



On the Subject of
Strategic Method



COGNITION *VS.* INFORMATION
IN SCIENCE

How Ideas Change The Order of Space-Time

by Dino de Paoli

Sometimes, we become stupid just because we are too greedy!

Let me start by showing you the headlines of this Wednesday's *Die Welt*: "Europe Must Become World Internet Center"; and, at the same time: "The Defense Minister Will Eliminate 100,000 People from the Army."

This is just one example, among many, of the crazy utopia running our present world. I can give you another personal example of this paradox. I travel often by train from Hanover to Wiesbaden, with a change-over in Frankfurt. The greatest innovation of the railroad company is, that I can now reserve my train ticket through the Internet. I save some minutes compared to previous procedures. But, then, once at the station, the train, if it arrives at all, presently has an average delay of 15 minutes, and I must always urgently call my friend in Wiesbaden to pick me up at the station one hour later! The 15-minute delay of my train is enough to make me miss the computer-programmed change in Frankfurt.

This is life in Cyberland!

More seriously, the issue is that so-called investments in "electronic consumer service" are not an *added* service for the consumer, but, in reality, only an *alternative* to the needed investment in the physical aspect of that same service, with obvious catastrophic consequences. Such a state

of affairs is in large part the result of the ideology which, in its recent form, started to be fully applied in 1970 under the name of Malthusian de-industrialized society. Some of the worst consequences of this policy are today visible in Africa, but now I want to show only how this affected the U.S.A. itself, precisely starting from the 1970's [SEE Figures 1-4].

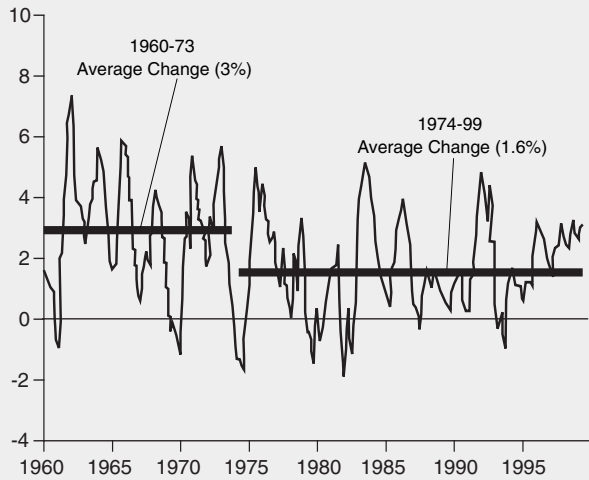
These are official American government figures; our own would be much more dramatic. Moreover, keep in mind that in the U.S.A., the effects of de-industrialization were softened by the fact that America tried to preserve its role as a superpower. Europe has nothing to help soften the fall: Once in the full swing of the Internet utopia, there will be only a quick road to disaster.

But, how can we say this? How can we speak of disaster, when a lot of people think they are making easy money as never before? How can so many happy people, be wrong in their expectation? To answer this, we need to get at the core of the information, or post-industrial, society.

The political projects for a "stable," de-industrialized global village, implemented as we saw from the 1970's on, had already been elaborated in England and the U.S.A. during and soon after the World War II, under the exotic rubric of cybernetics. We have written extensively on the history of this project, so I do not want to enter into any detail here. If one wants to grasp immediately the evil social dimension of cybernetics, it is enough to read one of the books of its main spokesmen: Norbert Wiener's *The Human Use of Human*

This article is edited from the written text of Mr. de Paoli's presentation. Footnotes have been added.

FIGURE 1. Percentage change of U.S. labor productivity, from previous year (1974 turning point).



Source: Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2001-2010*.

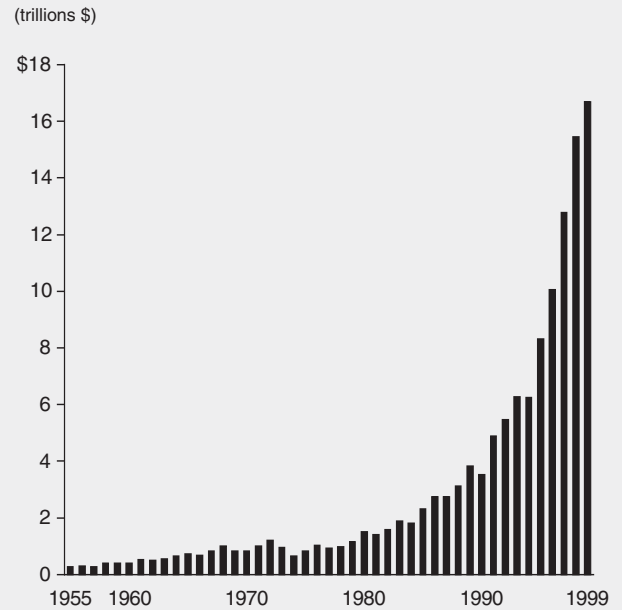
Beings. My colleague Ralf Schauerhammer has covered it in recent **EIR** reports.¹ How cybernetics developed the idea of “mass psychology” for the “shaping of opinions,” has also been documented in some recent issues of **EIR**.²

What Cybernetics Leaves Out of Account

This said, many people, especially in the academic world, have difficulty seeing that Wiener’s immorality is also much greater than his stupidity—stupidity which, in combination with immorality, leads them to make a fundamental mistake regarding the issue of natural law. It is only the discovery of this mistake, that can allow us to speak with competence about the doom of any society that adopts cybernetic zero-growth policies for long enough periods, no matter how happy the people sharing such an adventure seem to be. To get at this “mistake,” it will be necessary to struggle a bit with the core of the axiomatic structure of cybernetics and of the post-industrial utopia; which means also, essentially, to struggle with the work of Lyndon LaRouche, who first, already in the 1950’s, specified it, and elaborated a crucial insight for its solution. Cybernetics’ mistaken assumptions can be reduced to two axioms:

(1) The concept of “progress through discovery” is only a sophist’s nominal definition, without any corresponding “objective” reality in the universe. I call this

FIGURE 2. Capitalization value of all stocks traded on U.S. stock market 1955-99.



Source: Federal Reserve Board of Governors, “Flow of Funds Accounts.”

first, the “Adam Smith/Darwin Axiom.”

(2) Social policies should not be oriented to guaranteeing our future by fostering human creative potential and the dominion of *man over nature*; but instead, by the increase of hidden social control, and by fostering the dominion of *man over man*. I call this second, the “Malthus Axiom.”

To better see how wrong these two axioms are, we need to go through such abstract concepts as: *entropy*, cybernetic *negentropy*, and the alternative LaRouchean *anti-entropy*.

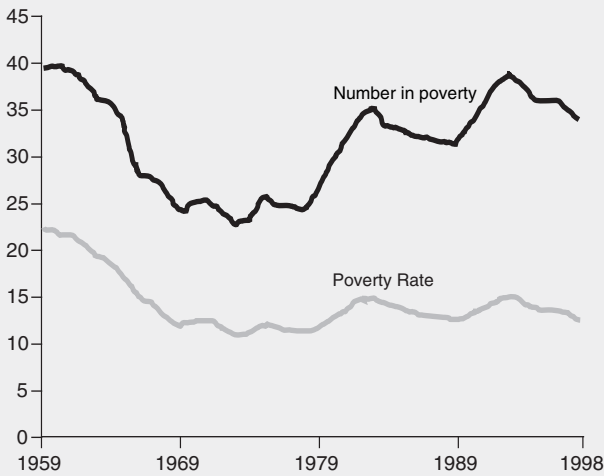
The Real World

Let me start with few words on what entropy is.³ For Leibniz, and especially for Lazare Carnot, entropy meant a form of physical “impossibility,” or a form of “relative-absolute limit” which we encounter in the material transformation of our world. Such impossibilities, or limits, very often take the shape of dramatic catastrophes threatening the existence of entire societies, if they are not solved.

Any technological horizon, and indirectly, any discovery or theory behind such technologies, has an intrinsic limitation in time and space, which appears sooner or lat-

FIGURE 3. *Number of poor and poverty rate in U.S.A. (1974 point of increase).*

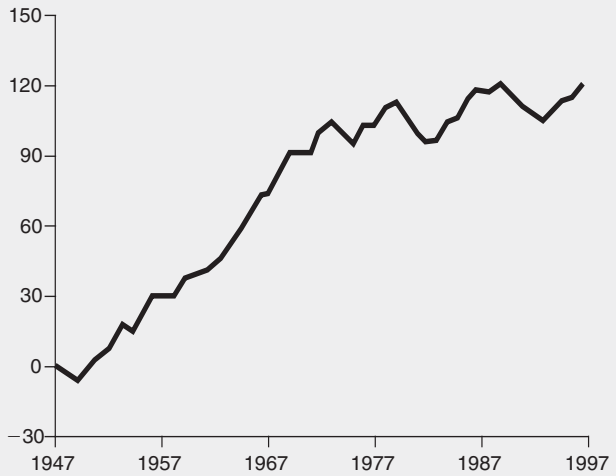
(numbers in millions, rates in percent)



Source: U.S. Census Bureau, *Poverty in the United States 1998*.

FIGURE 4. *Growth of real median U.S. family income (slowdown since 1970).*

(percent change since 1947)



Source: U.S. Census Bureau, *Poverty in the United States 1998*.

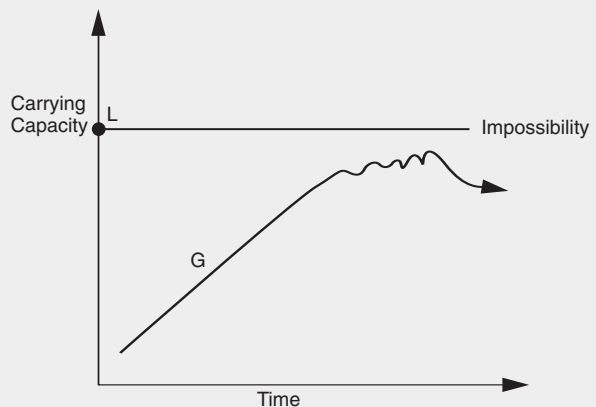
er as an unavoidable contradiction in the theory, as well as an unstoppable reduction in physical, social productivity. It is the reduction of social productivity which, if not reversed, brings ever more members of a society below the threshold required for biological survival—e.g., famine, incurable epidemics, etc.

Let me illustrate Carnot’s idea with a graphic [SEE Figure 5]. Here the line (*L*) represents a calculable socioecological limit, defined by the rate of reproduction possible under that form of energy, or motive power, or technological horizon. For any process of expansion or growth (curve *G*) inside that space, not only is it impossible to get above that limit, but in reality, with *time*, its *simple expansion* will tend to be less and less efficient, and so it will decline.

In other words, entropy is a real problem in the physical world, and this is why I defined it as an absolute limit. It appears in this form to any society, based on a given, fixed, energy source or motive power. At the same time, I defined it as relative, because we, and actually the world, seem to have a way to overcome such limits. But—and here is the crucial point—this can be done only in one single and *necessary* way: Discover or create a “higher” form of energy-space, or motive powers. This, and only this, transforms the previous contradiction and impossibility in simple anomalies, and solves it. “Higher,” here, has a precise and calculable meaning, but I do not need to go into the details.

All this gives fully intelligible meaning to our affirmation that “real evolution,” or “progress through discovery of new universal laws of nature,” is a necessary condition for preserving existence. Also, the fact that we continue to exist by the creative use of our subjective mind, gives an objective reality to our subjectivity. Only this process—which finds, faces, and solves such “impossibilities”—is to be defined as *anti-entropy*. Whether this is a general, or local, property of our universe, is not a matter

FIGURE 5. *Carnot’s conception of how entropy places a limit on growth in productivity.*

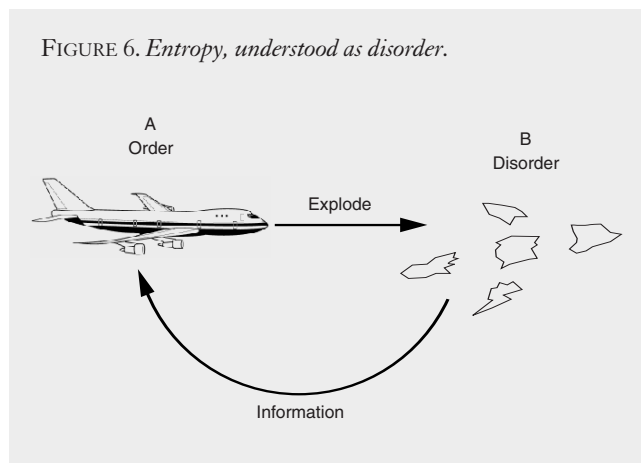


of our concern for the moment. We know for sure, that without that process, there would be no real existence for a human society. Animal society seems to have it easier. Animals exist without the effort of cognition. Life does the anti-entropic work for the single animal species; but, for that reason, they also tend to disappear, very often, as single species.

The Cybernetic World

In the later part of the Nineteenth century, the concept of entropy became more and more transformed into probabilistic mathematics, and associated with notions such as disorder, randomness, and time; alternatively, *negentropy* became associated with time-reversal, order, structure, and information.

I will try to make these associations clear, with the following illustration [SEE Figure 6]. Imagine an airplane (a structure obtained through work). It explodes into many disordered pieces; this is a form of strong increase of entropy. The pieces move randomly, and we lose all meaningful “information.” But, with the patient work of the F.B.I., sometimes we are able to re-acquire the information, that is *piece the airplane back together*, and explain the event of the explosion. Something like this capacity to re-acquire meaningful information, is sometimes called negative entropy, or negentropy. I do not want to banalize the work of piecing together exploded airplanes, nor the fact that the link between information and entropy was first developed in connection with real physical problems encountered during transmissions by telegraph. Neither do I underestimate the usefulness of the development of “filters” that are able to reduce the “entropy” of distortions, disturbances, and noise from waves, so that, today, we are able to see satellite images, when, under normal condi-



tions, we would not see anything. My point here, is that such means to overcome “ignorance,” or loss of information, such methods of “learning” as expressed by cybernetics, can surely be very useful, but they are very insufficient to arrive at the universal meaning of the *docta ignorantia* of Nicolaus of Cusa, or the “I know that I do not know” of Socrates. Moreover, the real evil starts, when someone starts to say that human society has no need to produce enduring evolution through real cognitive discoveries, and can, instead, be satisfied which such so-called negentropic “learning” activities. And this is the cybernetics project, which I want now to better illustrate.

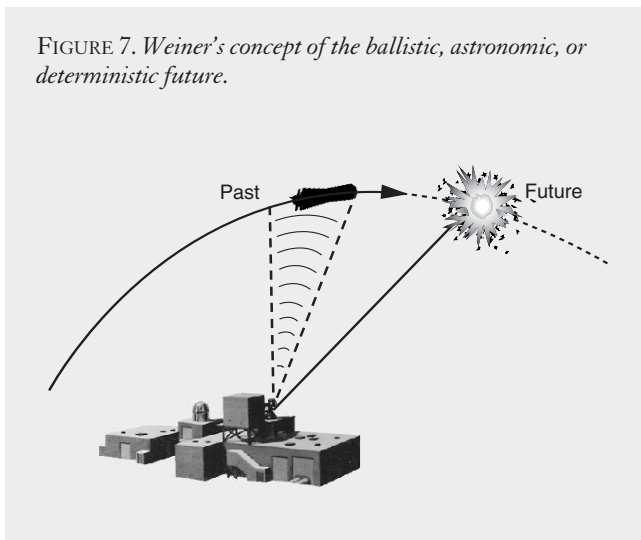
We have to go into issues of *time* and the *future*.

Wiener, during World War II, helped the British to develop models for radar and self-targetting shooting devices. The principle of Wiener’s work can be shown with two illustrations.

Figure 7 is what I will call the ballistic, astronomic, or deterministic future. We have a missile, with a fixed space trajectory. It is captured on radar, and, with the information we have, we can deduce from its *past* path, a projected *future* path. Such acquired and deduced information will help a shooting device to self-target its shots, and hit the missile. All this can, in principle, be automated, given its deductive structure. This is essentially the first of Wiener’s ideas, and is also essentially the useful thermostat installed in your house. You can see that in this first example, time (except under the concept of speed) plays no real role in the calculation. If the full event were to take place one day later, it would not make any major difference in how to calculate the path.

Let’s now look at a second level, which I will call the “risky” prediction of the future; or, the time-path [SEE Figure 8]. In this second example, instead of the missile with a fixed orbit, we have now an airplane guided by a pilot. It is obvious that the automatic acquisition of information and adjustment of the shooting becomes more complicated. The presence of the pilot in the system introduces an independent degree of freedom: the pilot can make decisions. He could suddenly change the path, when and however he wants. Moreover, the pilot will react to the radar, which, in turn, will react to the pilot, which in turn, etc., etc. This interrelation is a typical so-called “non-linear event,” so very fashionable today. But does the pilot really have that much freedom? No, not so much, says Wiener. If one knows the constraints of the physical geometry in which he moves, then one knows that, given the high speed, the physical effects of acceleration and deceleration, the *time*-dependent process of any

FIGURE 7. *Weiner's concept of the ballistic, astronomic, or deterministic future.*



decision-making, etc., the pilot actually has only a limited *set* of possible maneuvers, and can be shot down by an automatic self-targeting device operating with a certain amount of *probability*.

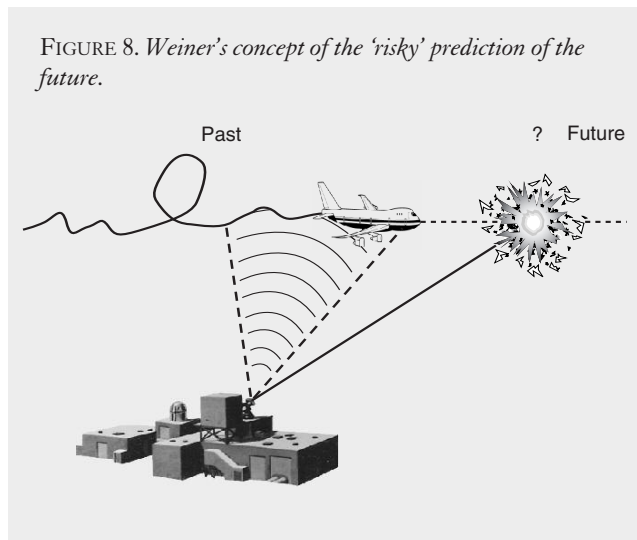
It is the more or less successful attempt to automate the calculation for such non-linear probabilistic systems, which makes the bulk of the cybernetics work. And, it is also this, that, at the same time, makes cybernetics useful to the oligarchical utopians. If human societies can be induced to act as “non-linear” systems, then they, too, can be put under automatic control procedures, non-linear self-adjustments, global planning, etc. Such non-linearities are only in appearance complicated, and only in appearance give the *impression* of freedom. Indeed human behavior, when acting *only* inside a real or artificial set of physical or psychological constraints, without being able to change its geometry, is as predictable as an irregularly shaped billiard ball! Only real cognitive creativity, in the form of the *anti-entropy* that we analyzed before, escapes the trap of determinable probabilistic behaviors.

Through the help of “mass psychology” and a set of policies, a society could indeed be reduced to act in this virtually non-linear way, and be calculable by cybernetics procedures; but to do that, one has precisely to destroy the efficient use of that cognitive creativity, which is the only means that society has to guarantee its survival in the real world.

But before going into this, let me give another example to clarify this issue of non-linearity and time.

Some time ago, I wanted to go from Hanover to Milan. Out of curiosity, I went to the German automobile club ADAC, to get advice about the best road to take. I asked the new, young employee, who looked at

FIGURE 8. *Weiner's concept of the 'risky' prediction of the future.*

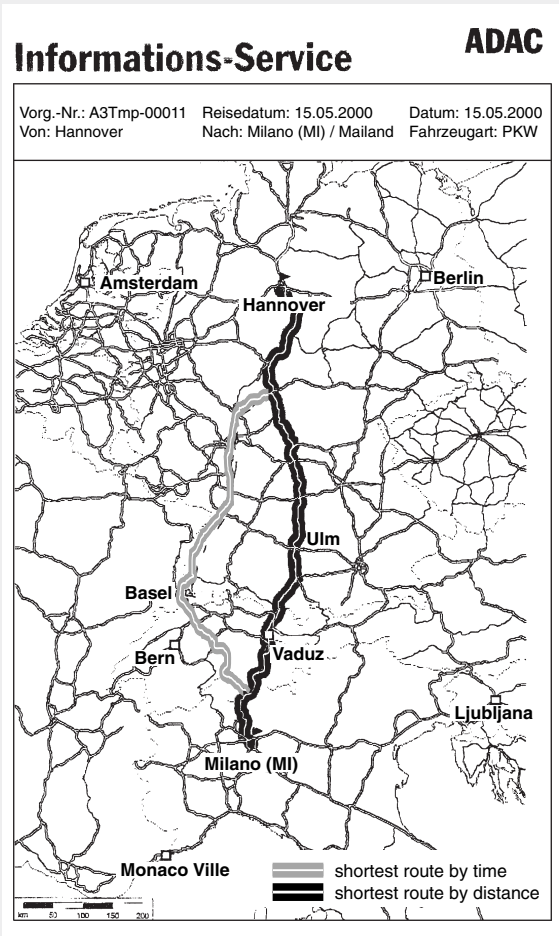


me and said, “Milan! Where is that?” I told him to go to his computer and simply ask for the Hanover-Milan route. And indeed, he came back, smiling, without having learned where Milan was, but with the following printout [SEE Figure 9]. Here you see the best Hanover-Milan route indicated by the computer. It goes from Hanover to Wurzburg, Ulm, Boden-see, the San Bernardino Pass to Milan. Now, this is indeed the shortest *path*, in terms of space, but not in terms of *time!* The shortest time is usually achieved by going through *Basel* (I have added this route to the map.) How did the computer make such a mistake? Or, is it really a mistake?

How do I know that the Basel route is the shortest time? Only statistically! *Usually* that route is shorter, because there is only one border to cross (taking the Ulm route, one has to enter Austria and Switzerland), because the route is highway all the way, etc. But this situation can change from one day to another, from one hour to another, from one minute to another. You can have sudden accidents, traffic jams, etc. In short: *Time-based events* are very difficult to pre-calculate *a priori!* The introduction of time, brings with it probabilities, statistically learning from past, non-linear interactions, etc.—in other words, a lot of what cybernetics defines as *entropy*. To overcome such entropic unpredictability or ignorance, one has to introduce nothing other than a *constant flow of information*, says cybernetics.

And promptly, the information industry is there, ready to sell you systems which update you on the traffic situation every ten minutes. Or even a satellite guidance system, with a real-time route planner to be installed directly in your car, which will guide you, and even will talk to you, to calm you down when you nevertheless face

FIGURE 9. Computer-generated map of Hanover-Milan route. The computer “best route” gives the shortest path in terms of space, but not in terms of time.



the unpredicted traffic jam!

Now you know why most people get fascinated with cyberspace! Very soon all of us will go around with antennas to get constant updates on world *time-events*, and so, be informed and happy. The most popular sport in Germany is to quickly get the news to outsmart all the other drivers, in attempting to bypass the growing daily intensity of traffic jams. Nobody asks himself any more, why, in fact, there is such increasing breakdown in the traffic. Nobody asks himself any more, how to eventually *change the physical space* of the system to solve the problem!

I hope you see now, how wrong it would be to try to run the world simply by making a universal time-based route-planner. This modern fascination with time *per se*, these so-called increased needs for quick-response capa-

bility based on real-time information, is a fantasy, which forgets a bit too quickly the role of the left-out, unchanged “space.” The negentropy of cybernetics always assumes precisely that the characteristic of the physical space-time stays *unchanged*, and so, the so-called freedom of the “non-linear” creative behavior becomes a farce. This is why now, as never before, politicians use words like “creativity,” “innovation,” “knowledge-based society,” blah, blah, blah. Meanwhile, now, there is more *devolution* in the physical base of our society, than ever before. In the last thirty years, we have reduced our nuclear energy capability; we have sabotaged fusion energy; we have stopped real progress in space exploration; in sub-atomic physics; etc. The only exception seems to have been in biology. There, they now want to make money, as LaRouche says, with the patenting of our genome! But, there, too, we know that the absolute limit, in terms of motive power, for all biological life is represented by the sun. Biology will disappear with the disappearance of the sun! So, what is the sense of biological progress, unless we also face the fundamental issues of its physical condition of existence? Unless we start now to see how to re-create or repair the suns in our galaxy!

As I tried to express in a different way: Except in the utopia of the oligarchies, no society has the freedom *not* to respect the fundamental geometrical characteristic of our world, without suffering the consequences. It is precisely the recognition of such catastrophes, which indicates the path to the necessary change in our way of piloting the airplane. And, once in a while, we have even to change the type of flying!

This said, we shall now try to see how to get at the *higher ordering*, which defines the changes in the physical spaces, which cybernetics wanted to prevent.

As indicated before, cybernetics’ other axiom was that, even if real creative cognition should exist, there is no way it could be helped to become a reliable instrument to guarantee our future. It would be, at best, a purely mysterious invisible order, occult, unintelligible for practical needs. This is the Kantian element in cybernetics theory, which LaRouche has attacked frequently.

Paradoxically, no matter how much they have their big talk about communications, they are missing the way the universe really communicates with us. If you have read Leibniz’s *Monadology*, you probably have wondered, as I have, what Leibniz really meant, when he said that the *monads* have no windows, and cannot communicate *directly* among one another! Sometimes I think I understand it, because I feel the need to close down all my antennae, to avoid being overwhelmed by



FIGURE 10.
Pieter Bruegel
the Elder, "The
Fall of Icarus,"
c. 1555-1558.

information! But, probably, Leibniz meant something else: Indeed, he indicated that the monads can communicate among themselves, but only through the intermediate of a higher order, and a higher monad, reason, and God.

The universe does hold dialogue with us, and to do it, indeed, it has to use an *ordering* principle, a harmony. Order, then, is very relevant, but not in the sense of cybernetics. If you want to make a good joke, you cannot start at the end! Why? Because the visible order in an artistic composition, or in a joke, has a necessity, an aim: It does not inform you about its structure, it provokes you to get to the unseen higher order. Without that, at best, you only see a mere contradiction.

Let me try to show it with an actual joke, which I stole, because I find it very pedagogical:

A man arrives in Hanover for the Expo and goes to a nice, small hotel in the countryside. He enters, asks the relaxed half-asleep owner for the keys, and starts to go upstairs. But, there, an aggressive-looking dog faces him. Frightened, he takes a step back and asks the hotel owner, "Does— does your dog bite?" The half-asleep hotel owner answers, "No, it does not bite." The guest goes up, and, promptly, the dog bites him. Furious, he rushes back to the half-asleep hotel owner and screams, "You liar! You told me that your dog does not bite, instead—" And the hotel owner, calmly, and now

awake, replies, "But, that is not my dog!"

Why is this joke pedagogical, although very simple? Because its order shows clearly the arrival of a contradiction, and its transformation in an ambiguity. Ambiguity, at which you laugh, as soon as you "get" that the change in geometry solves the paradox. Or, you would laugh, if I were able to tell good jokes.

Given that I am bad at jokes, let me try another angle: Let's look at a famous painting by Pieter Bruegel, "The Fall of Icarus" [SEE Figure 10].

The reason I got interested in this painting will become obvious. Icarus, as you know, was the son of the scientist Daedalus, who, some two thousand years ago, had to escape from his country. The enemy was waiting along all the probable and improbable paths they could calculate, to shoot him down (under the advice of N. Wiener). But Daedalus invented an "impossible" new path—he invented how to fly, and escaped. But, he had to take his son, Icarus, with him. He carefully instructed Icarus about the constraints of the system: The wings would melt if he went too near the sun. They start their flight, and everything functions; but, after awhile, Icarus, who thinks he is a creative whiz-kid, forgets the constraints, flies too high, the wings melt, and he falls. Many books and articles have been written (including a disgusting piece by Bertrand Russell) to say that Icarus is the symbol of the arrogance of

science. But Bruegel had a different view: Look at the painting. *Where is Icarus?*

We see that Icarus is represented only by a pair of legs coming out of the seawater! That is all! But now look at the farmers: They seem absolutely unaffected by the *events!* They go on working. Not only that, but now comes the *contradiction.* This farmer is looking in the *opposite direction* from where Icarus fell! He is looking up to the sky! So, then, what is the real theme of the painting? Is it Icarus's fall, or something else?

I guess you've gotten it by now: The real theme is the still-flying *Daedalus*, the real scientist.

Daedalus is so much the real theme, that someone made a copy of the painting and thought to literally paint him in. It is obvious that the copyist had no sense of humor, and of metaphor.

This is the same method of composition as the joke above. First, the recognition of a contradiction in the simple visible order, then its transformation in a paradoxical ambiguity as soon the higher order is grasped, by changing the geometry, the space. That process, that provocation, is the only real meaning and *information* of the painting.

This use of ambiguities and humor in artistic composition is very old. Take an example from 30,000 years ago, the Man-Lion from the cave of Hohlenstein-Stadel, near Ulm [SEE Figure 11]. We do not consider here the specific use of this very old art object. The issue here is, that the artist willfully uses an ambiguous concept, man-animal, to transmit an idea of invisible order: a man with an animal's face. And this is not because they could not represent humans' or animals' faces.

To Conclude

Indeed, life and existence is teamwork, not an isolated adventure. At the end of it all, we will get the medal, not if we have been the first in the class, but only if we contributed to bringing the full classroom to safety. But the only effi-

cient way to do it, is to communicate, using the type of "jokes" able to evoke the resources that, to varying degrees, are within each one of us. You see, a few chimpanzees can transmit some cultural acquisitions to the next generation, but there, it is done only by the mother, who shows the technique to her own offspring. In our human world, simple biological mothers are not enough to communicate. To survive, we need also the Socrateses and the Bruegels of the past, the present, and of the possible future.

Now, we can also answer Wiener's question about, where is the *assurance* that creativity can be activated when one needs it?

LaRouche, who, you know, is an unchangeable optimist, having probably in mind the Bruegel painting, once wrote:

However, as the greatest Classical tragedians have done, we are capable of rising above the grip of a fixed set of axiomatic assumptions, if we but first recognize them to exist in that way. We then foresee the tragedy which must unfold from adhering to such follies. Aha! But, to see this, is to prompt the will to free ourselves from it! That is true long-range forecasting in economics, in cost accounting, and anything else which the cognitive powers of the individual mind care to see.⁴

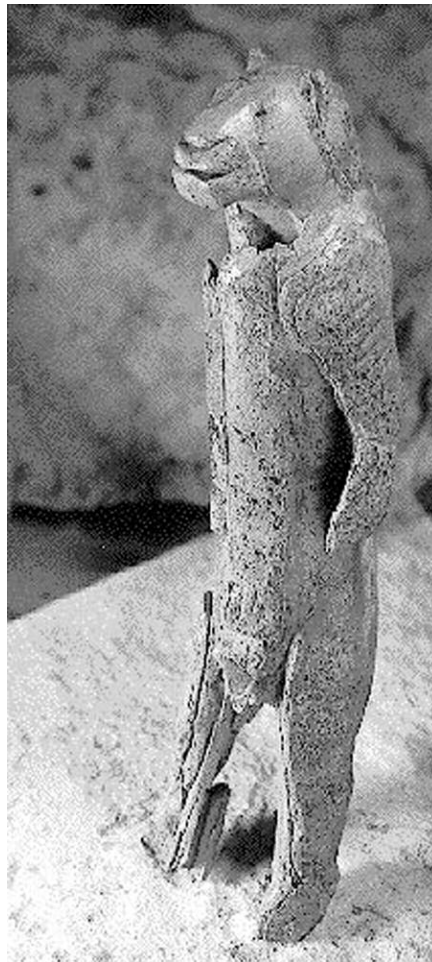


FIGURE 11. *Man-Lion sculpture, c. 28,000 B.C., cave of Hohlenstein-Stadel, near Ulm, Germany. The use of ambiguities and humor in artistic composition is very old.*

NOTES

1. Ralf Schauerhammer, "Norbert Wiener: Cybernetics and Social Control in Cyberspace," in *EIR Special Report: Why the New Economy Is Doomed*, June 2000 (Washington, D.C.: Executive Intelligence Review, 2000).
2. Lyndon H. LaRouche, Jr., "The Crash of the Nasdaq: Information Society, A Doomed Empire of Evil," *Executive Intelligence Review*, April 28, 2000 (Vol. 27, No. 17); Jeffrey Steinberg, "From Cybernetics to Littleton: Techniques of Mind Control," *Executive Intelligence Review*, May 5, 2000 (Vol. 27, No. 18).
3. See Dino de Paoli, "Carnot's Theory of Technology: The Basis for the Science of Physical Economy," *Executive Intelligence Review*, Jan. 8, 1999 (Vol. 26, No. 2); and "Does Time Really Precede Existence? A Reflection on Prigoginism," *21st Century Science & Technology*, Spring 2000 (Vol. 13, No. 1).
4. Lyndon H. LaRouche, Jr., "The Becoming Death of Systems Analysis," *Executive Intelligence Review*, March 31, 2000 (Vol. 27, No. 13), p. 72.