The Dialectic of Change

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1. Introduction

It would appear that the dialectic between opposites is a universal law of nature. Heraclitus spoke of it metaphorically as "war, the father of all things", and combined with his phrase that "all things flow or change" suggests that the dialectic is a continuously evolving process in nature. The Chinese express it with the Yin and Yang symbol, each side incorporating the other. Toynbee spoke of it as "challenge and response", the tendency for societies to change in response to challenges from their environment. Hegel believed it to be the essence of society as a never-ending process of thesis-antithesis-synthesis, where the conflict between two opposites is dissolved in a new reality. For him the social dialectic was an interchange between the ideal and the real or practical. In his dialectic the ideal provided the challenge, whereas for Marx it was the practical or material reality that stimulated the changes in the ideas governing any given period in history. In cybernetics it can be seen in the feedback process, which corrects or balances the workings of any given mechanism, whereas for Aristotle it was the never ending search for the "golden mean" in a process that required first experiencing or at least knowing the extremes, before the mean could be realized. In relation to our current crisis, it can be seen in part as the general biological and/or social dialect between aggression and cooperation. After several hundred years of experiencing the aggression side, not only practically and theoretically, but also philosophically, we may now need, and hopefully are looking to see if we can find the other side of this particular dialectic.

However, conflict and dialectic are not necessarily the same thing. Conflict may or may not result in a new synthesis, as Hegel envisaged. It may result in the extermination of one side of the conflict, or even the mutual destruction of both sides. Species often disappear from nature when they are no longer "fit' for their environment, and they may even themselves create such a problem, by over populating their environment or "overgrazing" their source of food, for example. Malthus saw this as almost inevitable for the human species, though he was ridiculed because he did not foresee the huge increases in productivity that science and technology would ultimately provide. Now corporate scientists and engineers appear to be equally unable or unwilling to appreciate the unintended detrimental effects of this new technology on the environment, with possible Malthusian effects on the population to be experienced in the future. At the same time, this dialectic goes on, as many scientists and engineers are now working to forestall such a disaster, something quite difficult in the current socioeconomic setting within which technology is implemented. But this is precisely the problem within a social paradigm that separates itself into two separate worlds, that of science on the one side and of society on the other.

The knowledge of such dilemmas is much older than even science, however. An illustration of a non-dialectic outcome of a conflict situation can be seen in the ancient fable of the "Scorpion and the Frog". The scorpion asks the frog to carry it across a stream. The frog refuses, saying that the scorpion will sting it and it will die. The scorpion assures the frog that he would do no such thing, since he also would perish in the process. The frog is convinced and agrees to carry the scorpion, but midway through the journey the scorpion does indeed sting the frog and they are both destined to die. When the frog asks why the scorpion would do such a stupid thing, the scorpion simply replies that it was "in his nature" and he could not change it! Of course, as with all fables many interpretations can be given. I would choose to see it as an example of a conflict situation in which the parasite destroys its host, not being able to appreciate the consequences of its own actions. In such a conflict the dialectic does not evolve; there is no new synthesis that allows both sides of the conflict to survive, albeit in an altered form.

An especially interesting example of such a dialectic outcome can be found in William McNeil's (1976), discussion of the history of infectious diseases, or more abstractly, the conflict between a parasite and its host. McNeil found that in the early phases of an infectious disease the parasites were extremely virulent. Imperialist European explorers had inadvertently brought back parasites from all over the world, and the European populations paid the price with millions of deaths caused by these diseases. However, unlike the scorpion that couldn't change its nature, this conflict in time evolved to the point where both the parasites and the hosts changed. In a new synthesis the parasites gradually evolved into less virulent forms, transposing into troublesome, but not so fatal childhood diseases, while the adult human hosts developed antibodies to control the parasites. When European conquerors, as carriers of infectious diseases (but also of immunity to them) invaded the new world, they had this "secret" weapon at their disposal. Thus, they decimated whole indigenous populations who had had no previous contact with these diseases, as much, if not more, with this weapon as with their military armaments. This was especially true where these populations were more concentrated, such as the Incas, Mayans and Aztecs. But then the Europeans, as social "parasites" who could not change their nature, also in the process decimated their indigenous labor force. As a result, they were "forced to" import slaves from Africa to fill this gap, leading to another parasitic relationship that ultimately led to a civil war in the U.S.A. Every parasitic relationship either evolves into a new synthesis or devolves into the disappearance of one or both parties in the conflict. This is as true

at the social level as at the natural level. Evolving a conflict into a dialectic usually requires "changing one's nature" in order to allow a new synthesis to be formed, and at the social level changing one's nature entails changing one's beliefs and ideas about the world.

2. Need for a Paradigm Change

Thomas Kuhn (1970) has called such a set of beliefs in science, a "paradigm", and changing one, as a paradigm revolution. A scientific paradigm, Kuhn has argued, is a set of largely unexamined, because taken for granted, presuppositions about the world incorporated within the paradigm. They are not, however, subject to the usual experimental testing of theories that is part of the critical approach of science. They are pre or meta-theoretical beliefs about the nature of the universe and about the necessary ways of knowing that universe. They are, in other words, ontological and epistemological assumptions. The only time they come under examination is when anomalies arise, that is, when predictions based upon theory and previous experimentation do not come true in the real world. After enough of these anomalies accumulate, a crisis ensues and new assumptions are sought, usually among a variety of often-conflicting schools of thought. Only when one of the schools appears more fruitful than the others will a new paradigm be constructed and adherents sought and indoctrinated into the new system of beliefs. These phases, according to Kuhn, are erased from the official history of science so that it may appear to be the incremental, progressive history that it is believed to be. The idea of a constantly changing dialectical world does not seem to be attractive to scientists in Kuhn's version of their history, and the general disinterest among scientists themselves in his work would seem to give evidence to this assessment.

Indeed, Kuhn's work has been of much greater interest among social scientists and humanists, many of whom have found common ground with their own understandings of human affairs, having assumed that scientists are also human beings working within a social setting, in spite of their apparent certainty to have found the one true method to knowledge of the universe. Quantum physics has, of course, shaken this certainty somewhat, producing a philosophical enigma that is slowly being taken into account, perhaps leading to another paradigm shift sometime in the future.

3. Society is a (Collective) Human Construct

Kuhn's work refers to a specific sub group of society, natural scientists and those, such as economists and other positivist social scientists, who see no fundamental difference between society and nature and thus the need to examine their ontological and epistemological presuppositions regarding the latter. But the idea of paradigm not only illustrates the social basis of natural science but can also be extended help understand broader human and social existence as well, as, indeed, it had been within a different terminology in the work of anthropologists, phenomenologists and humanists before Kuhn studied the community of natural scientists. What Kuhn hints at as the emotional and moral underpinnings of scientific paradigms is more explicitly analyzed for entire social groups by those authors. For example, Berger and Luckmann (1966) explain, theoretically, in some detail how and why a social paradigm and its accompanying social world would be **socially** constructed, and what this would entail from a human standpoint. The process begins with *habitualization* – successful accomplishment of tasks over time leads to the habitualization of these behaviors, such that they become almost automatic in the consciousness of the individual: down shifting a car into second gear while turning a corner is a formidable task for those first learning to drive, but becomes a part of the subconscious after years of practice. Once any given behaviors have become habitualized they become *typified* and can be used to characterize the persons engaging in them. The postman carries a mailbag and delivers mail, a doctor wears a white coat and carries an air of self-confidence, grandparents act in different ways from parents, etc. At some point these typical behaviors become *reciprocally typified*; we learn how to behave in any given context because we know what to expect typically from the persons involved in that context, e.g., we know how to act in a movie theater, in a store, in dentist's office, at home, etc., and can change our behavior accordingly to accommodate the change in scene. These behaviors are now social; different people engage in specific types of behavior within specific contexts: they are assigned roles and are expected to follow the rules of that context. At this point behavior has become *institutionalized,* in the anthropological sense of the word. The rules and the roles are now often recorded in writing so that they will remain constant even if and when the persons occupying those roles may change. Learning a profession or a trade requires learning the expected behavior that accompanies that social role.

There are no natural laws determining how a particular social group will institutionalize its behavior and create a social paradigm; the only requirement is that they be able to survive individually and socially with the typical behaviors that characterize them. But there is such an immense variety of institutionalized forms of behavior to be found throughout the world that one must believe that there is a great deal of flexibility concerning this social process of constructing reality. It's not a very Newtonian (deterministic) world that humans create.

The *illusion* of determinism, however, is fostered by the fact that none of us is conscious of this process of socially constructing reality. The world we are born into is already socially constructed; it has been, in a process that has been going on for thousands of years. Not that it hasn't changed over that time span, but the process is usually so slow that we aren't aware of it. This is especially true for the children who are socialized into their world through a process of learning,

combined with a dependence relationship that makes it all but invisible to their young eyes. The existing social world appears largely as a deterministic world, depending upon how authoritarian are the socializers (parents, teachers, mass media, etc.), or how inflexible is the social and/or natural world they are born into. Ultimately, and most importantly, we are socialized not only *intellectually,* but also *emotionally* (as our dependent status would require) and *morally* (as the social reality must be seen as legitimate, as good and as necessary in order to maintain social cohesion).

4. Existential Problems Arising Because the Social Order is Not Deterministic

If thoughts and intentions create the social order and not some natural law, then how do we know if our particular social order is the "right" one? Well, of course, we don't, in any scientific sense. So, then, we must establish some criteria on the basis of which to judge the adequacy of our society. This has been the task of philosophy since the beginning of the time when human beings concerned themselves with such questions. What results, with or without a formal philosophy, is a set of moral rules that guide the thoughts and actions of the members of a given society or community. These rules are designed to insure physical and social survival. While the enforcers of these rules may claim metaphysical and/or scientific authority for these rules, they are still human inventions. But since in a dialectical universe they confront a material reality that, as Heraclitus said, is constantly changing, there is ever the need for a certain skeptical attitude towards them, not something encouraged by a deterministic approach.

What our thoughts and intentions confront is a material reality that has been created in part by processes of nature as well as by the thoughts and intentions of others, both past and present. This establishes the basic form of the dialectic through which the philosophical approach must proceed. In other words, there is both a subjective, or rather a shared or intersubjective reality composed of the thoughts and intentions of one's society or social group, as well as an objective reality composed of the natural and social environment created by natural processes, plus the thoughts and actions of others, within or without the group. Persons who work within a Newtonian framework: engineers, economists, etc., tend to neglect the subjective side of the dialectic, while people who work within the humanistic or phenomenological framework, e.g., artists, idealists, etc., tend to neglect the objective or material side of the dialectic. Reification, i.e., forgetting the human origin of all ideas and social events, can plague either side of the dialectic, since even natural science is ideological, especially when applied to society.

The existential problem, then, revolves around the constant danger that society will disintegrate, that the subjective moral rules that hold it together, however dogmatically they may be held on to, will not be adequate to the changing material reality as it evolves over time. This is a philosophical problem not only for those who allow themselves to confront such a problem, i.e., existentialists, nihilists, anarchists, etc., but also even more so for conservatives and "scorpions". The only solution to this dilemma is the willingness to endure a permanent sense of ambiguity and uncertainty. Kazantzakis (1993 [1946]) believed that the ancient Greeks understood this insofar as they had discovered the need to stay close to the narrow path separating the abyss of chaos on the left from the abyss of slavery on the right. As he said (p.78), "Humans have lived, even when wild savages, sometimes in chains and sometimes unbridled". With this understanding of the social order we are now in a position to examine the current economic tragedy.

5. Facing the Crisis in the Active Voice

A colleague of mine in the university, a professor of English, once remarked to me many years ago that all scientists, including, surprisingly, most social scientists, write in the passive voice. As someone influenced by phenomenology and hermeneutics, I returned to some of the articles I had written, and was shocked to discover that I had been doing the same thing. There is, in other words, a culture of science that implies that one must write in the passive voice. Thus, learning to be a scientist requires this, even if it only partially explains the actual social situation being analyzed. In the passive voice there are events and patterns in the world of objective reality but somehow no one is responsible for them. In a deterministic or even a probabilistic Newtonian physical universe this would not be seen as a problem. After all, it is a giant clockwork whose laws the scientist is uncovering. But, how about the social world? Are there no protagonists in this grand social drama? Of course, it is the carry over of positive natural science into social science that has brought this culture of the passive voice. But social science would be severely handicapped if there could be no humans allowed into its discourse. How far can we go with statistical analyses? Mustn't we at some time introduce human ideas and motives into our analysis? Isn't there a difference between the material and the ideal, between subjective and objective reality? Indeed, isn't it the dialectic between these two that constitutes the totality of social reality?

6. Some Questions about the Protagonists in the Economic Crisis
6.1 Is the crisis a chance historical event?

Nothing in human history, according to Protagoras occurs by chance, even unintended consequences occur as a result of human thought and intention.

6.2 Then, who is involved in the creation of the crisis?

The crisis is the result of the thoughts and intentions of many people. The most important of these are:

First, **the executives of the large, multinational (but not only) corporations,** who seek to lower the costs of production (in order to increase their profits) by lowering wages and salaries through unemployment and the fear of unemployment that is generated in the minds of the employees. Also, within the same profit incentive, they, along with the bankers and stockbrokers, wish, through a process of privatization, to purchase the physical and social infrastructure of every country (public services, roads, harbors, beaches, mineral resources, etc.) for "pennies on the dollar".

Second, **the large bankers and stockbrokers,** who seek to gamble and profit, with the continuous compounding of interest on national loans, often "imposed" with the cooperation of economists and the influence of other "persuasive means", as described by John Perkins (2004) in his book, The Confessions of an Economic Hit Man. In fact, they will gamble on any factor that can vary in the marketplace, including those that result from the economic crisis, itself (e.g., the price of goods, the rate of increase in the mortality rate of a given population, etc.). Within the psychology of the stock market, the brokers and bankers, themselves, can and do also cause the value of goods and even enterprises to rise and fall, and to gamble on those variations, ignoring the impacts on the companies and populations that might suffer from these variations.

Third, **political leaders,** for whom power acts like a narcotic and for whom money is the chief means of achieving power. When these leaders are offered the chance to borrow and manage large amounts of money it is difficult for them to refuse, especially when the offer is accompanied by the choice to accept the money or to withdraw from political life, either willingly or with assistance from fate. Most of them accept the loans, either with the knowledge of possible entrapment and its long-term implications or not, as the case may be. In the case where they accept the money, they know that they will be handsomely rewarded, that is, they will be able to "buy" social and political support, which at the same time feeds their "addiction" to power. It is these same political leaders who, on a global scale, create the taxing systems that allow wealth to be accumulated in a few hands. Those who benefit, that is, the super rich are, as a result, ever searching for opportunities to invest their (over) accumulated wealth in stocks, bonds, loans, etc., while also participating in the well known decadence associated with bribes, kickbacks and the general wastefulness that sullies political leadership in such cases.

Fourth, certain **highly rewarded economists,** who, like John Perkins, act as "economic hit men" and, in cooperation with corporate executives and bankers, "bend" their science in order to persuade political leaders to accept both the costly loans, as well as the laws of the "free market" system that accompany them. In other words, they construct mathematical models that "prove" that the projects that will be constructed with the loans are indispensible for the development of those countries, without, at the same time being much interested in how the money is actually used after the loan has been accepted. These economists, of course, are well compensated for their participation in these dealings, with the added reward that they feel they are participating in the exercise of power, if only at a distance.

It is important to remember that all these "protagonists", especially the economists, are not intending evil, because they have been socialized, emotionally and morally, into a certain framework of thought and intention. They act within a paradigm that has been derived from a somewhat truncated understanding of 18th and 19th century Anglo-Saxon presumptions about the nature of social reality. Specifically, they believe that human beings are *by nature* predatory, egoistic, and individualistic, and that we are therefore living in a social "jungle", and, of course, if enough people believe this to be true, it becomes true (Lipton 2008).   Many also refer to Darwin in support of these presumptions in a version of "Social Darwinism" that ignores the fact that, in the phrase that was attributed to him, "survival of the fittest", Darwin would never have implied anything about strength or cunning, but would, in fact, have referred to the ability of an organism to fit into, or be accommodated to its environment.

Fitting into an environment takes on a whole new meaning for us human beings who, with our attribute of (self) consciousness, are significantly different from all other living creatures. *We,* as discussed above, create our own social environment. But at the same time, with the products of our consciousness, that is, with our science and technology, we are now in a position to alter radically both our social but also our physical environment as well. We are now even in the paradoxical position of being able to create a physical environment that we, ourselves, will not "fit into", one that we cannot accommodate ourselves to, one in which we will not survive, in the Darwinian sense of the word, but one which we have created based in part on a distorted idea of what Darwin, himself meant. How ironic!

As a result of this, it would, therefore, seem to be a good time for us to reconstruct our economic theories, and, indeed our entire social paradigm, especially as we come to realize that post Darwinian research is now demonstrating clearly that the evolution of the species has been based more upon cooperation than on predatory individualism (Lipton and Bhaerman 2011).

6.3 What is going to happen in the future?

If the people, themselves, - the "frogs" - do not begin to realize how the dialectic has evolved, the current economic crisis will turn out as those who have created it – the "scorpions" -- wish it to: in continuous and repeated loans with never ending compounded interest payments, with the continuous lowering of wages, salaries and social benefits ever closer to the lowest global level, with ever fewer and more expensive public services and goods, with the increase of poverty, crime and social unrest, etc., and the increase in totalitarianism that inevitably accompanies such chaotic situations, as the dialectic seeks to rediscover its mean.

6.4 What can be done?

There is no formula for resolving such recurring crises. The protagonists of each historical period have had to find their own solution. The responsibility shared by philosophy and science – these were inseparable in their birthplace in ancient Greece -- is to try to discover why those in positions of power and those who follow and assist them believe what they do, thus accounting for the actions that have led to the crisis. With these paradigm insights we can keep the dialectic moving by sharing the information with all the people, causing them to change their beliefs and behavior and try to influence those in power to do the same. Such was the effect of the Club of Rome's publication, *The Limits to Growth,* (Meadows, et al 1972, [2004]) some forty years ago.

Since that time there have been many other contributions to a changing understanding of the world. Quantum physics (Capra 1982, McTaggart 2008) is changing the way that scientists see themselves and understand the world they are studying. Even if they only deal with its mathematics, there is still a residue of spiritual uncertainty among scientists that the quantum enigma has created (Rosenblum and Kuttner 2011). Other scientists are studying and mimicking nature in a less domineering manner, seeking to understand and apply its billions of years of accumulated wisdom (Benyus 1997). The 1960s countercultural movement also raised many troublesome questions about how people should view their social world. One thing seems clear: if we are to survive as a species we must replace, or at least balance predatory individualism with the love and empathy that leads to cooperation. As a start we can try to appreciate how the human body with its 50 trillion cells manages to survive as a system of cooperative behavior, *without individual cells needing to compete with others in a struggle for survival!*

6.5 Is the Current Economic Crisis Really Something More?

Almost everyone who has read John Perkins' book will have a pretty good idea about what has caused the current economic crisis: too much money chasing too few investment opportunities. "Too much money" reminds of the well-known quotation heard from people as varied as Francis Bacon and Thornton Wilder: "Money is like manure; if it is spread around it will help young things grow and contribute to the well being of everyone, but if it accumulates in one place it starts to smell and becomes a source of disease" (Would cocaine addiction, greed, and the obsessive need for power qualify as diseases?).

Most critical economists will place the beginning of the recent crisis sometime from the middle of the 1970s to the start of the 1980s, and most will also associate it with the rise (or resurrection) of (neo) liberalism, the ideology that only profitable (and, by necessity, private sector) activities are of importance in the world of economics (and, unfortunately, for most mainstream economists, there is no other world). In the USA neoliberalism brought into power the "Wrecking Crew" (Frank 2008), whose goal in life was to turn government into a channel to move public money into private hands, into the "free market", as it were. This money has gradually accumulated in the financial sector, where it has carried out a thirty-year romp through everything from the countries of the Third World to the housing market in the US. It is currently being featured in the southern European countries, as well as Ireland, a group that has been labeled PIGS (Portugal, Italy, Greece and Spain) by the "well-to-do" in northern Europe.

The pattern is the same everywhere: unsuspecting (?) borrowers are enticed into borrowing monies way beyond their means. Once entrapped, they are in permanent debt bondage to the bankers, and their assets rapidly devalued to the point where they must be sold off for "pennies on the dollar". The free floating "manure" can then move in to pile up in new "barns". In the case of countries, public assets can then be turned into private investments, but supplying only those who can afford the higher costs of the public goods that were previously available to everyone. Here, of course, we are talking about such vital goods as water, electricity, harbors, airports, health care, education, retirement benefits, and so forth. The same is true for private assets, such as housing, stores, factories, etc., all of which are devalued and then bought up by those with the extra manure accumulated for such purposes. How and when this economic crisis will play itself out depends in part upon whether the "scorpion" is willing to change its "nature", and/or the frog is able to find a way to escape its fate, both reexamining their paradigm assumptions along the way. In Hegel's terms, this will occur when the parasite and host synthesize a less fatal relationship, thus both surviving (until the next crisis!).

7. Is this Really a Deeper Cultural Crisis?

Meanwhile, one is led to ask, [There I am in the passive voice again!] how could this crisis have arisen, especially since it is not the first time this has happened? Indeed, measures were imposed after the last great crisis in the 1930s, measures that were to insure that no such crisis could ever occur again. Unfortunately, these measures were swept away by the power of money, as financially backed government officials retracted them one by one until the system returned to its former vulnerable position. But, where were the scientists, the economists, during this retraction period? Apparently, as mentioned above, they were caught up in a new (old) paradigm, neoliberalism, which simply washed away all experience of the past. But shouldn't experience count for something in science, especially social science? Well, apparently not, not if your sole purpose in life is to discover universal laws and apply them to the control and domination of nature (and by extension, society, of course, since there is no essential difference within this Newtonian framework). And, indeed, since the time of Newton, this is what science has been all about - at least until now when the meaning of quantum physics is beginning to sink in. As Heisenberg (1958, pp. 15-16, as quoted in Easlea, p. 280) has said, "… we [scientists] must become conscious of the fact that we are not merely observers but also actors on the stage of life".

What I am suggesting is that we may be facing not just an economic crisis, but also something deeper, a crisis of basic beliefs about nature, about knowledge, about the mystery of the universe, about our role as human beings in that universe, about our relationships with each other in society, etc. This would be a "cultural crisis", culture being defined as exactly the set of basic paradigmatic beliefs we have about all such things. Nor is this the first time humankind has faced such a cultural crisis: the dismantling of the ancient Greek civilization, the rise of Christianity and the fall of Rome, the Renaissance and the rise of Newtonian science, the industrial and urban revolutions, and more recently, the communications revolution, to name several from the history of the West.

If we are indeed now at a new turning point, as Capra (1982) has suggested, we might want to review the analysis offered by Theodor Roszak (1969) in his book, *The Making of a Counterculture: Reflections on the Technocratic Society and Its Youthful Opposition* and by Brian Easlea (1973), in his book, *Liberation and the Aims of Science.* Perhaps we should start by trying to understand the series of uprisings that occurred within in a few short months in 1968, in places as distant as Beijing, Prague, Paris and Chicago. These places were not only distant geographically but also culturally and socioeconomically. They represented two different versions of what at the time was labeled communism, and two different versions of capitalism. So the uprisings could not be about the dominant political economic conflicts across the world at the time. They must have been about something else. Perhaps we can find a clue in the Bible in the book of Genesis, specifically Chapter I, Verse 28:

> And God blessed them, and God said unto them: be fruitful and multiply, and replenish the earth, and subdue it; and have dominion over the fish of the sea, and over the fowl of the air, and over every living creature that moveth upon the earth.

It would appear that this pretty much summarizes the role of science and technology over the past several hundred years, to say nothing of the Romans, the crusading Christians, the imperial Europeans, etc., before and after Newton, in their ". . . perpetual and restless [Hobbesian] striving of power after power, that ceaseth only in death" (Easlea 1973, p. 285) This is very likely the underlying provocation for the uprisings of the young during the period of the 1960s, or, at least this is what Roszak and Easlea, and many other philosophers and social scientists believed at the time, including especially Jacques Ellul (1964), Eric Fromm (1941), Max Horkheimer (1947, 1972), Herbert Marcuse (1964), and others from the Frankfurt School. These authors were analyzing the free market societies at the time, but Lebowitz' (2012) analysis of the former Soviet system supports the claim that even in a state controlled system it was technology and the spirit of domination inspired by the ideology of science that was the true source of the student uprisings around the world during the1960s.

Here we can see the importance of Plato's statement that, 'Any science without justice and the other virtues is not wisdom but mere cunning'. One might suppose that one of the greatest complaints today's young people might have, has to do with this absence of a concern about justice within the paradigms of science and technology, an absence that fits nicely with the lack of true justice in society, itself. Since science and technology are in search of universal laws, it is easy to see why they would not feel any concern about justice or any other emotional or moral issues. What meaning could such things possibly have within such an ideological framework? If the countercultural movement that started in the 1960s had valid insights about this, then we must consider this serious problem if we are to extract ourselves from the crisis we are in.

At a more practical level, what does a countercultural movement confront in society as a whole? As we saw above, technology is being used by corporate and financial leaders to "subdue" and to have "dominion over every living thing that moveth upon the earth". There are some scientists, engineers and politicians who are perfectly happy to participate in creating this "dominion". Their minds have been socialized into a philosophy that exonerates them from any concern about the broader social consequences of their actions. Meanwhile, there are also many scientists, engineers, business-

men, professionals, etc., who are busy just doing their jobs within a system of thought that allows them to believe that the best social outcome will derive from everybody pursuing his or her own individual interests, a belief system with a well known pedigree from the 18th and 19th century philosophers of 'possessive individualism' (MacPherson 1962). This system of belief works well for them until they are suddenly dropped out of their privileged class position in a process of downsizing caused by mergers, takeovers, bankruptcies, etc. which some economists, following Schumpeter, like to refer to as 'creative destruction'. But without a new belief system to replace the old one, they are destined to simply hope that they are not really "frogs", and that the crisis will soon be over and everything will return to 'normal'.

At the bottom of, or rather outside, the class system in the West we find those who have lost all faith in the Newtonian culture. They would be today's "cultural creatives", (Ray and Anderson 2000). As a group they constitute over one hundred million adults in especially in North America and Europe. Many of them are from among the counterculture radicals of the 1960s. Most have abandoned the privileged positions they might have enjoyed in the larger society and are seeking to live a simpler life without the unnecessary frills of the advanced consumer culture they have left behind. They are mostly educated and would likely be sympathetic to the new insights of quantum physics, to Schumacher's ideas about the beauty of smallness, as well as to Eastern medical and spiritual philosophies, especially on the West coast of the U.S. They are also much concerned about justice, which they carefully protect in their smaller scale communities.

What does characterize them, as well as all those who see themselves as a part of the counterculture, is their belief that one side of the aggression/ cooperation dialectic has long been neglected in western society. Indeed, we seem to have reached the extreme edge of this dialectic on the aggression side and are in dire need of finding the middle ground or "golden mean" if we are to avoid the fate of the frog (along with the scorpion, of course). Any new paradigm must be built upon the rebalancing of this dialectic.

At the same time we must realize how slow and demanding is the process whereby paradigms are constructed and/or changed, with all of the moral and emotional loadings that are incorporated in this process. *The Limits to Growth* provided a powerful stimulus at the time it was published, but the struggle for environmental awareness is far from over. Newtonian science is ill equipped to undertake this responsibility, simply because it ignores these aspects of human existence, even with respect to its own endeavors. It is also hindered by its paradigmatic belief that *all* technology is good for human existence and that every application is evidence of progress. This might be true if technology were not embedded in social relations, now so heavily skewed in the direction of aggression (Leiss 1974, Easlea 1973). The very success of technology has brought increasing conflict over the resources needed for its implementation, while the distribution of its benefits has been left to the (somewhat less than) free market. The thoughts of progress embodied in the early ideas of science and technology have been distorted by the unthinking applications of their methodologies to human relations; the spirit of predatory individualism is hardly a basis for establishing a social order, and yet it is precisely this, which constitutes the basis of economic theory today. I don't know if there is a mathematics of cooperation that can be as successfully applied to human behavior as has the mathematics of conflict in game theory, but our survival now seems to depend upon it. Maybe this is where we should start our search for a new paradigm.

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