

Why are we in the Universe?

by Don Benson

Humanity is just now transcending a series of localized struggles for survival. Our minds are no longer locked into traditional patterns. We have to find a new purpose for living beyond the immediate insanities of this world.

The Big Bang Theory

One of the principal insanities we have to overcome is the Western belief that humanity has no future.

Western Civilization was created by men who went against the prevailing winds on this planet; its traditional *modus operandi* has been the conquest of nature. Western science, the supreme accomplishment of this tradition, has attempted to delineate and describe the universe as a gigantic machine. During the last few centuries, Westerners have exulted in learning how to manipulate this machine for fun, profit and the greater glory of this or that.

But, in the process, we have discovered that machines tend to run out of steam. No one has been able to build a perpetual motion machine. Every system studied by Western scientists has been found to be losing energy. Machines require inputs of fuel to keep going, and only part of the fuel can be transformed into work. Some energy inevitably escapes as heat. This process of energy loss is known scientifically as "increasing entropy," a term invented in 1865 by the German physicist Clausius.

In typically authoritarian fashion, Western scientists wrote a law—the Second Law of Thermodynamics, alias the Law of Entropy—which says that energy must escape from machines. It was assumed that, in obedience to this law, the whole universe was moving towards inexorable death. The book entitled *Energy* in the popular Life Science Library (Time, Inc., New York, 1963) includes such gloomy section headings as "Heat, the Inevitable Tax on Usefulness," "Nature's Obstinate Progress Down a One-Way Street," and "Entropy: Death Knell for the Universe." In this way, untold thousands of school children have been indoctrinated with the utterly demoralizing view that life is essentially futile.

Children are taught at an early age that the sun will burn up eventually and go out. They are taught that the earth might be destroyed totally at any moment by nuclear explosions, that human life might be eliminated quickly in biochemical warfare or slowly in industrial wastes, that the fuels which modern societies require are fast diminishing, and that in general "progress" has led to one disaster after another.

The prevailing theory of universe in the West is cheerily called "the Big Bang Theory." In 1920, the astronomer W.M. Slipher advanced a theory that the galaxies are retreating from us at rates which increase in proportion to their distances from us. He advanced this theory to explain the so-called "red shift" phenomenon: certain red lines in the spectra of light from other galaxies

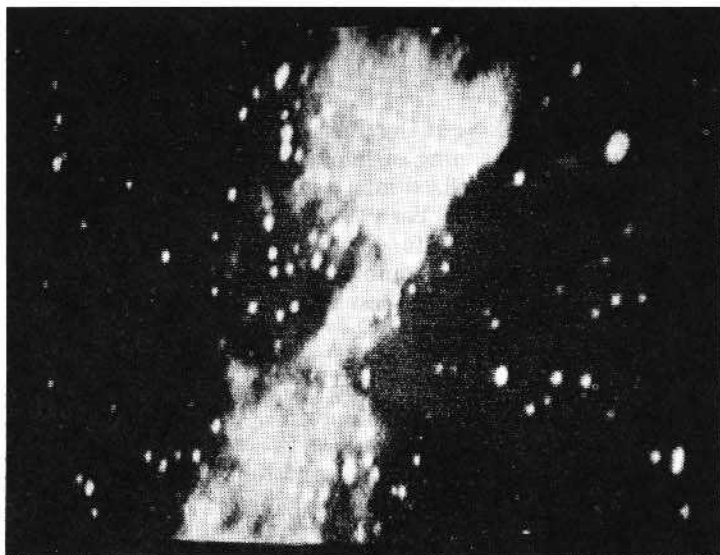
deviate from their expected positions by a factor which correlates with distance. Following the work of Slipher and others, scientists have presumed that galactic dispersion is occurring as just another manifestation of the general dispersion of the universe. According to the Big Bang Theory, the universe began with a "big bang" some billions of years ago, and it is gradually degenerating to a condition so miserable that it will be incapable of even a "little whimper."

In the spring semester of 1964, I attended a class on "the History of Western Civilization" at Amherst College in which the professor made the following parenthetical comment about revolutionary movements and all other efforts to improve the human condition: "But you realize of course that all these efforts are ultimately futile. We really shouldn't take them seriously because according to the Second Law of Thermodynamics there is absolutely no chance of even preserving human society much less improving it. The universe is gradually reducing to a sort of luke warm energy bath, and the possibility of human life is reducing with it."

After class, when I confronted the professor with some questions about the validity of his assumption, he attempted to dismiss me by saying, "Don't worry about it. The universe won't run down completely for a long, long time. This is nothing to lose sleep over." "But the nature of the universe and man's role in it is something which concerns me very deeply," I replied. "On occasion I have stayed awake all night thinking about these questions." "Well, then," said the professor, "why don't you go join the Peace Corps!"

More recently, I encountered a book by Angrist and Hepler entitled *Order and Chaos, Laws of Energy and Entropy* (Basic Books, New York, 1967) which attempts to make thermodynamics palatable to the general reader by means of humor and other literary devices. Since the book was written in a frame of mind oriented towards the death of the universe, it is laced with a kind of gallows humor, and even the most positive statements are exceedingly grim. The authors indicate, for example, that life should be regarded as just some inexplicable quirk with negligible significance for the overall process of universal degeneration. Medicines which help sick people to recover have a negative value in the overall scheme of things; whereas, poisons are to be regarded as positive catalysts which speed the inevitable processes of death and decay.

Western science has undermined all the old values, imperatives and truths. Contemporary man has been provided with two excellent rationalizations for doing whatever happens to suit his whims: (1) moral principles aren't sacred; every culture has a different conception of right and wrong; (2) what the hell, we're all doomed anyway.



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 work "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-

dredth to a tenth of the action that Einstein's theories predict is in the universe. At the annual meeting of the American Association for the Advancement of Science in 1967, there was a formal acknowledgment by Princeton University physicist John A. Wheeler that the universe may contain billions of "black bodies" which are invisible because they operate implosively rather than explosively.

Indeed, to achieve a balanced account of the universe, we shall have to pay much more attention to syntropy. This will be difficult because syntropy is essentially invisible. Ordinarily, a healthy forest which is syntropically impounding energy through photosynthesis attracts much less attention than a forest fire which is entropically devastating many acres of timber land. Heretofore, scientists have been trying to chart all the forest fires in the universe, but they have scarcely acknowledged the existence of growing trees.

The Big Bang Theory, in other words, is a bust. Granted that on a clear night one can see evidence of explosions all across the sky, one is still faced with the problem on a sober morning of explaining how all those fires are fueled.

In general, it seems that massive or very dense systems spin outward away from the center of the universe (or at least our region of it) while stardust, radiation and loose quanta of action gravitate inward towards the center. As action collects towards the center, it is impounded in massive systems which accelerate away from the center as they become increasingly compact. As systems become increasingly compact, they become increasingly explosive; so that, when a system is as far out and dense as it can possibly be, it explodes completely and returns piecemeal towards the center. (It may be that the interaction between "Matter" and "antimatter" plays a critical role in the maintenance of dynamic equilibrium.)

We do not yet have a cogent, empirically-based mathematical model to go with the dynamic equilibrium theory of the universe, so that the testing of alternative hypotheses is very difficult. But we have ample evidence that humanity does belong in the universe. We are not merely a quirk. We are not fundamentally doomed. Indeed, we have every reason to proceed with con-

fidence that the universe contains many healthy forests, and so long as we can maintain a symbiotic relationship with one or more of these forests we shall survive and prosper.

Old Worlds and New: Our Purpose for Living

The ultimate meaning of human existence—the greedy imperialism of civilized man as well as the hunting and food gathering of early *homo sapiens*—begins to emerge. Our purpose for living is to synthesize the stuff of the universe into complex and orderly forms. Our synergetic functioning (best expressed in the magnificent human capability for communication and comprehension) countervails against the energetic forces of explosion and disorganization to help maintain the dynamic equilibrium of the universe.

We may regard ourselves as important catalytic agents in the development of planets. With our global trade and communications networks, with an integrated global energy grid soon to be established, we are in the process of transforming old Mother Earth into a vast organism, more beautiful and intelligent than we can imagine.

Our evolutionary potential is twofold: we are destined to merge with this planet and bring it to fruition, and we are destined to leave this planet and fulfill our synergetic lust for new worlds.

Some of us will stay behind. Some of us will go.

Part of us wishes to develop Earth as an ongoing work of art. Part of us wishes to get away—assuming new forms, learning new skills and working with new media on other planets in this solar system and beyond.

Each of us has a unique role to play against the backdrop of universe. But, as we move in different directions, we are all bound together by our common involvement in the great syntropy.

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**The Future of Man*, Harper & Row, New York, 1964, page 78.

