systems concepts involves defining the system boundaries beyond which all effects can be calculated as negligible. A refrigerator which gives off too much heat must be redesigned. The insulation in a high rise is weighed against energy loss on a cost-efficiency basis. In the 1980's, global warming was just one example of startling feedback about the choice of boundary design which postulated

heat exchanges as negligible. Holes in the ozone are feedback about the neglect of a different boundary vector, the molecular nature of refrigerants passing across that boundary. Unfortunately, so called eco-systemic solutions typically seek to add more sophisticated feedback loops, more refined controls, to re-engineer the disasters of our engineering and marketing way of life; in this they are merely a subset of the mechanistic problem-producing-solution which excludes fundamental vectors of human consciousness like purpose or wishfulness. Where we eliminate that feedback, we have ceased thinking in terms of broad systems concepts and revert to an engineering mode of linear causality: How do we build the system in order to cause the desired effect?

Bertalanffy (1981, p. 116) warns that systemic ideas are most often merely applications of engineering principles to more complex problems. That is, purpose and goals remain primary though increased degree of difficulty is acknowledged. Typical of the social work field, Longres (1990, p. 8), a systems advocate, dismisses Native American Russell Means' critique of European rationalism and "its assumption that progress is possible through the use of technological inventions—including the technology of social welfare—to overcome human suffering." Longress asserts without argument that western social work must continue to try to fix things: "In the meantime, social service workers ought to realize that progress through the use of rational planned change . . . is what social services stand for". In other words, he presupposes the priority of rational purposefulness to effect control irrespective of how large the system is. Ironically, he dismisses Mean's critique without a rational argument. However, general systems analysis indicates that boundary considerations for social welfare are mind boggling from an atomistic perspective. While in physics the movement of two bodies in a gravitational field can easily be predicted, the three body problem is so complex that it hasn't been solved in 400 years (Hagihara, Y., 1970). Bremmerman estimated that 10^{47} is the most information that can be computed per gram of matter in an imaginary computer of fantastic efficiency, but permutations of elements in very simple systems quickly go beyond the "Bremmerman limit" (Klir, 1972). Consider the formation of

something as simple as a visual image; it is far too complex to be explained in terms of the summation of transactions between component cells (Ashby, 1972). Systems theory will never be adequate to explain human behavior in terms of calculating transactions in order to control life though it may appear so in the short run or a narrow context.

Examples of current ecological "solutions" are more efficient refrigerators, non-leaking microwaves or drugs with fewer side effects for schizophrenia. However, these solutions still focus on the paramount if implicit system dimension of performance within the same purpose. Wolfgang Sachs (1990) reviewed over eighty world watch documents, reporting on the state of the earth's ecology. Virtually, all of these argue for efficiency and preservation as a solution to ecological disasters. However, there are many others, including ecofeminists (Plant, 1990), with Sachs who expose the racist, sexist, and ecologically disastrous effects of this philosophy. For example, the efficiency model indicates to end exploitation of the Amazon because Amazonian plants are the resource for many major drug discoveries. The use and dominance of nature are still the underlying philosophy in this engineering solution. In contrast to the engineering efficiency paradigm, many indigenous cultures historically considered themselves and the earth through a sufficiency or wholistic, "as is" perspective, alive and worth revering as an expression of life—not as a resource for the human form of life.

Social Work: Determined to Engineer Life

Allen-Meares and Lane (1987) adopt eight key concepts of "eco-systems perspectives" for social work assessments. One of these emphasizes determinism as a property of living systems analysis: "The relationship of the parts within the ecosystem are considered to be orderly, structured, lawful, and *deterministic* [emphasis added]" (p. 518). As discussed later, this is antithetical to much of modern science. Determinism implies a set of laws which if known along with the initial conditions of the system permit prediction of the system's behavior. Then to the degree that complementary technology is available, the system can be engineered for the desired result. Social work language is clearly an engineering/marketing metaphor. Populations are

targeted. Social services are tested by experts and prepackaged before delivery. Linear accountability is supposedly based on a cost-benefit analysis. In social work lore, the distinction between human service organizations are the people themselves" (Holland & Petchers, 1987, p. 204). But there is no scientific basis for that raw dualistic analogy; it is an engineering, manufacturing metaphor!

The deterministic view serves social work's conception of professionalism. Professionals stake the right to determine in theory and in court the "self-determinism" of the client. This legal/moral claim is based on an extension of what is rationally right or wrong as distilled through the prevailing dualistic paradigm. Professionalism denies creative self initiative by delimiting the boundaries of self-determinism by virtue of superior theoretical and technological knowledge. Counterpoised to this stands the work of leading intellectuals as well as indigenous people. The life work of Ivan Illich (1971, 1976, 1977) illustrates the destructive effects of professionalism to cultural and biological diversity. With Illich, Noam Chomsky (1987, p. 37) and Felix Guattari (Elkaim, Prigogine, Guattari, Stengers, & Denenbourgh, 1982, p. 67) decry the professional guild mentality's repression of the boundaries of inquiry by promulgating the internalization of the political presuppositions of the status quo. Many indigenous people and ecologists around the world are increasingly vocal against professional experts whose engineered solutions of re-engineering the ecology of the earth boomerang back with insulting destruction (Mooney, 1979); Woodhouse, 1987; D'Souza, 1990). Further as this essay emphasizes, recent scientific analyses in both biology and thermodynamics have dismantled determinism.

Sheldrake: Genetic Morphogenesis Is Dead

Rupert Sheldrake (1981, 1988) firmly establishes the failure of the consensual atomistic attempt to explain the forms of life in terms of genetic determinism. This is relevant to social workers who labor in pathological model-environments abounding with linear or cybernetic explanations of, for example, the genetic basis or predisposition for alcoholism, schizophrenia, or physical disease. The implications of his theorizing extends conceptions

of what an ecosystem is as well as the very presuppositions of science. His work resonates with the thermodynamic work of Nobel Laureate, Ilya Prigogine; both conclude that the so-called laws of nature are evolving and both emphasize the self-organizing principles of natural phenomena. Mechanistic interpretations of professionalism in the name of eco-systemic ideas will be addressed in light of the theories of Sheldrake and Prigogine.

Morphogenesis means the coming into being (genesis) of form (morpho). Explaining morphogenesis has been at the crux of Western biological, philosophical, religious and systems thought. In the 20th century, the prevailing belief of professional biologists has been genetic determinism; genes cause the shape, color, size, etc. of your body within the constraints of the environment. The genotype is the template for the phenotype in a one way casual relationship. In somewhat more technical terms, Sheldrake calls this the central dogma of biology: "genetic material acts as a template for the synthesis of proteins, but never the reverse" (1988, p. 80). Over most of this century it was heresy to challenge this view. However, in the last decade many biologists have come to the firm conclusion that genes or gene programs explain very little of morphogenesis.

Materialist versus Vitalist Philosophy and Science

Sheldrake discusses the evolution of morphogenetic theory as a dialectic between materialist and vitalist philosophy. The dominant modality of science is materialist: life processes can be described in terms of machine models which are governed by the laws of nature. For example, the earth has a mass which is acted upon by gravity, producing movement which wouldn't exist in the absence of the gravitational field. The law of gravity is considered to be constant, eternal and independent of the earth's existence. At the molecular level there are gravitational, electromagnetic, and sub-atomic forces which determine chemical reactions. Natural selection, popularly considered a mechanistic biological law, makes an offer that can't be refused to each particular genetic configuration. The deterministic, mechanistic assumption is that the behavior of larger organisms will be explained in terms of cellular, biochemical, genetic, and ultimately

sub-atomic forces once the details are sufficiently articulated through physics and chemistry.

Sheldrake traces the philosophical roots of this mechanistic materialist view back to the dualism of Plato, who thought the real world to be a mere reflection of unchanging ideals; this parallels scientific changeless laws of nature (ideals) describing everything from the motion and changes of planets to the effects of human hormones. But this model is dualistic—built on a contradictory foundation. Changes (in nature) are described as derived from changeless laws (in archetypal or mathematical realm). In other words, hardcore materialists base their theories on purely transcendent, eternal laws; they are metaphysicians underneath.

Opposing the mechanistic mode is the vitalist tradition. Aristotle's concept of *entelechy* posits a soul which informs everything with a template of its destiny (including its form). Many indigenous tribal people held such a world view, sometimes known as Animism. This view foreshadows Lamarck's hypothesis that structure follows function. For example, giraffes grew long front legs and necks out of necessity in a environment with lots of high food and little low food; future generations of giraffes could inherit those traits. Darwin couldn't escape this completely; he postulated a *nivus formativus*, an inner creative force for change. However, he opted to dismiss the degree of its creative potential in comparison to natural selection. Sheldrake documents the whole history of the struggle between the two world views and demonstrates the inadequacy of the materialistic explanations. Though much empirical evidence supported this intuitively appealing model throughout this century, the functionalist view lost favor in the Western Hemisphere where a Platonic template, as a commitment to control nature, dominated not only biology but all scientific methodologies and, perhaps, the ecosystem of the entire earth.

Historically, the idea that genes could determine morphogenesis ran into trouble. "What genes are known to do is to code information for the sequence of chemical building blocks in RNA and protein molecules. Thus they help to provide a detailed understanding of the way in which organisms inherit their biochemical potentialities. What they are not known

to do is to code for morphogenesis for inherited patterns of behavior" (Sheldrake, 1988, p. 88). Sheldrake quotes Brenner: "At the beginning it was said that the answer to the understanding of development was going to come from a knowledge of the molecular mechanisms of gene control. I doubt whether anyone believes that any more. The molecular mechanisms look boringly simple, and they don't tell us what we want to know. We have to try to discover the principles of organization" (p. 94).

To remedy the insufficiently complex gene, the concepts of selfish genes and gene program were invoked. Biologists went on a search to decode the program with the promise of one day molding life itself. Genes were suddenly spoken of as competitive, selfish and ruthless. In this they followed Darwin who apologizes for personifying nature because it's "difficult to avoid this ambiguity" (Sheldrake, 1988, p. 272). A gene program was postulated to inhere in the sequencing of individual gene molecules. Numerous objections arose to this concept and many biologists recognized its inadequacy while continuing to propagate it. An international group of biologists concluded in 1981, that "studies of the development of the nervous system have shown that the notion of genetic programming is not only defective at the conceptual level but also represents a misinterpretation of the knowledge already available from developmental studies" (Gerhardt, et al., 1982, p. 112). For this paper's thesis, the paramount objection is that "program" is inconsistent with the mechanistic claims of a materialist world.

Programs are described as "instructions", "messages", and "information". The latter recalling the informing notion of entelechy. Underneath its hard science veneer, a genetic program has a heart—it is a vitalist idea. Normal science never left the metaphysical realm because it always depended on the ideal of eternal transcendent laws. In a materialist dominated context, it became embarrassing to inquire where the animistic program inhered. Sheldrake proposes an alternative synthesis sketched below.

The presence or absence of particular genes will strongly correlate with differences in form. For instance in *Drosophila*, a

fruit fly, the presence of a certain gene may result in a double set of wings which do not appear with statistical regularity without that gene. This does not prove genetic causality.

To see the force of this point, consider the analogy of a radio set. A mutation in one of its transistors might cause the sounds that it is producing to become distorted; and a mutation in one of the components in its turning circuit might cause the set to pick up another radio station; an entirely different series of sounds would come out of the loudspeakers. But the fact that mutations in the set's components can cause differences in the sounds the set produces does not prove that these sounds are determined or programmed by the components of the set. These are necessary for the reception of the program, but the sounds are in fact coming from radio stations and are transmitted through the electro-magnetic field. **The mutant component is not a component "for" a particular program or type of sound** [emphasis added] (Sheldrake, 1988, p. 90).

Sheldrake postulates an immaterial biologic field paralleling the electromagnetic radio field. The fields have morphogenetic potential. He suggests that biologic fields evolve—they are living; behavior of creatures is governed by the fields but is also formed by behavior over time. Fields evolve out of experience through repetition over time. Laws of nature are like learned habits. The more a pattern is repeated, the more likely it is to stabilize and recur, but they are living, changing fields. Of course, some patterns like relationships in sub-atomic particles have had trillions of trillions of repetitions and so they are likely to appear as absolute. Relatively new patterns like functional behaviors of animals are newer and thus less grooved. Sheldrake cites many examples which are consistent with his hypothesis. A few will be mentioned here not to advocate for his particular theory, but to underscore the inappropriateness of ignoring the contradictions in the consensual view.

There is an apocryphal version of morphic resonance called the hundredth monkey theory. The story goes that after one monkey learned to wash sandy tubers to be used as food then other monkeys quickly learned the same behavior. The real surprise is that when a critical number of monkeys learned the

behavior then monkeys on other isolated islands suddenly were able to wash tubers for food. Sheldrake explores this theme through many dimensions including animal behaviors in the wild and in the lab, human learning behaviors, evolution, and crystal formation. For example, an experimenter bred strains of rats into dull and bright strains selected by learning experiments. The current genetic model predicted that bright rats will beget relatively brighter rats and vice versa. This is exactly what did happen. However, succeeding generations of dull rats actually learned faster and faster. This experiment followed similar experiments performed at Harvard, Australia, and Scotland. Assuming well designed experiments, this evidences a potential contradiction in the genetic causality model. But according to "morphic resonance" theory, there is a learning field, a biologically sensitive field, which becomes more firmly "canalized" with repetition. a similar explanation is consistent with the formation of crystals, the behavior of birds, and experiments with human memory.

In this cursory consideration numerous alternative common sense objections may occur to the reader. There is no claim that there is sufficient evidence to elevate the morphic resonance hypothesis to a theory. Space does not permit a thorough review of Sheldrake's pragmatic and methodical approach in examining the existing and alternative models. A few points need to be stressed. Less stable fields are subject to more radical changes; they have a more responsive nature and thus are less predictable. Thus descriptions of fruit fly behaviors are less likely to maintain over time than descriptions of gravity. Experiments in fields subject to more rapid changes over time are less subject to the (usually assumed) experimental criteria of repeatability.

The implications are obvious for contemporary society characterized by instability and change. In no way, can it be proven that human or biological ecosystems are in equilibrium presently. Sheldrake cites the work of Nobel Laureate Illya Prigogine in the self-organizing principles of non-equilibrium thermodynamics in developing his hypothesis.

Prigogine: Atomistic Determinism is Dead

Classical physics wrote a set of prescriptions (laws) which applied over all time and, thus, emphasized stability and permanence. Prigogine points out that there was no room in these formulations for non-cyclic changes over time—evolution. Rather, than viewing the world as subjected to sovereign laws of nature cut from an external template, Prigogine was able to model out innate self-organizing principles in chemical reactions, ecosystems, regulatory cellular processes, and traffic patterns among many other applications. His work draws on an examination of the history of philosophical and scientific thought (Prigogine & Stengers, 1984) and highly technical mathematical and chemical investigation (Nicolis & Prigogine, 1977). The self-organization of systems in contrast to an external Platonic and deterministic organizational template is the main aspect of his work that I wish to emphasize. Prigogine demonstrated that change towards increased complexity (decreased entropy) takes place in far from equilibrium conditions. This occurs when fluctuations or errors in random activity are amplified and grow into viable “dissipative structures”. The growth of a town along a river is a simple example of a dissipative structure, a configuration which is propelled to greater complexity through a continuous flow of energy. Suppose that a town comes into being for an industrial purpose. A town maintaining at equilibrium for years, may experience economic or social changes so that while the town may be continue to appear stable, under the surface turmoil is brewing and it is far from equilibrium. Then, a very small stream of new energy may be incorporated such that the town takes a quantum leap or, conversely, a city may die quickly when a small, but critical, flow of energy is cut off.

In some localities, far from equilibrium conditions, instabilities trigger new structures. A phenomenon called the Benard’ convection cell illustrates this. Picture a glass casserole dish filled with water at room temperature. There are trillions of molecules bumping into each other and exchanging energy in an amorphous pattern of random collisions. If you put your finger on the side of the dish, some nearby molecules pick up the body heat and move faster with more energy. However, the extra

energy of any particular molecule is instantly redistributed—at high atomic speeds there are so many collisions per micro-second that the energy of the body heat is virtually instantly diffused through the whole system. Under the old atomistic assumption, the behavior of a small group of molecules must conform to the dictates of the overall system norms—temperature, pressure, volume, and random movement patterns. But this isn't so.

Now, imagine that heat energy is applied to the bottom of the dish. At a critical temperature, cellular patterns, called Benard' convection cells, appear in the water. The width of these cells is almost a centimeter, 10,000,000 times the distance of molecular forces—deterministic molecular forces can't explain the patterns which are self-organizing phenomenon on a different logical level than molecular forces. While the molecules of one convection cell rotate to the right, in the adjacent cell rotation goes to the left. Interestingly, the direction of rotation can never be predicted—it is indeterminate.

The importance of the non-equilibrium vector is crucial. Consider, the moment just before the critical temperature is reached. The water has more energy; the molecules move much faster though their movement is still amorphously chaotic, imagine something like snow on a TV screen. Though the system exhibits the same structural properties, it is now far from equilibrium; then, a finger to the side of the dish though providing a minute amount of energy is a sufficient amplification to set off the new inherent structure-convection cells—which can accommodate more energy. Other experimental designs using water and the infusion of energy demonstrate a sequence of structural development: One structural configuration remains stable while accommodating increasing energy flows until, at a critical point, a turbulent period ensues followed by a reorganization to greater complexity which accommodates more energy (Swinney & Gollub, 1978).

These self-organizing and indeterminate features in far from equilibrium conditions can be demonstrated in many other more complex phenomena in both organic and inorganic activity. Hoffman (1981) and Elkaim (1985) have both proposed this notion from Prigogine's work for a theory of family therapy. In

processes far more complex than convection cells, the dissipation of energy may amplify initial instabilities to favor further instabilities which may result in new evolutionary structures. Ferguson (1979, p. 165) summarizes:

The more complex or coherent a structure, the greater the next level of complexity. Each transformation makes the next one likelier. Each new level is even more integrated and connected than the one before, requiring a greater flow of energy for maintenance, and, is, therefore, less stable. To put it another way, flexibility begets flexibility. As Prigogine said at a higher level of complexity "the nature of the laws of nature changes".

In traditional thermodynamic explanation, the statistical chances were virtually zero for a small sub-system of billions of molecules to behave coherently beyond the macro statistical laws governing the behavior of those molecules. That was the thermodynamic version of determinism. But systems demonstrate spontaneous creative organization which is not predictable (Nicolis & Prigogine, 1989). While Sheldrake's work is more explicitly organic in allowing for the innate "intelligence" of systems, Prigogine describes creative self organization through random processes which defy prediction.

Implicit Theory of Institutional Structure

In contrast to Allen-Meaures and Lane's (1980) deterministic ecosystems approach for social workers, Prigogine (1989, p. 399) is explicitly non-deterministic: "The notion of instability has in some way been ideologically suppressed for the phenomenon of instability leads naturally to very serious problems. . . . The world of unstable phenomena is not a world we can control, any more than we can control human society in the sense that extrapolation in classical physics led us to believe." He comments that there are no risks or ethical dilemmas in a deterministic world.

In a dialogue with Prigogine about family therapy and non-equilibrium thermodynamics, Guattari (Elkaim, et al., 1982, p. 65) interprets Prigogine's work in opposition to "the strengthening of power groups that are interested in a policy of standardization". Guattari characterizes those policies as effected

by a professional "scientific" superego which imports external constraints on local systems. Of course, such standards are the primary focus of social work institutions. Referring to the Council on Social Work Education, Bernard (1987, p. 330) writes, "the council carries out its purpose through accreditation and other standard-setting activities". Similarly, the National Association of Social Workers focuses on standardization. Battle (1987, p. 333) summarizes: "The association works to advance and unify the profession, to develop and institutionalize professional standards".

Countering the professional chauvinism that imposes external standards, Illich (1976, p. 16) calls this the "Age of the Disabling Professions". His work extends Marx's notion of alienation from the means of production to the alienation from the "very ability to do and to make". He defines an institutional spectrum by reframing the political categories of left and right which apply both to capitalist and socialist countries. Right wing institutions impose a predigested program on others, organize production, and rely on unwilling or trained consumption of their products and services. At the left end of the spectrum, institutions facilitate activity defined by the user (self-organizing) and offer relatively spontaneous use (indeterminate); their few regulations are geared to prevent the abuse of general accessibility—not to enforce use. Law enforcement and the military/defense complex are obvious right institutions, but more profound is the insidious oppression of the educational system. Schools are compulsory at lower levels yet closed at upper levels to those who don't consistently advance their credentialed status. The telephone network (not the corporate structure) offers an alternative; the phone system can be used by virtually everyone—it is inexpensive to make an individual call; it can be used virtually anytime of the day or night; it can be used by anyone (including the hearing impaired to a lesser extent). The postal system demonstrates similar access and constraints. A typical restriction of these institutions is a law to stop harassing phone calls or junk mail, not a requirement to use. Parks and hotels are other examples towards the left of the spectrum. The medical industry, with social work at its side, tends toward the right.

In *Medical Nemesis*, Illich (1976) makes the case that the commodity intrusiveness of medicine has expropriated the cultural imagoes of healing, the ability of people to creatively suffer and care for themselves. Birth and death have become medicalized with enforced consumption of treatment. It is impossible to make the case in this brief space given the pervasiveness of the myth of modern medicine. Only a few examples can be discussed. Most of the total decline in the death rate due to scarlet fever, diphtheria, whooping cough and measles occurred before the introduction of antibiotics or immunization. The vast majority of successful drug interventions involve a few dozen drugs which do not require a doctor to administer except by laws requiring doctors. Most of the reduction in infant mortality was due to sterile procedures. One out of five children admitted to a research hospital emerge with an iatrogenic disease.

Specific iatrogenic disease isn't the target of this critique, rather cultural theft is—political orthodoxy masquerading as scientific truth! Medicine “reinforces a morbid society that encourages people to become consumers”; this yields a cultural iatrogenesis which “consists in the paralysis of healthy response to suffering, impairment, and death” (Illich, 1976, p. 33). Licensing requirements, whether in education, construction, or psychotherapy, constitute a systems boundary which neglects the healing aspect for people in actively self-organizing one's healing which is, *de facto*, characterized as passive consumption. Under the auspices of a Platonic professionalism, accreditation and licensing standards perpetrate this type of iatrogenesis which is not only racist but at the core of alienation in the modern world.

Professionalism versus Self-determinism and Self-Organization

In Germain's (1980) discussion of professionalism in health care settings from an “ecological perspective” her primary concern is the social worker's professional status *visa vie* the medical profession: “With competence and identity well in hand, a hospital's social work staff and individual social workers are in a position to gain professional autonomy” (Germain,

1980, p. 1). By autonomy she is "referring to a fully accountable and responsible practice through mechanisms for quality assurance, peer review, and consumer evaluation" (Germain, 1980, p. 1). Resonating with most historical social work analysis, Germain acknowledges "concern for reducing social distance and power differences between worker and client" and dutifully qualifies it by affirming a "commitment to mutuality and reciprocity between client and practitioner to the degree permitted by the client's age, physical condition, capacities, and life style" (Germain, 1980, p. 6). Are we to assume that professional expertise will define the "degree permitted"? Unlike Sheldrake and Prigogine, Germain doesn't discuss the philosophical or historical premises underlying the concepts of accountable or professional. The assumption is that health is appropriate adaptation to the environmental norm but environment is then defined in terms of professionalism. For example, of 15 factors describing "environmental needs", second on the list compiled by Hepworth and Larsen (1990, p. 248) is "access to specialized health care services (e.g. physicians, dentists, physical therapists, hospitals, nursing homes)". Germain implies that the institutional structure of medical settings is scientifically consistent with the client's best interest.

Crediting Germain as a major contributor in the evolution of social work's use of systems theory, Martin and O'Connor (1989, p. 76) flail against the tyranny of an outdated conception of the Second Law of Thermodynamics (1989, p. 51). They are direct in confronting the facts that professionals often have the power to "determine the standards and procedures by which deviants (or people with problems) are recognized" (Martin & O'Connor, 1989, p. 97). Though careful to warn against reductionist tendencies ascribing ulterior motives to helping agents, they echo Germain's definition of professional autonomy; in their discussion of professional-client relationships, they conclude that "social workers' legitimacy rests on their education, licensure, and employment credentials but particularly on their employing organization" (Martin & O'Connor, p. 104). But the vectors of "education", "licensure", and "employing agency" do not reside in the client except as the client is an extension of those institutions. Claims that the client issues the legitimacy

as tax payer or voter is a distorted equation leading back to the client as the legitimate source of society's inequities.

In stark contrast, Illich views the heteronomous aspect of that "legitimacy" as the cutting edge of exploitation and racism. I propose that education and licensure are stultifying institutional boundaries and bias, which, by their nature, squelch self-organization with the claims of expertise in a deterministic and objectifying engineering technology. Graduate schools supposedly scramble to find faculty candidates from political minorities, but there wouldn't be a scramble if those schools didn't give priority in hiring policies to doctoral degrees even as devotion to "cultural competency" is claimed. A community mental health center in a minority neighborhood hires a white MSW to work with children who, the center claims, would do better with a role model from their own culture and race. However, the white person is hired because the MSW is given higher priority over cultural resonance and knowledge.

Further Implications for Intervention

The CSWE and the entire accrediting-licensing nexus fits Illich's (1971) institutional spectrum model. The set, called scope of responsibility that can be assumed in society, is defined by elements like post graduate degrees which are expensive and require previous and culturally specific schooling—unless you show a receipt for a B.S.W., you may not have the opportunity to purchase an M.S.W. permitting legal participation in healing at that level. Social Work schools proudly attempt to more efficiently recruit political minorities who are only insufficient to heal by virtue of the schools' participation in institutionally racist standardization claims. I am not opposing politically expedient "cultural competency" requirements or affirmative action hiring policies but rather placing them in the context of standardization policies. In systems imagery, "technical and managerial measures taken on any level to avoid damaging the patient by his treatment tends to engender a self-reinforcing iatrogenic loop [feedback] . . . analogous to the escalating destruction generated by the polluting procedures used as antipollution devices" (Illich, 1976, p. 34). I imagine an alternative graduate

school in which groups of 12 to 24 students are supported to make a creative response to social conditions. Their response, judged by specific facts rather than an *a priori* template, would meet the response of local conditions. Certainly, many groups wouldn't produce in their terms or those of potential employers, but others would flourish in creative self-organizing expression that is currently cast in the shadow of the CSWE's brand of the professional persona.

The organizational structures of Alcoholics Anonymous and its many offshoots fit Illich's model of a left institution: everyone is invited, it's accessible, and a minimum of rules (e.g., no cross talk) prevents abuse of the common forum for listening and speaking. Ironically, professionals find it necessary to refer their clients to such free groups which provide a powerful healing forum according to millions. Carl Jung, whose work evokes Sheldrake and Prigogine, is credited with the inspiration for AA by its founder (Lovern, 1985); Jung directed a client to a spiritual journey for which the client was substituting alcoholic spirits. Without demonstrating an isomorphic relationship between the structure of AA and the philosophy which inspired it, I believe the following examination of Jungian thought suggests potential for incorporating principles of Prigoginian self-organization into institutional interventions.

Jung's psychology referenced vast system boundaries calling for an examination of specific empirical data whether in mythology or clinical cases—the "extraordinary diversity of individual life necessitates constant modifications of theory" (Jung, 1954, Vol. 16, p. 41). In contrast to Freud's Newtonian template (Grof, 1984) of sexuality as the deepest repression, Jung saw God as the deepest repression; that is, God, not as an orthodox belief, but as an empirical fact of the human psyche as evidenced in the historical data of literature and art. The psyche emanates from the collective unconscious with boundaries so vast that indeterminacy rules—spirit is marked first by "the principle of spontaneous movement and activity" (Jung, 1958, p. 67). Sheldrake (1988, p. 253) concludes that Jung's archetypes are innate psychic structures or energy configuring patterns corresponding to morphic resonant structures. Like Prigoginian dissipative structures, Jung describes individuation

as the development of increasingly refined awareness through the progressive integration of different archetypal psychic structures, each of which holds more energy from the unconscious than the previous constellation. If successful, that process culminates in the integration of the archetypal energies of the Self which is the name that he gives to the energy configuring pattern which can accommodate the collective energies of lesser archetypal structures. The Self has greater access to the energy of the collective unconscious, a psychic commons which defies engineering or conscious control by virtue of its vastness if nothing else.

Lovern (1985) links AA and Jung to the clinical work of Milton Erickson. Though not developed here, with several authors (Hoffman, 1990; Elkaim, 1985) I wish to underscore the implications of Prigogine's work for strategic clinical interventions, particularly as developed by Erickson. Paralleling other analyses (Rossi, 1985; Gordon and Meyers-Anderson, 1981), Stern (1985) calls Erickson's approach the "theory of no-theory" suggesting Jung's or Prigogine's caveat about distorting the particular with general theory. Offering specific examples of Prigogine's work adapted to therapy, Elkaim (1985) explores the amplification of small fluctuations and indeterminacy to strategic interventions with families. I suggest that elaboration through the filter of dissipative structures will reveal structural family therapy as a temporal subset of strategic therapy and numerous powerful therapeutic techniques will be elucidated.

Conclusion

Much of social work literature about ecosystems perspective hasn't examined the philosophical and scientific roots of its assertions. I maintain that the unexamined premises and absurd conclusion of a mechanistic "eco-systems" philosophy stems from the political orthodoxy of institutional power relations and momentum—certainly not in empirical data. Prigogine's work has been offered (Elkaim, et al., 1982) as a refutation of scientific rationales for deterministic "ecosystems perspective" as well as institutional structures. I do not claim proof of the viability of alternatives but, with Sheldrake, I reject professional

experts' muddled materialist science, which serves as "legitimacy" for current institutional mandates, and, with Illich, I assert my right to offer other institutional proposals. While it is too great a leap to insist that Prigogine's work fully corroborates Illich's institutional analysis, there are unmistakably correlating themes. In any case, the failure of engineered "solutions" like the green revolution and, indeed, the ecological crises of our times calls for a reexamination of the scientific seal of approval on the deterministic or engineering orientation of eco-systems perspective as presented in social work literature.

References

- Allen-Meares, P., & Lane, B. A. (1987). Grounding social work practice in theory: Ecosystems. *Social Casework*, 68, 515-521.
- Ashby, W. R. (1972). Systems and their informational measures. In G. J. Klir (Ed.), *Trends in general systems theory* (pp. 78-84). New York: Wiley.
- Bateson, G. (1972). *Steps to an ecology of mind*. New York: Ballentine.
- Battle, M. G. (1987). Professional Associations: the National Association of Social Workers. *Encyclopedia of Social Work*, 18th Edition, (Vol. 2, pp. 333-341). Silver Spring, MD: National Association of Social Workers.
- Bernard, L. D. (1987). Professional associations: Council on Social Work Education. *Encyclopedia of Social Work*, 18th Edition, (Vol. 2, pp. 330-333). Silver Spring, MD: National Association of Social Workers.
- Bertalanffy, L. V. (1972). The history and status of general systems theory. In G. J. Klir (Ed.), *Trends in general systems theory* (pp. 78-84). New York: Wiley.
- Bertalanffy, L. V. (1981). *A systems view of man*. Boulder, Colorado: Westview Press.
- Chomsky, N. (1987). Interview. In (J. Peck, Ed.) *The Chomsky reader*. New York: Pantheon.
- Deleuze, G., & Guattari, F. (1983). *Anti-Oedipus: Capitalism and schizophrenia*. (R. Hurley, M. Seem, & H. Lane, Trans.) Minneapolis, Min: University of Minnesota Press.
- D'Souza, C. K. (1990). A new movement, a new hope: East wind, west wind, and the wind from the South. In (J. Plant, Ed.) *Healing our wounds: The promise of ecofeminism* (pp. 29-39). Philadelphia: New Society.
- Elkaim, M. (1985). From general laws to singularities. *Family Process*, 24, (6), 151-164.
- Elkaim, M., Prigogine, I., Guattari, F., Stengers, I., & Denenbourg, J. (1982). Openness: A round-table discussion. *Family Process*, 21, 59-70.
- Ferguson, M. (1980). *The aquarian conspiracy*. Los Angeles: J. P. Tarcher.
- Gerhardt, J. C., Berking, S., Cooke, J., Freeman, A., Germain, C. B. (1980).

- Social work identity, competence, and autonomy: The ecological perspective. *Social Work in Health Care*, 6, 1–10.
- Germain, C. B. (1984). Social work practice in health care: An ecological perspective. New York: The Free Press.
- Germain, C. B., & Gitterman, A. (1987). Encyclopedia of Social Work, 18th Edition, (Vol. 2, pp. 488–499). Silver Spring, MD: National Association of Social Workers.
- Gordon, D., & Meyers-Anderson, M. (1981). *Phoenix: Therapeutic patterns of Milton Erickson*. Cupertino, CA: Meta Publications.
- Grof, S. (1984). East and west: Ancient wisdom and modern science. In S. Grof (Ed.) Ancient wisdom and modern science (pp. 1–23). New York: State University of New York Press.
- Hepworth, D., & Larsen J. A. (1990). Direct social work practice. Belmont, CA: Wadsworth.
- Higihara, Y. (1970). Celestial mechanics I: Dynamical principles and transformation theory. Cambridge: MIT Press.
- Hildebrandt, H. J., Lawrence, P. A., Nussen-Volhard, C., Oster, G. F., Sandey, K., Sauer, H. W., Stern, G. S., Wessells, N. K., & Wolpert, L. (1982). The cellular basis of morphogenetic change. In J. T. Bonner, (Ed.), *Evolution and development* (pp. 87–114). Berlin: Springer-Verlag.
- Hoffman, L. (1981). *Foundations of family therapy: A conceptual framework for systems change*. New York: Basic Books.
- Hoffman, L. (1990). Constructing realities: An art of lenses. *Family Process*, 29, 1, 1–12.
- Holland, T. P., & Pechters, M. K. (1987). Organizations: Context for social service delivery. *Encyclopedia of Social Work*, 18th Edition, (Vol. 1, pp. 204–217). Silver Spring, MD: National Association of Social Workers.
- Illich, I. (1971). *Deschooling society*. New York: Harper & Row.
- Illich, I. (1976). *Medical Nemesis*. New York: Pantheon. Illich, I. (1978). Towards a history of needs. Berkeley, CA: Heyday Books.
- Jung, C. G. (1954). The practice of psychotherapy. In H. Read, M. Fordham, & G. Adler, (Eds.), *The collected works of C.G. Jung*. (Vol. 16). New York: Pantheon.
- Jung, C. G. (1958) . *The phenomenology of the spirit in fairy tales*, In V.S. de Laszlo, (Ed.), *Psyche and Symbol*. New York: Doubleday.
- Klir, G. J. (1972). Preview: The polyphonic general systems theory. In G. J. Klir (Ed.), *Trends in general systems theory* (pp. 1–18). New York: Wiley.
- Longres, J. F. (1990). Human behavior in the social environment. Itasca, IL: F. E. Peacock.
- Lovern, J.D. (1985). Unconscious factors in recovery from alcoholism: The James-Jung-Erickson connection. In J. Zweig (Ed.), *Ericksonian psychotherapy: clinical applications*. (Vol. 1, pp. 373–383). New York: Brunner/Mazel.
- Martin, P. Y. & O'Connor, G. G. (1989). The social environment: Open systems applications. New York: Longman.

- Mooney, P. R. (1979). *Seeds of the earth: A private or public resource?* Ottawa: Inter Pares.
- Nicolis, G. & Prigogine, I. (1977). *Self-organizing systems in non-equilibrium thermodynamics*. New York: Wiley.
- Nicolis, G. & Prigogine, I. (1989). *Exploring complexity: An introduction*. New York: W. H. Freeman.
- Prigogine, I. (1984). *Order out of chaos: Man's new dialogue with nature*. Toronto: Bantam.
- Prigogine, I. (1989). The philosophy of instability. *Futures*, 21, 396–401.
- Rossi, E. L. (1985). Unity and diversity in Ericksonian approaches: now and in the future. In J. Zweig (Ed.), *Ericksonian psychotherapy: Structure* (Vol. 1, pp. 15–28). New York: Brunner/Mazel.
- Sachs, W. (1990, Winter). The gospel of global efficiency. *Orion*, pp. 46–53.
- Sheldrake, R. (1981). *A new science of life: The hypothesis of formative causation*. Los Angeles: J. P. Tarcher.
- Sheldrake, R. (1988). *The presence of the past: Morphic resonance and the habits of nature*. New York: Vintage Books.
- Siporin, M. (1980). Ecological systems theory in social work, *Journal of Gerontology and Social Welfare*, 7, 507–532.
- Smith, P. (1990, April 1). Coming of Age. *This World Magazine*, San Francisco Examiner, p. 28.
- Stern, C. R. (1985). There's no theory like no-theory: the Ericksonian approach in perspective. In J. Zweig (Ed.), *Ericksonian psychotherapy: Structure* (Vol. 1, pp. 77–86). New York: Brunner/Mazel.
- Swinney, H. L. & Gollub, J. P. (1978). Transition to turbulence. *Physics Today*, 31, (8), pp. 41–49.
- Weber, B. H., Depew, D. J. & Smith, J. D. (1988). *Entropy, Information, and Evolution*. Cambridge, Mass: MIT Press.
- Woodhouse, T. (1987). *People and planet*. Hartland, UK: Green Books.