PLANETARY ECONOMIC PROCESSES: THE MISSING COMPONENT OF SOCIO-ECONOMIC THEORY

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The phrase "planetary economic processes" does not refer to the much talked about "globalization" of business and worldwide economic competition. Rather, it refers to the basic natural forces that have from the beginning of life on this planet laid down the possibilities, opportunities, and constraints that operate on all forms of life here. The fundamental planetary (and cosmic) force or process is thermodynamics, or the flow of energy that at once sustains and also signals the eventual end of organic life for individuals and collective groups.[1]

As earthly life has evolved, thermodynamic energy flows have taken two basic forms. One is "economizing" and the other is "ecologizing." The first allows any and all life forms to reach out into their respective environments to acquire and process

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[1] Many other planetary forces operate as well but will not be featured in this account. They include geophysical processes (volcanic action, ocean-floor spreading continental drift, mountain building and erosion, etc.), climatological factors (global temperatures, stratospheric composition and circulation, oceanic temperature trends, etc.), biochemical processes (mutations and other changes in DNA; evolution, appearance, and invasion by new genetic strains; human intervention in DNA processing; renewal and depletion of air, water, land, plant cover, some by human intervention and some by ecological processes); and astrophysical processes (receipt and absorption of solar radiation; solar evolution and fluctuations; solar system movement within the galaxy; asteroidal and cometary orbits that threaten collision with earth; magnetic-field reversals), among other forces not mentioned here.

sufficient energy to sustain life long enough to transmit their genetic systems to future generations. "Ecologizing," the second form taken by thermodynamic energy flows, concerts the separate economizing activities of life forms into interactive, diverse ecosystems. Both economizing and ecologizing are absolute, irreducible requirements for the creation and maintenance of life in all forms found on our planet. My thesis is that socio-economics can be made more comprehensive, more realistic, and more operational and serviceable for human (and humane) purposes by integrating these planetary forces into its conceptual and theoretical framework.

THE SOCIO-ECONOMIC PROJECT

The current state of socio-economic theory can be fairly described, at best, as amorphous, incompletely formed, and facing an uncertain future. I make this charge as a friend who wishes to see the socio-economic project succeed, which may cause some to ask, With a friend like this, who needs enemies? My hope is that a friendly but frank assessment may count for more, and may lead to needed correctives sooner, than a similar critical attack from others less sympathetic to socio-economic inquiry.

What we in this association call socio-economics[2] has many predecessors or ancestors. The seminal thinkers usually include (the list varies by disciplinary source) Max Weber, Thorstein Veblen, Emile Durkheim, Bronislaw Malinowski, Joseph

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[2] Throughout this paper, the term "socio-economics" is used in a broadly generic sense to include the many separate strands of theorizing that conceive economic phenomena to be strongly conditioned by sociocultural values and institutions.

Schumpeter, and Karl Polanyi, to give a small sample of the better-known figures. Clarence Ayres, Neil Smelser, and Kenneth Boulding would be named by various factions in the broader socio-economic community. Currently, one thinks of John Kenneth Galbraith and Amitai Etzioni as the major contributors to socio-economic thought. Others, both earlier and contemporary, could be added. The entire range of socio-economic-like commentary and theorizing takes in what is known as economic sociology, economic anthropology, behavioral anthropology, institutional economics, psychological economics, left-liberal economics, social economics, evolutionary economics, and various other lesser-known branches.[3]

Because all of these founders and builders have been sociologists, economists, economic-social historians, psychologists, and anthropologists, the socio-economic project has been in the hands of social scientists of one kind or another. The central agenda of these social scientists has taken the form of a negative critique of neoclassical (standard, conventional, market-centered) economic theory, especially its behavioral propositions and presuppositions. Fault has been found with rational choice theory; reliance on utilitarian reasoning; the concept of market efficiency; prices as rationers of economic goods; costs as complete measures of risks, harms, and foregone opportunities; markets as allocative mechanisms; capital as a source of economic productivity; and inadequate attention paid to social values and institutions

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[3] Several recent anthologies provide a sampling of current socio-economic thinking: (Burgenmeier, 1992; Coughlin, 1991; Lutz, 1990; Martinelli and Smelser, 1990; and Swedberg, 1993).

and normative phenomena generally. With variation, this story has been told by successive waves of socio-economists. It is fair to say that, from various disciplinary perspectives, each has found a piece of the truth and has thereby advanced the socio-economic project.

However, after several generations of arduous and sometimes brilliant socio-economic analysis, the plain truth is that none of it has carried the day against economic orthodoxy. With great irony, one can say that much if not most of the socio-economic literature mirrors the dominance of a neoclassically-configured market-capitalist economy. Like all of those theories---Marxist, Weberian, institutionalist, and left-liberalist---that have with little effect directed their philosophical ire against the capitalist Leviathan, there is little indication that the continuing socio-economic critique has or will succeed in dislodging neoclassicism or significantly modifying its central institutional mechanisms (mainly, the market-price mechanism, private property controls, and supporting legal systems). Market capitalism grows ever stronger---witness its ideological triumph over the Soviet bloc---suggesting the bizarre possibility that the prominence of socio-economics will grow in tandem with the main source of its theoretical dissatisfaction. This outcome could be likened to theoretical prostitution in which socio-economists profit from the moral (or in this case, the intellectual and philosophical) degeneration of their clients.

Amitai Etzioni, the most recent socio-economic knight to enter the lists against economic orthodoxy, acknowledges the failure of socio-economists to develop an alternative paradigm to the neoclassical formulation. He says flatly, "No such

alternative seems to have arisen." Citing the Kuhnian nature of slow paradigmatic development, and adding the factors of vested ego involvements, professional prestige, and ideological commitments, he notes with little surprise that neoclassicism dominates even in face of its own admitted theoretical shortcomings. Even if an acceptable (though presently elusive) alternative were to emerge, economic orthodoxy could easily continue its sway over the minds of economists, public officials, and ordinary citizens. To this prospect, Etzioni answers: If we can't beat them, let's surround them. He means to place the entire neoclassical paradigm inside another, even more comprehensive one---a societal capsule---thereby showing how the former is a function of the latter (Etzioni, 1988: 2-4).

One can hope that this positive approach will carry more weight than the previous contrarian strategies. If there is to be a stand-alone theoretical agenda of generalizable, empirically testable socio-economic principles, it cannot arise out of the negativistic culture that has been characteristic of the socio-economic project from its inception. The principal block to developing a general theory of socio-economics is the continued fixation on the theoretical and behavioral shortcomings of neoclassical economics---without a compensating effort to build a distinctively new paradigm.

One further trait of socio-economics has played a role in limiting its theoretical reach: Its principal advocates have been <u>social</u> scientists of one kind or another. None is a <u>natural</u> scientist. Quite obviously, an expert social-science-based knowledge of both individual and social behavior has been essential to the socio-

economic critique of the behavioral and organizational lapses of neoclassical economics. No one but social scientists could have done it so well or so thoroughly. But it does mean that socio-economics has become the captive of its originators and current theorists, all of them social scientists. In recent times, few socio-economists have drawn explicitly on natural science to formulate economic theory. The prominent exceptions are Kenneth Boulding (1981) and evolutionary theorists Richard Nelson and Sidney Winter (1982), but their views have not been thoroughly or systematically integrated into the main body of socio-economic generalizations.[4]

The place to begin the construction of a new theoretical framework for socio-economics is with the natural sciences, not the social sciences alone. The natural sciences offer a way to build a generic structure of socio-economic theory, and the remainder of my paper sketches the kinds of insights that can be pulled from the natural sciences to generate comprehensive socio-economic theoretical propositions. My argument will be that there is no other way to launch and sustain an enduring socio-economic project, either in theory, research, or policy. That it must be rooted

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[4] Amitai Etzioni makes brief and somewhat diffuse mention of entropy (the second law of thermodynamics) but does not further use or integrate the concept into his socio-economic theory (Etzioni, 1988: 150-151). Much earlier, Thorstein Veblen utilized the natural science knowledge of his day, particularly in The Instinct of Workmanship (1914) and several papers including his well-known "Why is Economics Not an Evolutionary Science?" written in 1898 and various others collected and published as The Place of Science in Modern Civilisation (1919). Some of the latter papers, particularly those based on then current theories of race, make awkward reading for today's Veblenians. With regard to recent economic theorizing, Philip Mirowski's corrosive commentary on the use (he believes, it was misuse) of natural science by neoclassicists may also create caution (undue, in my opinion). See his More Heat than Light: Economics as Social Physics, Physics as Nature's Economy (1990).

primarily within a naturalist realm need not mean that the social sciences are pushed aside as irrelevant or of lesser importance, for the evolving theoretical architecture of socio-economics houses all of the normative sciences---natural and social alike---whose inquiries and findings shed light on economic phenomena.

EXPANDING THE SOCIO-ECONOMIC PROJECT

Socio-economists need to ask themselves why the market economy, and the market theory that purports to explain economic behavior, have shown such staying power. Even after all allowances have been made for vested interests, selfishness, the privileges of property, prevailing power systems, exploitation of the powerless, the persistence of class structures, and historical inertia generally, it does seem remarkable that these factors alone could have sustained for so long and under so many varying circumstances a way of doing economics that is without any explanatory virtue at all. Contrary to the views of many socio-economists, it <u>is</u> possible to discern a set of core economic functions that are better and more fairly performed by the market economy than by other known forms of economic action. Socio-economists have tended to shun or overlook these positive operational features of market economics, but their existence and persistence through time is one reason why market economics and market theory have enjoyed such a long, though flawed, life.

These positive economic functions can be explained best in the language of natural science. They signal the presence of planetary economic processes that find

outlet through, but do not originate in, the operation of market institutions. These core planetary processes, while economic in their consequences, exist independently of humanly-constructed economic systems. They precede, and exert a more powerful presence than, any given form of economic order devised by deliberate human intention. This is a point of view that will be difficult for social scientists to accept and absorb, who are accustomed to thinking of social invention as the dawn of humanly meaningful activity of all kinds.

We can begin with some of the bedrock concepts of traditional market economics, describing their relationship to planetary economic processes. However, it will become clear that socio-economic concepts and explanations also greatly enrich the picture of economic activity that emerges from an acknowledgment of planetary processes, and in what follows there will be a deliberate interweaving of core themes from both market economics and socio-economics.

Scarcity and Economizing

Both scarcity and economizing, which are interlinked and which together form the basis of standard economic theory, are functions of thermodynamic laws. Resources, and all forms of goods and services that can be made from them, are perpetually in short supply for the simple reason that their production and use automatically convert their energy into a waste stream that is larger than the positive benefits gained from the conversion. This second law of thermodynamics, which invokes the concept of entropy, applies not just to human economy but to all living

forms.[5] Though the earth may appear to be an unlimited cornucopia of abundance, particularly in its earlier days before today's bulging human population, scarcity has always been present. Any economic provisioning effort, whether undertaken by humans or other forms of life, confronts the entropic dilemma. Not only is there not enough to go around (thus producing conflict and/or competition) but the very act of successfully acquiring needed provisions at any given moment diminishes the potential supply of provisions in the future. This ineluctable condition of scarcity occurs and persists because all economic provisioning efforts dissipate (or convert) useful energy into increasingly less useful forms. (Some such process as this lends a touch of naturalistic legitimacy to the Biblical injunction, The poor you have with you always.)

Economizing is not simply the response of living organisms to the condition of scarcity but the process by which any given life unit copes with scarcity and, in the case of humans, attempts deliberately to overcome it, however temporarily. An economizing life form reaches into its environment, searching for the energy it needs to begin and then to sustain its life processes. All economizing involves this energy-acquisition activity, regardless of the outward form given to it either by the life unit's genetic propensities or, additionally in the case of humans, by the particular sociocultural system it inhabits. Without this economizing process, life itself would

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[5] The most fully developed account of this process is Matthias Ruth's Integrating Economics, Ecology and Thermodynamics (1993). Another impressive---even alarming and sobering---analysis of some of the long-term consequences of thermodynamic processes in the economy is found in O'Connor (1994).

be impossible. It is a condition and process laid upon earthly life from which there is no escape (nor is there any reason to want or need to so escape). Oddly, while today's economizing contributes directly and inevitably to tomorrow's greater scarcity, so too does scarcity bring about more intense economizing and therefore more potential competition and conflict among economizers. In either or both cases, though, no life form can forego the temporary respite that economizing offers against the ultimate doom of entropic forces.

Thus, any economic theory has to explain and find a place for both scarcity and economizing since these two features are set, not by human will but by planetary processes. Because market theorists traditionally begin their explanations of economic activity with the concept of scarcity, they at least position economic theory at an appropriate starting point. This cannot be said of socio-economic theory, which skips over this foundation principle and tends to proceed rather directly to a critical analysis of choice behavior. One result is to leave socio-economics without a firm planetary anchor for its basic propositions, which in most versions depend almost exclusively on artifactual inventions of human culture. The differential treatment of economizing that emerges from these two diverse starting points is revealed in the following section.

Rationality and Utility

The inescapable need to economize evokes the concepts of rationality and utility, which have played leading roles in market economics but which have been

subjected to withering critical attack by socio-economists. A careful reappraisal of these important concepts, and their relation to planetary processes, is in order.

Rationality in standard economic theory means that economic actors attempt to make choices that will maximize their self-interest. This entails being well-informed about the quality of goods and services and their costs, alternatives and their costs, the opportunity costs of any given choice, and a knowledge of how any given choice will affect the actor's immediate and long-term interests. An astute level of cognition is attributed to the choice maker. Such rational choices entail careful deliberation and an empirical examination of all consequences that may flow from them. As Etzioni has observed about instrumental rationality, ". . . rational decision making is based on openness to evidence (an empirical orientation), and on sound reasoning (logic). The more the actor is open to reason and evidence, to L/E [i.e., logical and empirical] considerations, the more rational the actor." (Etzioni, 1988: 144)

Socio-economists have spent most of their intellectual capital inveighing against this notion of rationality. Their arguments are probably well enough known here to obviate the need to recapitulate them. (For an account, see Etzioni, Chaps. 6-10.) However, if the neoclassical concept of rationality is considered in the context of planetary economic processes, a second look is justified.

Rational action to promote and enhance human economizing is one of the requirements laid down by planetary processes. Human intelligence that involves careful deliberation, examination of available information, and evaluation of possible consequences increases the prospects that human economizing will proceed with a

greater chance of success than if it is absent or enfeebled. From a species point of view, human intelligence itself is to a large extent a derivative of the genetic properties and potentials of the human neural-brain system; it too is thus a function of another kind of natural planetary process. Recognizing this link between human intelligence and instrumental rationality does not require endorsement of all forms and kinds of human economizing, nor is it equivalent to acceptance of the notions of rationality embedded in neoclassical economics, although it does reveal an implicit normative inference within market economic theory.

Moreover, one can agree that rational behavior can result from both personal and collective efforts to economize, which is one of the telling points made by Etzioni (1988: Chapters 9, 11). One can also recognize that human institutions, information quality, customs, attitudes, sentiments, etc., place many limitations upon the attainment of rational choices and outcomes---the "bounded rationality" notion.[6] But regardless of level or locus of such activity, and in spite of sociocultural inhibitions and prohibitions, being rational is not only an ideal potential expression of human intelligence but one of the great economizing advantages humans have over other life forms, most of whom are left to depend entirely on genetic potentials alone.

At times, one can feel that socio-economists actually celebrate the irrational and nonrational propensities and behaviors of humans and their institutions, so eager have they been to cast doubt on neoclassicism's excessive rationalist claims, which

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[6] James March (1994) has summarized, with remarkable clarity, these and other complexities of organizational decision making that have made the search for rationality a difficult and complex one.

either overtly or covertly assume economically beneficent outcomes. While it is true that the standard concept of rationality is a reflection of an idealized Enlightenment philosophy, and hence sociocultural in origin and justifiably criticized as overly simple and ego-centered, market economists are at least focusing on a critically important kind of economizing behavior that should not be dismissed as simply a culture-bound artifact and thus outmoded. Simplistic, yes. Irrelevant, no.

The same might be said for the idea of utility, which finds pride of place in economic orthodoxy's conceptual pantheon. Though limited there to a self-interested pleasure principle, utility has many other meanings germane to any economizing effort. These include usefulness, practicality, functionality, efficacy, purposefulness, serviceability, and pragmatic effect, among others. Whereas generations of market economists have labored to measure utilities, or failing that, to find proxies, or failing that, to sublimate the notion as an unattainable theoretical ideal possessing analytic usefulness, there remains yet a meaning for utility that is important for socio-economic purposes. If utilitarian traits such as usefulness, adaptive function (through economizing), instrumental practicality, and pragmatic technological accomplishment lead toward economizing activities, can one truly believe the concept of utility is so misguided as to warrant rejection in toto? When considered as collective efforts entailing normative outcomes, rather than merely self-interested and self-centered pleasure seeking, such economizing falls easily into the socio-economic orbit of behavior worth seeking and supporting. That it is utilitarian in method and outcome does not diminish its worth and value as a type of economic behavior.

Market theorists have seized upon at least a portion of the truth about utility and utilitarian approaches. They are aware that human life forms (not unlike other forms of life) are self-seeking and self-promoting economizers, searching for a (sometimes elusive) rational basis for their utilitarian economic choices. Through unexamined assumptions about human nature or from sheer ignorance of natural forces or even from a practical point of view, orthodox theorists may believe that the market expression of this rationalist-utilitarian activity is all of the story worth telling. But it is, of course, only a piece of the truth, and socio-economics insists that such economic activity be placed within a societal context. But unasserted or undiscovered by both market economists and socio-economists is that this driving economizing force is a manifestation of natural planetary processes. Utilitarian procedures and outcomes, when defined in broad enough ways, can be welcomed by both camps. Indeed, neither group of theorists has much choice in the matter since economizing humans must engage in planetary economic processes, like it or not. Like rationality, utility is part of the process itself.

Economic Rationing through Prices

Scarce goods require a rationing system. Market economics posits the price system as an ideal mechanism for economic rationing. Prices are supposed to reflect the costs of bringing any given product or service to the marketplace, including a profit for the producer (which is theoretically treated as a part of the cost up to the point where marginal costs and marginal revenues coincide). The willingness of

purchasers to buy at the prevailing prices signals their apparent belief that the product will fulfill a want or desire. Various assumptions are added regarding the value of money, the source and rationale for incomes that enable market purchases, the disposition of profits as a source of capital and future productivity, and the conditions necessary to sustain a level of competition suitable for markets to clear without abuse of or injustice to consumers, producers, laborers, and other market participants.

Many forests have been laid waste to provide the paper for countless socio-economic attacks on this idealized version of the market's price system. Those many arguments need not be repeated verbatim here. What does require comment, though, is whether the market-price system is so flawed that it is useless as a way of rationing economic goods. When compared with other rationing systems recorded by historians and anthropologists, market pricing scores points. It displays a latitude, an openness, a flexibility, and a degree of freedom of choice that far outstrips the rigid, grossly unequal economic shares typical of feudalism, redistributive systems rooted in autocratic and elitist class systems, reciprocal exchange patterns that reflect tribal and kinship privileges, and modern statist systems governed by dictatorial and/or militaristic cliques.[7]

Most of the socio-economic critique of the market-price system can be granted: prices do not reflect all true costs (the "externality" problem); prices may vary widely

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[7] For examples of various non-market exchange systems, see Polanyi (1944), Polanyi, Arensberg, and Pearson (1957), and Dalton (1967). Mark Granovetter's (1993) essay on the embeddedness principle also illustrates the interweaving of social systems and economic transactions.

from the competitive model due to government decree and/or regulation and monopolistic business practices; incomes used to fund purchases are grossly unequal and only rarely reflect imputed variations in economic productivity of income recipients (the "equity" issue); fluctuations in the value of money produce unjust and haphazard economic outcomes; business cycles introduce gross variations in economic productivity and they are responsible for great economic hardship; etc. Even after accepting these socio-economic strictures, though, one can believe that prices reflect many genuine costs and may be made to include those previously excluded (pollution costs are one example); that market competition is an important force in setting many prices; that incomes are one measure of a society's beliefs about motivation, productivity, merit, need, and fairness; that inflation and deflation of money are controllable except in highly unusual conditions having little to do with economics and much to do with politics; etc. In other words, with all of its faults, a system of market prices remains a viable, useful way to ration economic goods in large-scale societies.[8]

Socio-economics' strength, and one of its major contributions, has been to demonstrate how extensively this rationing system is affected by sociocultural ("non-economic") institutions and values. These include family and kinship patterns, ethnic

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[8] General economic rationing occurs in stages. Price rationing provides the presumptive first gross cut across all social-economic categories. From there, various social-distributive rationing mechanisms make their presence felt, such as asset ownership, social class, family structures, philanthropy, tax systems and governmental transfer payments, and others. Thus, it is clear that price rationing is only one part of a very comprehensive and complex societal distributive system.

loyalties, religious orientations, educational attainment, professional affiliation, gender levels, age cohorts, nationality, geographic region, shifting styles and fashions, among others. Prices are never as free of such social influences as implied by price theorists. The rationing of goods is directed into channels defined by a society's diverse institutions and values. Hence, one arrives at the concept of the social capsule that surrounds and profoundly conditions economic activity.[9]

SOCIAL CAPSULES AND PLANETARY ECOLOGIZING SYSTEMS

Societal capsules have a far more profound significance in economic life than even socio-economists understand. They are directly related to and are a partial expression of "ecologizing" processes, which is the second of the two planetary economic processes mentioned at the outset of this paper. Like economizing, ecologizing supports life but does so even more securely and for larger numbers than does economizing. The reasons for the greater life-sheltering properties of ecological networks are complex but boil down to the advantages that collectivities of diverse life forms display when compared to the relatively autarchic, self-contained life struggles of individuals.[10]

Important also for understanding social c apsules' wider significance is the somewhat peculiar but not widely understood relationship of economics and

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[9] The term and concept "social capsule" are Amitai Etzioni's (1988: Part III), although the general principle has a long history in socio-economic thought.

[10] For a fuller explanation, see Frederick (1995: Chapter 6, "Ecologizing Values and the Business Dilemma").

ecological processes. They are more alike than different, more reciprocally supportive than competitively opposed, and each is incapable of existing in the absence of the other. Once again a simple two-part rule-of-thumb principle is useful: First, all economic transactions (among all life forms) take place within an ecological context that conditions the outcome. Second, any ecological system (ecosystem) is composed almost entirely of economic transactions between life forms; that is what an ecosystem is---a set of interwoven economizing activities undertaken by diverse life forms (Eldredge and Grene, 1982).

In one sense, the sociocultural human communities, along with their institutions and values, that comprise social capsules are themselves a kind of ecological system that is subject to the same kinds of processes found in all biotic communities. Though enormously elaborated in form and content by untold generations of sociocultural evolution, human ecosystem communities display the core traits of most other natural collectivities: diversity (pluralism); close linkages of vital life forms and processes; multiple transactions among all life forms within the ecosystem; a strengthening of life opportunities and life prospects for community members generally; stable change over long time periods; and a vulnerability to shocks (either natural or sociocultural) originating outside an ecosystem's boundaries. This ecological foundation of human community means that many of the desired traits of community life---integration, cooperation, social bonds, loyalty, trust, etc.--- are "built-in" features; they do not need to be found or invented. But of course they need to be consciously cultivated, nourished, encouraged, promoted, tirelessly advocated, and

continuously renovated.[11]

Socio-economists have long argued that the economy is embedded in society, that economy and society co-evolve, that economic transactions are encapsulated within a network of social customs and institutions. It is time now to extend this perspective and to acknowledge that social capsules are themselves embedded in networks of natural forces. The interactions and feedbacks between these two systems---the sociocultural and the natural---establish the possibilities and define the limits within which human economic endeavors can proceed. So, the first rule-of-thumb---that economy exists within ecology---confirms not only the social embeddedness relationship but a further natural embedding of socio-economic activity.

However, the second rule-of-thumb is not strictly observed within human ecosystems; that is, societal capsules consist of far more than economic transactions alone, and much of this non-economic content either impedes or is irrelevant to (human) economic life. This trait of social capsules implies that human economizing will not attain the full potential of collective life-supporting activity that otherwise might be feasible. In "advanced" mass-consumption societies, for example, energy-wasteful, ecology-damaging products often diminish the society's long-term economic prospects by hastening entropic decline. In this and related ways, some types of economic enterprise might actually diminish the survival potentials of human

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[11] The activist stance of communitarianism is one of the features distinguishing it from socio-economics, as pointed out by Richard Coughlin (In press).

ecosystems. The Enlightenment model of market economics (idealized in the United States) could be one example; the command-and-control model of state economics (idealized in the former Soviet Union) could be another. The most probable way that these negative economizing effects would occur is through a disregard of possible damage done to vital, life-supporting ecological networks. Given the close nature-based linkages between economizing and ecologizing, injury to one process must harm the other. Hence, social capsules may well contain the seeds of their own destruction (O'Connor, 1994).

The socio-economic insistence on the importance of social collectivities, rather than individualistic stand-alone behavior, is only strengthened by recognizing their naturalistic derivation. The reason why the socio-economist's collective rationality outruns the market economist's individual rationality is because the pool of (nature-based, culturally-stimulated) human intelligence directed toward economizing means and ends can generate not only more alternatives but more thoughtful and varied ways of economic coping than any given individual however rational. Collective human intelligence is one of the great, indisputable selective advantages of our species. To deny that it can be brought to serve human economic purposes, or to serve them better than individual actions, as market economists frequently aver, displays a profound lack of understanding of the naturalistic forces at work.[12]

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[12] It also betrays a (perhaps fatal) commitment to an Enlightenment philosophy of freedom, liberty, and rights for individuals that works at cross-purposes with planetary economic processes. This story has been told best by Martin O'Connor (1994) and will not be detailed here, since the strong link between Enlightenment ideology and market economic theory is well known. What is not as well known is

Social capsules thus exhibit both strengths and weaknesses as arbiters of economic activities. They can and do harbor values and human practices that drive economizing efforts toward destructive ends, just as they simultaneously enable human economic behavior to achieve remarkable levels of well-being for remarkably large numbers of people in remarkably different kinds of human societies. Finding ways to economize within the possibilities and constraints of planetary economic processes remains the key challenge of all economic theory, including socio-economics.

THE NORMATIVE CHALLENGE

That challenge is, above all, a normative one that involves the construction of moral rules and socio-economic policies consistent with planetary economic processes. Such a daunting task will not be attempted here. It is fair to say, though, that many current notions about how to go about this normative task lack basic understanding of the natural forces involved. Current, popular initiatives to create "sustainable" economic policies fail to confront the inexorable, unavoidable effects of thermodynamic processes. The same is true of technological "fixes" and of the popular "recycling" programs. The entropic rule-of-thumb is very simple and direct: all economic effort produces greater waste than goods, more costs than benefits,

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that this close association not only contributes to the difficulties of reconciling market economics with planetary economic processes but tends to blind orthodox economists and citizens alike to the long-run catastrophic consequences of present, market-inspired economic practices.

more disorder than order. The goods, benefits, and order produced at one point result in the export of wastes, costs, and disorder to other points. There is no escaping this fundamental condition. It is the point at which socio-economic theory and the search for moral rules and policies should begin.

Martin O'Connor (1994: 172), struggling with "the lurking question of how we position ourselves," and fully aware of the hold of thermodynamics on human affairs, poses this question: "What exactly might a sense of proper relation be, towards others, towards Nature's life? If the ethos of the worker/consumer sovereign in the marketplace no longer gives a convincing answer, nor [i.e., neither] does the simple rhetoric of conservation. Conservation of what? At the expense of what? By resolution according to what criteria of antagonisms as they occur?"

At the moment, one cannot be sanguine about the answers to these questions given either by market economics or socio-economics, since the former has misunderstood (see Mirowski, 1990, for examples) and the latter has ignored (Etzioni, 1988) the role played by planetary economic processes. The important thing is to get our minds to deal with nature's fundamental forces and to quit pretending that they do not exert overriding influence on human economic affairs. Once that is done, one can then place both market economics and socio-economics within that context and judge each theory for the contributions it can make toward understanding and adjusting human economic activities to the natural and sociocultural world around us. Incorporating such perspectives into socio-economic theory would give socio-economists a powerful first principle of economic action: Human economizing

consists of nature-based planetary economic processes expressed through diversified, variegated sociocultural institutions.

The moral system and the economic policies that emerge will then need to generate and give practical expression to moral rules that are germane both to the lives of economizing individuals who find their way within a market context, and to people whose economic endeavors take place largely within social collectivities. The resulting normative rules and economic policies will represent a blending of morality, sociality, and nature.[13]

TOWARD NATURE-BASED ECONOMIC THEORY

A socio-economic project built on this paper's theoretical premises could draw upon the strengths of both market economics and socio-economics while avoiding some of the negative features of each. Such a formulation would exhibit the following traits:

* It would represent a positive theory-building approach, rather than a negative, contrarian critique of existing theory.

* It would include, not reject, selected market processes and institutions as vital components of planetary economic theory.

* It would include, not reject, social capsules as conditioners of human economic actions.

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[13] For one attempt to generate such a nature-based normative theory of business behavior, see Frederick (1995).

* It would provide a secure theoretical base for generating moral rules germane to the lives of economizing individuals and groups who face the opportunities and constraints of planetary economic forces.

* It would, one would hope, capture the attention and interest of key influencers in both private and public life, whose attitudes, decisions, and policies count for so much in the life of our planet.

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