

THE CYBERNETIC MANIFESTO*

Valentin F. Turchin[†] Cliff Joslyn[‡]

1 Philosophy

Philosophy is the putting of our thought and language in order. Philosophy is important. Philosophy is a part of our knowledge.

2 Knowledge

Cybernetic epistemology defines knowledge as the existence in a cybernetic system of a *model* of some part of reality as it is perceived by the system. A model is a recursive generator of predictions about the world which allow the cybernetic system to make decisions about its actions. The notions of meaning and truth must be defined from this perspective. Knowledge is both objective and subjective because it results from the interaction of the subject (the cybernetic system) and the object (its environment). Knowledge about an object is always relative: it exists only as a part of a certain subject. We can study the relation between knowledge and reality (is the knowledge true or false, first of all); then the subject of knowledge becomes, in its turn, an object for another subject of knowledge. But knowledge in any form (a proposition, a prediction, a law), irrespective of any subject is a logical absurdity. A detailed development of cybernetic epistemology on the basis of these definitions is critical for the formalization of the natural science and natural philosophy, and the interpretation of mathematical systems.

3 Freedom, will, control

Cybernetic metaphysics asserts that freedom is a fundamental property of things. Natural laws act as constraints on that freedom; they do not necessarily determine a course of events. This notion of freedom implies the existence of an agency, or agencies, that resolve the indeterminacy implicit in freedom by choosing one of the possible actions. Such an agency is defined as a will. A will exercises *control* over a system when the freedom of that system is constrained by actions chosen by the will.

4 God

We understand *God* in the spirit of pantheism. God is the highest level of control in the Universe. God is for the Universe what human will is for human body. Natural laws are one of the

*Appears in *Kybernetes* 19:2-3, 1990

[†]Computer Science, City College of New York

[‡]Systems Science, SUNY-Binghamton, Binghamton, NY 13902 USA, (607) 729-5348, cjoslyn@bingvaxu.cc.binghamton.edu

manifestations of God’s will. Another manifestation is the evolution of the Universe: the Evolution.

5 Metasystem transition

When a number of systems become integrated so that a new level of control emerges, we say that a *metasystem* has formed. We refer to this process as a *metasystem transition*. A metasystem transition is, by definition, a creative act. It cannot be solely directed by the internal structure or logic of a system, but must always come from outside causes, from “above”.

6 Evolution

The metasystem transition is the quantum of evolution. Highly organized systems, including living creatures, are multilevel hierarchies of control resulting from metasystem transitions of various scales. Major evolutionary events are large-scale metasystem transitions which take place in the framework of the trial-and-error processes of natural selection. Examples include: the formation of self-duplicating macromolecules; formation of multicellular organisms; emergence of intelligent organisms; formation of human society.

7 Human intelligence

Human intelligence, as distinct from the intelligence of non-human animals, emerges from a metasystem transition, which is the organism’s ability to control the formation of associations of mental representations. All of specifically human intelligence, including imagination, language, self-consciousness, goal-setting, humor, arts and sciences, can be understood from this perspective.

8 Social integration

The emergence of human intelligence precipitated a further, currently ongoing, metasystem transition, which is the integration of people into human societies. Human societies are qualitatively different from societies of animals because of the ability of the human being to create (not just use) language. Language serves two functions: communication between individuals and modeling of reality. These two functions are, on the level of social integration, analogous to those of the nervous system on the level of integration of cells into a multicellular organism. Using the material of language, people make new — symbolic — models of reality (scientific theories, in particular) such as never existed as neural models given us by nature. Language is, as it were, an extension of the human brain. Moreover, it is a unitary common extension of the brains of all members of society. It is a collective model of reality that all members of society labor to improve, and one that preserves the experience of preceding generations.

9 The era of Reason

We make a strong analogy between societies and neural, multicellular organisms. The body of a society is the bodies of all people plus the things made by them. Its “physiology” is the culture of society. The emergence of human society marks the appearance of a new mechanism of Universal Evolution: previously it was natural selection, now it becomes conscious human effort. The variation and selection necessary for the increase of complexity of the organization of matter now takes

place in the human brain; it becomes inseparable from the willed act of the human being. This is a turning point in the history of the world: the era of Reason begins. The human individual becomes a point of concentration of Cosmic Creativity. With the new mechanism of evolution, its rate increases manifold.

10 Global integration

Turning to the future we predict that social integration will continue in two dimensions, which we can call width and depth. On the one hand (width), the growth of existing cultures will lead to the formation of a world society and government, and the ecological unification of the biosphere under human control. The ethics of cybernetical world-view demands that each of us act so as to preserve the species and the ecosystem, and to maximize the potential for continued integration and evolution.

11 Human super-beings

On the other hand (depth), we foresee the physical integration of individual people into "human super-beings", which communicate through the direct connection of their nervous systems. This is a cybernetic way for an individual human person to achieve immortality.

12 Ultimate human values

The problem of immortality is the problem of ultimate human values, and vice versa. Living creatures display a behavior resulting from having *goals*. Goals are organized hierarchically, so that in order to achieve a higher-level goal the system has to set and achieve a number of lower-level goals (subgoals). This hierarchy has a top: the supreme, ultimate goals of a creature's life. In an animal this top is inborn: the basic instincts of survival and reproduction. In a human being the top goals can go beyond animal instincts. The supreme goals, or values, of human life are, in the last analysis, set by an individual in an act of free choice. This produces the historic plurality of ethical and religious teachings. There is, however a common denominator to these teachings: the will to immortality. The animal is not aware of its imminent death; the human person is. The human will to immortality is a natural extension of the animal will for life.

13 Decline of metaphysical immortality

One concept of immortality we find in the traditional great religions. We designate it as *metaphysical*. It is known as immortality of soul, life after death, etc. The protest against death is used here as a stimulus to accept the teaching; after all, from the very beginning it promises immortality. Under the influence of the critical scientific method, the metaphysical notions of immortality, once very concrete and appealing, are becoming increasingly abstract and pale; old religious systems are slowly but surely losing their influence.

14 Creative immortality

Another concept of immortality can be called *creative*, or *evolutionary*. The idea is that mortal humans contribute, through their creative acts, to the ongoing universal and eternal process – call

it Evolution, or History, or God – thus surviving their physical destruction. This uniquely human motive underlies, probably, all major creative feats of human history.

15 Cybernetic immortality

The successes of science make it possible to raise the banner of *cybernetic* immortality. The idea is that the human being is, in the last analysis, a certain form of organization of matter. This is a very sophisticated organization, which includes a high multilevel hierarchy of control. What we call our soul, or our consciousness, is associated with the highest level of this control hierarchy. This organization can survive a partial — perhaps, even a complete — change of the material from which it is built. It is a shame to die before realizing one hundredth of what you have conceived and being unable to pass on your experience and intuition. It is a shame to forget things even though we know how to store huge amount of information in computers and access them in split seconds.

16 Evolution and immortality

Cybernetic integration of humans must preserve the creative core of human individual, because it is the engine of evolution. And it must make it immortal, because for the purpose of evolution there is no sense in killing humans. In natural selection, the source of change is the mutation of the gene; nature creates by experimenting on genes and seeing what kind of a body they produce. Therefore, nature has to destroy older creations in order to make room for the newer ones. The mortality of multicellular organisms is an evolutionary necessity. At the present new stage of evolution, the evolution of human-made culture, the human brain is the source of creativity, not an object of experimentation. Its loss in death is unjustifiable; it is an evolutionary absurdity. The immortality of human beings is on the agenda of Cosmic Evolution.

17 Evolution of the human person

The future immortality of the human person does not imply its frozen constancy. We can understand the situation by analogy with the preceding level of organization. Genes are controllers of biological evolution and they are immortal, as they should be. They do not stay unchanged, however, but undergo mutations, so that human chromosomes are a far cry from the chromosomes of primitive viruses. Cybernetically immortal human persons may mutate and evolve in interaction with other members of the super-being, while possibly reproducing themselves in different materials. Those human persons who will evolve from us may be as different from us as we are different from viruses. But the defining principle of the human person will probably stay fixed, as did the defining principle of the gene.

18 How integration may occur

Should we expect that the whole of humanity will unite into a single super-human being? This does not seem likely, if we judge from the history of evolution. Life grows like a pyramid; its top goes up while the basis is widening rather than narrowing. Even though we have seized control of the biosphere, our bodies make up only a small part of the whole biomass. The major part of it is still constituted by unicellular and primitive multicellular organisms, such as plankton. Realization of

cybernetic immortality will certainly require some sacrifices — a vehement drive to develop science, to begin with. It is far from obvious that all people and all communities will wish to integrate into immortal super-beings. The will to immortality, as every human feature, varies widely in human populations. Since the integration we speak about can only be free, only a part of mankind — probably a small part — should be expected to integrate. The rest will continue to exist in the form of “human plankton”.

19 Integration on the Cosmic scene

But it is the integrated part of humanity that will ultimately control the Universe. Unintegrated humanity will not be able to compete with the integrated part. This becomes especially clear when we realize that the whole Cosmos, not the planet Earth, will be the battlefield. No cosmic role for the human race is possible without integration. The units that take decisions must be rewarded for those decisions, otherwise they will never take them. Can we imagine “human plankton” crowded in rockets in order to reach a distant star in ten, twenty or fifty generations? Only integrated immortal creatures can conquer the outer space.

20 Current problems

At present our ideas about the cybernetic integration of humans are very abstract and vague. This is inevitable; long range notions and goals may be only abstract. But this does not mean that they are not relevant to our present concerns and problems. The concept of cybernetic immortality can give shape to the supreme goals and values we espouse, even though present-day people can think realistically only in terms of creative immortality (although — who knows?). The problem of ultimate values is the central problem of our present society. What should we live for after our basic needs are so easily satisfied by the modern production system? What should we see as Good and what as Evil? Where are the ultimate criteria for judging social organization? Historically, great civilizations are inseparable from great religions which gave answers to these questions. The decline of traditional religions appealing to metaphysical immortality threatens to degrade modern society. Cybernetic immortality can take the place of metaphysical immortality to provide the ultimate goals and values for the emerging global civilization.

21 Integration and freedom

We are living at a time when we can see the basic contradiction of the constructive evolution of mankind very clearly: it is the contradiction between human integration and human freedom. Integration is an evolutionary necessity. If humanity sets itself goals which are incompatible with integration the result will be an evolutionary dead end: further creative development will become impossible. Then we shall not survive. In the evolving Universe there is no standstill: all that does not develop perishes. On the other hand, freedom is precious for the human being; it is the essence of life. The creative freedom of individuals is the fundamental engine of evolution in the era of Reason. If it is suppressed by integration, as in totalitarianism, we shall find ourselves again in an evolutionary dead end. This contradiction is real, but not insoluble. After all, the same contradiction has been successfully solved on other levels of organization in the process of evolution. When cells integrate into multicellular organisms, they continue to perform their biological functions—metabolism and fission. The new quality, the life of the organism, does not appear despite the biological functions of the individual cells but *because* of them and *through* them. The creative

act of free will is the “biological function” of the human being. In the integrated super-being it must be preserved as an inviolable foundation, and the new qualities must appear through it and because of it. Thus the fundamental challenge that the humanity faces now is to achieve an organic synthesis of integration and freedom.