



What makes the social sciences in general and economics in particular so dismal? Nicholas Georgescu-Roegen states explicitly in *The Entropy Law and the Economic Process* (Cambridge: Harvard University Press, 1971) that he sees the economic process as an entropic process. He talks about the struggle for low entropy. He even talks about evolution. But, in this scientific framework, the best we can achieve is merely to hang on a little longer amidst scarcity and conflict.

The incumbent establishment is imbued with expediency and cosmic cynicism. Most members of the establishment are busy men. They can't afford to sit around for millions of years while the universe degenerates by degrees. The suspense is killing them. Men of action yearn to "go in there with everything we've got and get it over with!"

Naturally, many boys and girls are reluctant to follow such leaders as these. Something there is that does not like to be part of a great death machine. More than a few young men, headed for careers in science or engineering, have pondered the laws of thermodynamics and subsequently have dropped out, flipped out and freaked out. Allen Ginsberg said in his poem *Howl* that he saw the best minds of his generation destroyed by madness, starving, hysterical, naked, dragging themselves through the Negro streets at dawn looking for an angry fix . . .

The Dynamic Equilibrium Theory

Fortunately, however, the doctrine of ultimate futility is finally being refuted on scientific grounds.

The physicist Niels Bohr observed quite early in this century that natural processes do not have a single direction. On the contrary, he found that tendencies of one sort were generally balanced by tendencies of an opposite sort. This observation has come to be known as "the principle of complementarity."

Thus, in the fields of information theory, cybernetics and general systems science, scientists have observed that the tendency towards *entropy* is balanced by a very significant countervailing tendency which might be called *syntropy*.

Pierre Teilhard de Chardin argued thirty years ago that, although scientists were preoccupied in their analytical research with the dissipation of energy and the disintegration of matter, they were being called upon by biology to perceive that, "parallel with the phenomenon of corpuscular disintegration, the Universe historically displays a second process as generalized and fundamental as the first: I mean that of the gradual concentration of its physico-chemical elements in nuclei of increasing complexity, each succeeding stage of material concentration being accompanied by a more advanced form of spontaneity and spiritual energy."*

The outflowing flood of entropy, energy, explosion, death and disorganization is equaled and offset by the incoming tide of syntropy, synergy, implosion, life and increasing organization. Teilhard referred to the synergistic phase of the universe as "Noogenesis" because he felt the evolution of mind, spirit or consciousness was its most significant feature. He traced noogenesis from the formation of basic chemical elements right on through to the emergence of "the phenomenon of man" and beyond.

The universe as a whole is not degenerating. Although the observable galaxies appear to be accelerating away from us in an explosive manner, it should be obvious that some of the radiation from these galaxies is converging back to us in an implosive manner. Otherwise, their light would not reach our eyes, and we would be unable to see them. As galaxies move away, they leave behind enough stuff to replace themselves. This process maintains the universe in dynamic equilibrium.

The true "atoms" of universe are the fundamental quanta of action described by Buckminster Fuller as being tetrahedral in structure. These quanta of action, the basic stuff of the universe, are being continually recycled—they come together in happenings called "matter" and then spread out again as "radiation." The ancient Greek word "synergy" refers to the dissipation or going apart of action. Thus, action is neither created nor destroyed; it merely comes and goes according to various rhythms and patterns which we are only beginning to understand.

Hydrogen clouds are forming constantly in intergalactic space, gathering and organizing the action which comes to them in the form of radiation. When these hydrogen clouds condense as stars and achieve internal temperatures of about five million degrees, the occurrence of helium becomes highly probable. The fusion of hydrogen into helium accelerates the process of implosion and increases further the internal pressures and temperatures of stars. At temperatures of one hundred million degrees or more, helium is converted into carbon. In this way, all the basic chemical elements are synthesized in stellar fusion reactors.

Scientists are beginning to develop reasonably satisfactory theoretical models of the syntropic processes whereby galaxies and the stars within them convert the random stuff of the universe into orderly chemical elements, but mainly they are discovering the extent of their own ignorance. In their preoccupation with radiant phenomena, which put on a great show, astronomers have been able to account for only a hun-