# *Credo*

*Editor's Note.* This is the second time *Zygon* has published a more personal statement relating science and religion under the heading of *Credo*. In contrast to the intentionally worked out set of reflections by Marjorie Hall Davis in the September 1987 issue, this "credo" statement by Erwin Laszlo comes in the form of a more spontaneous discussion with interviewer Joseph H. Schaeffer. It was neither the intention of Laszlo nor Schaeffer to have this be published as a credo statement in the strictest sense. Yet, as editor, it seems to me that the following discussion substantially presents a personal set of convictions regarding the search for meaning and purpose in the context of the contemporary sciences; hence it qualifies for being published under the heading *Credo*. A distinctive feature of this particular set of reflections by Laszlo is their unfinished nature: consistent with Laszlo's emphasis on humans being an important and distinctive part of an evolving universe, one must see all human reflection, even of fundamental convictions, as tentative, exploratory, and evolving. This is a very unusual type of credo, yet one quite consistent with living in the spirit of a scientific age.

## BELIEFS ABOUT EVOLUTION, MIND, NATURE, AND SOCIETY: EXCERPTS FROM AN INTERVIEW WITH ERVIN LASZLO

*by Joseph H. Schaeffer*

*Abstract.* Fundamental questions arise in every age, questions such as those concerning the individual in society, social order, labor and exchange, meaning and ethics, and spiritual life and

Ervin Laszlo is a philosopher and general systems theorist. He is a member of the Club of Rome, a fellow of the United Nations Institute for Training and Research, a senior fellow of the Center for Peace Studies, a distinguished tutor of the International College, and a director of Planetary Citizens. He is founder-director of the General Evolution Research Group and editor-in-chief of the World Encyclopedia of Peace. Laszlo has published over forty books and 200 articles. His most recent book is *Evolution: The Grand Synthesis* (Boston: Shambhala, 1987). Joseph Schaeffer is professor of anthropology and communication at Marlboro College, Marlboro, Vermont 05344. During the past two years he has traveled to fifteen countries on four continents to conduct interviews with internationally known scientists, social scientists, novelists, artists, philosophers, and professionals in business and politics as part of a comparative study of human values and global issues.

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values. In addressing these questions Ervin Laszlo emphasizes insight and understanding, the mutability and flexibility of knowledge, cultural diversity and organizational interdependence, and harmony in nature. General Systems Theory and a theory of general evolution provide the framework for his thinking. He asks that as human beings we assume responsibility for creative, reasoned, ethically sound decisions in dealing with the inner and outer limits of humanity.

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JOE SCHAEFFER: What is the nature of human thought in evolution?

ERVIN LASZLO: This is a very crucial question. I could sum up my answer in one key word. Responsibility. When a system has a high level of mentality, the kind of level which is associated with human consciousness, which brings with it the ability not only to perceive but also to perceive its perception, to know that it knows, that system is responsible for its actions.

Earth, as tiny as it is, is a remarkable region of the universe, because it includes a species of system, human beings, that has this capacity for mentality. There may not be many such regions. We do not know for sure. Because they have this capacity, human beings have the responsibility to think before they act and to be responsible for the outcomes of their actions to the extent that such outcomes can be foreseen.

SCHAEFFER: Is this position close to Kant's argument that history generates the potential for morality?

LASZLO: Yes. But it is not couched in the same framework of thinking. Morality is not a given thing. We articulate absolute moral principles and then judge individual acts in specific contexts on the basis of those principles. There is a logic or a reason in evolution, but it is not preconceived. Evolution is an unfolding of a pattern, and we are part of this pattern. If we act in a way which reverses the pattern (which we could well do by misusing the environment), we may destroy our chances for survival.

I often wonder whether any species is capable of surviving the point we have reached in evolution. We produce and use high levels of energy. The situation is very risky because our capacity for destruction is so great. We need to exercise our ability of foresight and recognize our responsibility to ourselves, to our species, and to our environment.

SCHAEFFER: On what basis do we act responsibly?

LASZLO: I would choose an enlightened utilitarianism as a basis for action. The results of our actions should be beneficial in relation to the natural process. The right way is nature's way. By nature I do not mean only nonhuman nature. Human nature is probably a specification, a local variation, in an open, evolving system. We must adapt our actions to that system. We must follow the directional process which includes physical, biological, and social processes moving through time. This is close to Taoist philosophy. We must live in harmony with nature. Then we can fulfill our role and, in doing this, fulfill ourselves.

SCHAEFFER: Can we ever know the pattern of the process you are speaking of at the meta level?

LASZLO: One must have knowledge, see that which the knowledge is about, and then compare the two to find a pattern. Knowledge is always imperfect. It is always evolving as it is falsified. In a sense, it becomes more and more adapted to reality, adapted to the pattern which lies there someplace in the unknowable. That which we will never know.

We are not capable of "immaculate perception." We only see the world through theories in our minds. In our day-to-day life, these theories are tested for success in terms of whether they convey meaning, make sense of what we experience. If they make sense, they enable us to act. As we act to achieve our purposes, we develop efficient functional maps of the environment. The more successful maps tend to be propagated and, unless we are totally dogmatic, the less successful maps gradually fall into disuse and are abandoned. It is important that we remain flexible. We must test each understanding carefully, not abandoning it too quickly but not holding onto it if it obviously does not fit.

SCHAEFFER: Children come into the world genetically prepared to develop useful, appropriate, efficient maps. Then they learn at the hands of their environment, often their parents, inappropriate maps which are not efficient, which do not lead to correct action. As they mature, they must reconnect to the original openness and rebuild new maps which work.

LASZLO: There is always the danger that the immediate guidance that one receives from one's parents or immediate environment is inefficient or false and that it will have to be corrected. But I also think that there are some basic maps which have been developed over many generations of previous cultures and have actually entered as some kind of an ambient field, a mental field. I call it the *psi field*. The child

actually can communicate with that field simply by virtue of the fact that he is a human being.

SCHAEFFER: Do these archetypal maps reduce the potential for dogmatism? Are they open and creative? Or do they perpetuate mistakes from the past?

LASZLO: I think this has a lot to do with our stage of cultural development, our phase in the development of human consciousness. There seems to be a real parallel between the development of consciousness in cultural evolution in the species and the evolution of the individual from birth through maturity. In the infant, as we see in the works of Jean Piaget, and also in the earliest phases of cultural evolution, there is a kind of undifferentiated wholeness. The self is not set off separately from the world. The world is somehow an extension of the self. The self is part of a vague, oceanic kind of unity.

In the next stage the self is separated from the world. The individual says: Here is where I live; I am aware of being mortal; I have a life; there are things around me; they are outside by skin; there are other people. This happens in a child. It also happens in the development of culture. When this kind of consciousness is systematized, it culminates in the kind of fragmented, materialistic, discipline-bound knowledge that we have developed through the period of modern science in the last two hundred years or so. Everything is seen as a material body moving around in space and time.

In the third stage we move toward a recovery of unity on a higher level. We perceive that the self is part of a world that has some basic unity in its diversity. It forms, in some sense, a whole. We first saw a vague landscape. Then we began to see trees. Now we see the forest with the trees. We see the whole and the parts together.

SCHAEFFER: Does this have implications for the social order in which we find ourselves today?

LASZLO: This kind of thinking is very intimately tied to the fact that our levels of interdependence and interaction are forcing us to understand that the various societies in the world cannot be separated from each other. It is not accidental that this paradigm shift is occurring in our cognitive maps. The world is closing in on us, the networks of communication that are developing so very rapidly around us tie us ever more closely to other cultures. All around us interdependent interaction is increasing. Once we move our ways of thinking ahead, once we catch up to and go beyond this paradigm shift, we can start designing alternative social, economic, political systems.

SCHAEFFER: What will be some of the characteristics of the new systems, particularly with regard to the lives of individuals?

LASZLO: The level of freedom of the individual varies a great deal according to whether a society is stable or unstable. Contrary to the popular assumption, freedom is possible in an unstable state, not in a stable state. In a stable state the degrees of freedom are more limited because there are very well established laws, regulations, and orders which constrain the individual's behavior. Personal expression and personal development are possible, but the impact of the individual is restricted.

However, when the situation is unstable, when bifurcations can occur, very small inputs can flower and create very large effects. An individual, a Lenin or a Hitler, for example, with a set of ideas, can enter a system at the precise moment when that system is most sensitive and can have a tremendous impact, for better or for worse.

SCHAEFFER: Is one of the goals to maintain a certain kind of instability in the system so that the potential for creative variety continues?

LASZLO: Instability is always a risk. Phases of instability are, by their very nature, indeterminate. They are the result of fluctuations that arrive within the system. Those fluctuations have to be rendered precisely and be well conceived for instability to be a reasonably safe process. Therefore, to enter a path of constant instability is, I think, to take an unreasonable risk.

SCHAEFFER: What might the world order look like given the processes you are talking about?

LASZLO: It is very difficult to lay this out in any detail. There needs to be more convergence. By convergence I mean the formation of higher-level systems by sets of lower-level systems. Right now we have one hundred eighty nation-states, roughly, and they each consider themselves to be independent sovereign states. The result is that there can be no dependable regulation on the global level. We need to develop higher inclusive levels and then to integrate all levels. I can see an ideal situation in which all levels penetrate all other levels from the village to the world. Thousands and thousands of small groups, each with its own identity, would be functionally and dynamically related to each other in larger scale social, economic, and political units in which the voice of each group could be heard and have an impact. Subregions would be organized on regional levels, regions on interregional levels,

and interregions on the global level. Higher levels would perform successively more limited functions of controlling certain interactions. The global level would only coordinate the functions at lower levels.

SCHAEFFER: In a sense you are trying to integrate the small is beautiful idea with the wholistic world order idea.

LASZLO: Yes, small is beautiful can be a very short-lived experience. For each smallness to be beautiful, coordination at a higher level is necessary. Certain decisions and certain kinds of processes can be best handled at certain levels. It would be counterfunctional to try to regulate, for example, the behavior of truck drivers on the global level or to establish some kind of common morality or ideology on a very large scale. These things must be left to the grass roots levels. But certain rules as to the kind of security provisions and armies that can be maintained in the world should certainly be considered on the global level.

SCHAEFFER: How do we establish something like the United Nations Bill of Universal Rights within this framework?

LASZLO: It would be nice if we could agree on some basic concepts regarding human rights. But I do not think this is possible now. We cannot even agree on practical political/economic matters. How can we agree on the morality of certain types of actions having to do with human rights?

Still, it seems critical that we abstain from actions which have an unusually high risk of perverting the evolutionary process. We must at least spell out the actions in relation to the natural environment which are necessary to the overall persistence of this dynamic system of which we are part. We can do this better if we understand that system itself. We know, for example, that in nondeterministic systems internal parts must be relatively free to maximize certain potentials. Further, systems and subsystems evolve as co-evolutionary partners. If one system "chooses" a path at the expense of one of its partners it must pay a price.

SCHAEFFER: Can General Systems Theory principles become the unconscious basis for moral action?

LASZLO: We ought to know the patterns and processes of evolution so that we can live responsibly. The theories and frameworks of evolution can be evident in symbols of all kinds. In a way, we communicate to ourselves the realities of evolution through these symbols. The more

access we have to them and the more we internalize them, the better the chance that we will live a life which goes with rather than against the given patterns and processes.

SCHAEFFER: Questions concerning epistemology are relevant here, it seems to me. How can we best know about reality?

LASZLO: We are locked in our own minds. There is no way to get out. Ultimately it is our own experience that we know. We can know it systematically, we can make it coherent. Yet there is no guarantee that it is not just an illusion. If the solipsist presses this argument the solipsist will always win.

The way to deal with the solipsist's argument is to ignore it. We have to behave as if we have the firm knowledge that there is a world which is knowable, that our sense impressions are actually a representation of a four-dimensional (or more) world outside. That world can have an effect on us, on our body-mind systems. If we make this assumption, we can try to make sense of our experiences. We can try to see what kind of reality could give rise to those experiences.

But we have to make that imaginative leap. Once we have made it the question becomes: What is the most systematic way of organizing our experience? To me the most systematic way is through General Systems Theory. I am looking for the overall coherence of experience. I think probably this is a result of my involvement with music. I am looking for harmony. To me that which makes the most sense, that which is most real, is that which is the most general. This immediately puts me at odds with most specialists and the majority of the contemporary science establishment.

SCHAEFFER: Can you tie this thinking to the nature of science and its role in human life?

LASZLO: Originally, science was supposed to be an inquiry into the nature of reality, into objective patterns and processes in a world beyond one's immediate internal experiences. Its goal was to convey as much coherent knowledge as possible given the limitations of the self and the imposed limitations of the scientific method. However, there are other ways of rendering human experience coherent: philosophy, for example, and, going even further from science, theology and mysticism.

Let me be more specific. One has to start with common sense, the basic mapping of reality, which I mentioned earlier, which gives us objects and people and trees and stones and so on. If one wants to make

sense of this one has to have some general understanding of relations among the objects. One assumes, for example, that there are causal relations among them. Then, if one is interested in the more specific reasons why certain kinds of things happen, one begins to perform tests on them. The tests can lead to an understanding of the regularities in the relationships between things. Theories can then be developed to make sense of those regularities. These theories can be used not only to explain the regularities but also to predict them. Predicting them becomes a basic element in the testing or the falsification of the theory.

Theoretical science has, on the whole, moved within the boundaries of disciplines. There is an attempted integration within physics with general relativity theory, unified field theories, grand unification theories, and so on. And there is an attempted integration within the life sciences with the theories of macroevolution, neo-Darwinian synthesis, and so on. There is also a need to look at the possibility of relating these already integrated theories in a conceptual framework that endows each of them with coherence and makes clear the relationship among them. This used to be the task of philosophers, but it is also important now within the new sciences of complexity.

Another level of need, until recently, has called for religious or spiritual consideration. This is the need to find the relation between the physical aspects of our experience and the mental/intuitive, almost mystical aspects in a new unity and oneness. Great scientists have always emphasized the importance of intuition while, at the same time, regretting that science has so little to say about it. There has been a gap between the spiritual and the physical explanations of the universe. It is important now to see whether a consistent and logical framework can be built in which the various laws and theories that are postulated in the natural and the social sciences about the physical/social universe can be connected with spiritual aspects of experience.

Eventually we might work our way toward an integrated understanding of all that there is in the general stream of experience. We will not do this in every detail. But we can, perhaps, explain the general patterns of experience within a single self-consistent theory. When I say single I do not mean final. Any theory will be subject to change. But at any given time we can search for the simplest possible set of explanations or concepts that describe the case before us.

I think everything that we experience is possible evidence to be taken into account in our theories. Everything that is experienced calls for some explanation. I perceive diversity in reality, what the Greeks called the *manifold nature of reality*. At the same time, I am constantly asking whether it is possible to find a pattern in the diversity, what the Greeks called the *one*. By the *one* I do not mean a single kind of a substance or a

single privileged entity like a cell or an atom. I mean, rather, an architectural design, a pattern, that is repeated in various kinds of transformations, a pattern that discloses something about the very nature of the universe in which we live.

SCHAEFFER: Your comments earlier about solipsism suggest that you see pattern as a construction based on the experiences of each individual.

LASZLO: Yes. A pattern is something we construct. But we do not stop there. We test that pattern for optimal fit to our experiential maps, as I suggested earlier.

The search for meaning is a basic attribute of the human mind. It is built into our perceptual apparatus. We actually perceive chaotic, kaleidoscopic images of sights and sounds, textures and tastes, which we are constantly making into meaningful experiences. The common-sense world is one level of meaning, of sense. The scientific world is a second level. The mystical world is yet another level. When we bring all these together we will be in touch with the highest level. That highest level may not be available to us at the present time, but we should not give up the search for it.

SCHAEFFER: How is the spiritual dimension relevant in your own life at this point?

LASZLO: I have not arrived there yet. I have a feeling, even a hope, that I might be going in that direction. One is strongly allied with one's phase in life, as the Buddhists would say, with one's age. There are different types of activity, different types of engagement in the French sense of *engagement*.

One should be able to go wherever one needs to go to gain as much insight as is possible in the later phases. This one can do when one is liberated from the requirements of a profession, from the necessity to gain a livelihood, from the restrictive framework of a social order. One must go into the woods, as it were, to do this. I hope to create an environment for myself in which I can live this way when I am ready.

SCHAEFFER: Will this journey into the woods be an exploration or a letting go?

LASZLO: It will be an attempt to satisfy myself. I am not quite sure that we have only one life. Maybe this thing that we call a mind is a part of a

much vaster collective consciousness or source of consciousness. However, assuming that we have one life, we have to satisfy ourselves that we have lived it without leaving out the major elements. The mind is capable of thinking, capable of understanding. One would be leaving out a great deal if one did not try to understand as much of the range of human experience as possible, regardless of what it takes, regardless of what conceptual frameworks are necessary.

SCHAEFFER: How does thought happen for you?

LASZLO: I do not think it is a systematic process. If I were to stop and say to myself, now you are going to think these things through, I would sit here and stare into space. Nothing would occur to me. Insights usually come to me when I am not thinking about something consciously. Some of my best thinking happens when I am playing the piano, when I am very much involved with the music. I am in the middle of a piece and all of a sudden I have a useful insight about something. I also have insights late at night before I go to sleep or first thing in the morning when I wake up. Sometimes thoughts occur to me when I am talking with others about something completely unrelated to those thoughts.

But none of this happens if I am not working on a problem. One has to be bothered by something to think clearly. Learning comes from a disturbance in systems. I do not mean that you have to lead a kind of life in which you "worry" about problems of an intellectual nature but you have to accept the fact that problems are there—you cannot set them aside.

Basic problems, of course, have no final solutions. Most of them have a solution that you can accept for the time being or, better, that you feel is really an advance over something you thought before. There are times when you feel that you have discovered an original concept, the nucleus, the seed of a notion. Then you have to sit down and work out that notion. Very often the seed changes, sometimes it evolves, sometimes it is replaced by another seed. But it is something to work with, a base on which to build.

The building process is a reasonably logical process. You do not necessarily follow rules, but you do put things together in a coherent way, in a context. You see how your data line up with the arguments you have developed. You find points of confirmation as well as anomalies. You have new insights. Something happens you did not expect and then you decide what to do with it.

To me there are no individual insights in a vacuum. Things make sense because they are in a coherent pattern. I seldom hesitate to

replace or to throw away a single idea even though it seems reasonable in light of a given experience if it is inconsistent with a larger framework of thought. The total system of ideas conveys the truth value.

SCHAEFFER: What are your criteria for distinguishing intelligent from nonintelligent systems?

LASZLO: First, success in reaching the goals of survival and persistence in a milieu, perhaps in competition with others. Second, the ability to revise strategies either to enhance success or to correct for failure.

SCHAEFFER: What is the nature of human understanding?

LASZLO: It is very difficult to understand another person. We are each extremely complex. I must say that in the past I did not have a great need to understand people around me in the fullest sense. I was too taken up with trying to understand reality. Lately I have come to see that I do need to understand people. The deeper understanding I am interested in now calls for empathy. Empathy is mysterious. It is beyond the physical phenomena, the sound waves that we decode in our brains. It is a spontaneous interaction. It does not end at the limits of the skin.

There are certainly radiations, or vibrations, that we do not quite understand that emanate from each individual. In true understanding there is some kind of harmonization of these vibrations. Love is an example of this kind of understanding.

SCHAEFFER: To me the process of human interaction implies an agreement that we will not understand each other. That agreement is in itself the bonding device. If we ever did understand each other our communication would cease.

LASZLO: Your point makes sense at the level of ordinary human interaction.

In talking about the process of dialogue Plato said that understanding is there but that it has to be called forth. This seems correct to me. We understand things, but we do not realize that we understand them. Through dialogue we can unearth that understanding. Sometimes the complementary perspectives that different people can bring to bear on a single problem can lead to sudden insight.

SCHAEFFER: What is the nature and purpose of spoken language in human interaction?

LASZLO: I do not want to engage in the genetic fallacy by trying to derive the meaning of something by referring to its origins, but it is worth noting that language probably had very different functions in the distant past than it does now. Human beings are self-organizing systems with the capacity for altering their own behavior. At some point in their evolution the need arose for the development of a code which would increase their ability to coordinate actions through the cooperative division of labor. Language served this function. As a means of communication it brought with it greater flexibility in behavior and more efficient use of energy. It made it possible for human beings to identify sources of negative entropy in the whole life process and to guide their behavior in society accordingly. It opened up possibilities for adaptation. Language also developed as an abstract system human beings could use to contemplate alternatives—removed from the immediate reality of action. With language they could consider other things than the immediate persistence of society.

When we look at language today we see a number of seemingly unrelated purposes. Language is used to fulfill one's need for power, for logical experience, for art, for belonging, for whatever. These functions of language were not planned. They are accidental outcomes of a capacity that had particular value in evolution. Now that these outcomes have developed, of course, they mold the very species of which they are a part. Human societies are, in fact, completely dependent now on symbolic communication for their existence.

SCHAEFFER: One of the challenges of interdependency seems to be the finding of common languages to speak across borders. Yet it is critical that we ensure social pluralism as well.

LASZLO: We must distribute diversity. We can be unified without being uniform. Unity is not uniformity. We can be diverse as long as we can relate to each other's differences.

I cannot accept the idea that there are several answers to most questions that are equally good. There are several ways in which one can think about questions, but there is usually a higher level framework which we cannot see at some point in time which, when we see it, helps us to find answers which resolve lower level differences. We must always remain open to the possibility of finding the higher level frameworks.

People can be diverse within the same society or among societies, but they still have to coexist within the selfsame larger structure. That structure, in fact, makes possible the diversity, the required variety.

SCHAEFFER: Do you see individuals as submerged in a culture, limited by the choices available to them, reasonably well-defined by their interactions with others, or are they the center of control, creativity, and responsibility? What is the role of the individual in society?

LASZLO: There is a paradox here. As society has developed historically it has created more flexibility for the individual, but it has also submerged the individual in a greater complexity. The individual knows less and less about his society. One is able to describe smaller and smaller aspects of social reality, to find one's way around less and less.

As "good agents" of evolution, individuals must try to create an increasingly complex, increasingly accomplished understanding of social structure, for that structure necessarily circumscribes the innate behavior of those individuals. Society is efficient and reliable when everyone does his or her share. However, human nature does not permit this to occur. Regimented society may be very functional on the level of the social system, but it is inhuman on the level of the individual.

As individuals we are wholes made up of parts, and we are parts of wholes at the same time. We are obviously affected by the systemic relations within us. We are also part of the underlying larger relationships in our society, from the family to the global social system.

The evolution of the social system is not necessarily consistent with the greatest good of the individual. It may be in our personal interest to block the evolution of the social system as a whole. We could, for example, break down the evolving larger units into smaller units which act essentially alone.

We cannot look at the whole evolving universe from the outside. If we could, we would see an evolving whole, the largest level of system which defines the function of the parts and gives meaning to their existence. Yet each of us sees ourselves as one particular part in the process. Our greatest interest is in keeping our level superordinate. We each want to be on top.

Society has developed very gradually, parallel with the evolution of human consciousness but it is still a much simpler system than consciousness. The hominid species is several million years old. Society is a very recent kind of system in comparison. It is evolving very rapidly now, of course, through the actions of individuals.

There is always the danger that the individual will lose sight of the whole. At the same time it is important that the individual does not become totally regimented within the larger system. If Hitler had won the war, for example, he might have created a thousand-year reich in which the individual was totally subordinated to the system. The same

thing could have happened under Stalin. Given the techniques for controlling behavior that we have at our disposal today, it is not impossible for systems to arise which would have power over individuals to such an extent that they would become nothing more than cogs in a machine. Perhaps we ought to optimize evolution on the level of the individual and then allow it to unfold on the level of society.

SCHAEFFER: Is the self-fulfillment of each individual a reasonable goal in this process?

LASZLO: It is not a goal of society. It is a goal of each individual. The goal of any system is to resist disturbance and change. It tries to maintain itself in a variety of circumstances, to persist. For individuals, self-fulfillment may be related to self-maintenance. But it is not relevant at the level of society.

SCHAEFFER: John Dewey wrote: "Perhaps there is no better definition of culture than that it is the capacity for constantly expanding the range and accuracy of each individual's perception of meanings." He argued for increasing meaningfulness in the lives of individuals in society.

LASZLO: Culture can be an attribute of society, a system of relationships in a society, but it can also be viewed as an information process in the minds of individuals. Dewey seems to be talking about the latter—what is going on in individuals.

Culture is not necessarily positive. It can be negative from the viewpoint of the self-fulfillment of individuals. Nazi culture, for example, is a poor culture from the point of view of the individual.

SCHAEFFER: Walter Lippman argued that: "Progress comes through the emancipation from, not the restoration of privilege, power, coercion, and authority of and over individuals." Government should emancipate the individual from coercion.

LASZLO: He is talking about government which is defined, directed, and managed by individuals. Ideally a society should be a tool for individual self-fulfillment; that is to say the society is the means of an individual's fulfillment.

Society is just another level of the system over and above the individual. For me it is very important to keep the two levels in mind. If you want to make an analogy, talk about the cell and the individual. You cannot reduce the individual to a cell. You cannot equate a cell with an individual. But you could say that to be fulfilled the cell has to be part of an organism.

SCHAEFFER: What are the major problems in the world today and what should we be doing to address those problems?

LASZLO: The major problem is that societies are not sustainable. There are exceptions, of course, small groups of people who reformulate the structure of their existence. But societies, on the whole, are on a nonsustainable path. It is not a question of whether they want to change or not, they will have to change, the question is how soon they change and at what price. As a general rule it is fair to say that the longer they wait the greater the price.

There are many problems to be solved related to technology, employment, food, the environment, and the distribution of resources and wealth, and so on. Given the continuation of present trends, all these problems will become worse. If we had a stable population, a more reasonable system for cooperative problem-solving, and a more educated population we could deal with these problems.

SCHAEFFER: This seems to me to get to a more basic problem, the critical problem of our age, the need for a transition from independence to interdependence.

LASZLO: In biological evolution sets of systems are intercommunicating. They tend to adapt to one another and to form higher level organizations. This is what is happening in society. We are forming higher level systems which are beyond the level of the nation or the corporation. Yet we act as though we are still independent sovereign national states.

SCHAEFFER: What are the roles of conflict and cooperation in the present international situation?

LASZLO: If conflict is regulated, it can become coordinated competition. Conflict is necessary. It is a normal part of any social system from the family to global society. But it must be nondestructive. It must be controlled so that it does not destroy the very system of which it is a part.

SCHAEFFER: What is the central meaning of war in human society?

LASZLO: It certainly is one of the greatest errors that cognizing human beings can make; to believe that the way to resolve a conflict between groups is by violence. In war the human mind brings to the process of interaction a tragic misreading of the original instinct for dominance.

SCHAEFFER: In a self-producing, self-maintaining system we must allow for the creation of variety within necessary limits so that the system does not self destruct. How do we do this?

LASZLO: It is easy to theorize about what we do Monday morning, but it is difficult to say what is actually going to happen Monday morning. The best I can do is to plan for what I think might happen.

In evolution, bifurcations occur at certain points. Following these bifurcations new dynamic shapes develop. New species arise guided by new rules and principles. The same thing happens in society. New forms, new regimes, are created at certain points. When this happens all we can do is to adjust as quickly as we can. It helps if we have already looked at the structures that have the best chance of coming into being when change occurs.

No one foresaw what would happen as a result of the French Revolution. A major fluctuation occurred which transformed society. The outcome was, first, unexpected chaos and terror and, then, the rise of rigid controls under Napoleon. No one could have planned for this chain of events. However, some of the worst outcomes might have been avoided if the leaders of the revolution had planned for at least some of the possible outcomes.

SCHAEFFER: What is our place in the natural environment? Are we stewards? Are we in charge? Are we subjects?

LASZLO: As I said earlier, we are the most conscious part of the natural world. We have the ability to reflect on our own knowledge of the environment. The responsibility for the environment rests with us. It cannot rest with species which are unable to reflect on their own behavioral plans for alternatives. We are the stewards. Yet we are not stewards from the outside. We are conscious reflective components of the ecosystem. It is not our job to make it serve us. Rather, we must recognize that our lives, our future, our evolution depend upon the persistence of the system. It is our lot to reflect on this consciously. We must do this now.

SCHAEFFER: Dick Lewontin wrote: "A full understanding of the human condition demands an integration of the biological and the social in which neither is given primacy or ontological priority over the other but in which they are perceived as being related in a dialectical manner." What is your view of this?

LASZLO: We do not fit into the ecosystem very well as purely social beings. We fit as sociobiological beings in the sense that we are a biological species that has social relationships. The problem has to do with the extent to which we are a cultural species. An ecosystem is able to accommodate easily a species that adapts rather slowly, genetically, through time. Characteristics that do not work in species can be weeded out gradually in favor of characteristics that provide greater resilience in a mature system.

However, a species with culture, with consciousness, is a curious evolutionary gamble. Because culture enables a species to adapt to circumstances and to manipulate the environment in ways that other species cannot, it can further the evolutionary process. It can also make mistakes which can be potentially very destructive, not only to itself, but also to the ecosystem as a whole. We do not know what the outcome of this gamble will be.

SCHAEFFER: What are the roles of music and art in human life?

LASZLO: Music and art bring coherence and meaning to patterns of experience. They help us discover the meaning which underlies experience. They create a spirit which has its own internal meaning. For this reason, they are extremely gratifying. They make meaning easy for us. Normally we have to struggle to find meaning. In music and art it is almost given to us. Everything falls into its place aesthetically. Music is a kind of order in the structure of sound, a beautiful system that brings light to complexity in a nonsemantic, noncognitive way. In some sense music and art achieve that which we can only strive to achieve in science and religion.

In music I am an interpreter and a listener. In the other arts I am a perceiver. I do not understand what it is to be an original creator. What is satisfying to me in music is the self-evident perfection of meaning, the structure, the sense that everything is in its place.

SCHAEFFER: What are the things that need explanation in today's world?

LASZLO: Almost all the questions philosophers have asked for four thousand years remain unanswered. We have better raw materials, better data sources. We have explored some dead ends. Yet the great questions are still there, and they require explanations. We do not know if there is a purpose to existence; we do not know if there is a creator, if a human being with a mind, with consciousness, is a manifestation of some specific tendency in the universe or just one possible

solution among myriad others (not a very optimal one) to the problem of persistence.

What is the meaning of the life of an individual? Does that life survive as an actual individual identity or as a set of impressions, as memories imprinted somewhere? I suspect that nature is not so wasteful as to allow the richness of experience gathered in an individual's lifetime to be completely extinguished. However, I do not know by what mechanism those experiences could be recorded in time. Perhaps the life experience of an individual is sustained as a template for other experiences. We do not know. The answer to this question will bring meaning to life.

SCHAEFFER: I think it was Virginia Woolf who said that individuals live as long as their life experiences, their thoughts and acts, remain alive in the memories of other human beings.

LASZLO: That is one way to sustain the impression of life; there may be others. This universe is a creative universe with the dimension of the mind as an element in it. But it is possible that there is a natural matrix in which impressions, not only of human beings, but of all created systems, all emergent entities, are formed. The universe itself could evolve with the experiences of those systems that have emerged and are persistent.

I am convinced of two concepts. First, perception of the world, in a very general sense, is not limited to human beings. It is not even limited to complex multicellular organisms. It is a general characteristic of certain kinds of systems that evolve, that emerge in nature in successively more complex forms. The universe is becoming self-aware through these kinds of systems.

The second point I would mention is a first statement of a hypothesis concerning what I called the *psi field* earlier (psi for psychic—something other than physical). My basic assumption is that the range in the field of mental phenomena is subject to the same laws of conservation as dynamic energy phenomena in the physical universe. According to the laws of physics, energy is conserved. It is only transformed from one form to another, so that nothing is lost in the universe. The universe is closed as far as its energetic processes are concerned. When something occurs in the physical universe, it is, according to the physical laws, propagated infinitely to the rest of the universe. All physical actions are conserved in the physical universe.

There is a tremendous contrast between this and our mental experience, which is our most immediate and our richest experience. We are confronted with the possibility that no matter how rich the life, how deep the experience, how enormous the memory, it will all vanish

completely without a trace either when the brain is damaged or when an individual dies. This asymmetry between the physical and the mental dimensions of the universe, it seems to me, is unreasonable and unacceptable.

I am beginning to think that something similar to a conservation of mental events, analogous to the conservation of physical events, occurs in the universe. The experiences of dynamic systems, systems that evolve in whatever form, from the material life particles extending to organic species and their ecologies, even planetary systems such as the Gaia system, interact and are conserved in some way. The store of experiences accumulated in each individual enter into an aspect of the universe which is parallel with the gravitational fields, electromagnetic fields, and so on. This is what I am calling the *psi field*. In this view experience is a basic feature of the universe. It is maintained as a record of the evolving universe.

SCHAEFFER: What criteria would a system have to fulfill to be able to contribute to the psi field?

LASZLO: An integrated, differentiated set of components would have to be present. There also would have to be a significant level of integration among these differentiated components so that the whole persists, changes, and evolves as a self-identical unit over time. This unit would also have to obey the laws of thermodynamics; it would have to replenish the energy that it is using up out of the free energy that it is converting to heat energy with fresh energies from the environment. Thus, it would have certain rigid physical constraints. I think it would be reasonable to assume that such a system would also have to have a mental dimension and that mental dimension would have to be interconnected with other mental dimensions in a field. The field would then represent the mental dimension of the universe.

SCHAEFFER: How would the mental process work in the interaction among systems?

LASZLO: I would like to make a distinction between artificial systems and natural systems. No system is totally artificial or totally natural, of course. Yet organizations are close to the kind of systems that we might call artificial systems, because often they are the result of human planning and design. Thus, entire cultures, societies, or, perhaps, nation-states might satisfy our definition of a natural system, because they do not emerge directly as a result of the design of individual minds. They do represent the outcome of the interaction of individual conscious minds but they do not reflect the will of individual minds. No

single individual can know the precise nature of the society in which he or she lives. A society is never simply the sum total of individual wills. It is a system on a higher level. When we analyze a society we must look at the whole instead of the parts (the individuals) because the minds of the individuals are not being directly reflected in the behavior of the whole.

SCHAEFFER: How can we understand the nature of the relationships among individual minds in such a system?

LASZLO: I think we can talk about social roles, roles that individual people with minds occupy. It is very difficult to look at the society as an interaction of unique individuals. (It would be just as difficult to see the human organism as the interaction of cells.) Yet the roles of the individuals can be very important indeed.

SCHAEFFER: Yes, but do the individuals have the mental experiences that you speak of? Roles are not conscious.

LASZLO: In itself, individual consciousness introduces a tremendous amount of what information communications theorists call *noise* into the system—indeterminacy. Different possibilities can unfold because individuals act according to differently perceived purposes. The system can become quasi chaotic as a result. There has to be a certain amount of consistency in the actions of individuals despite the uniqueness of their personalities and of their understandings of a situation. There must always be some level of coordination in the cognitive maps of the individuals. This creates the identity of a culture.

Culture (and the learning that goes with it) has made it possible for social systems to do something more than any system has done before namely, to infuse sufficient knowledge into the individual minds, so that these minds can actually understand some essential features of the dynamics of the whole system. (And again, the dynamics are not simply the sum total of individual perceptions. They are on a higher level.) If that understanding is basically correct, then the individual minds can enable that system to achieve some form of governance or guidance. The system need no longer act in a random or indeterminate way on its own level. The members themselves can govern it.

SCHAEFFER: When applied to contemporary social systems, this thinking implies a different basis for global decision-making.

LASZLO: If you understand the dynamics of the whole system in which you operate, the consequences of your actions will be different than if you only understand the dynamics of your own situation. Until now,

almost all of us have looked at our own situation and conceived of ourselves as acting in an exogenous environment, an environment which is outside of us. If we now see ourselves as endogenous, as part of the system as a whole, we can begin to optimize or maximize the parameters we consider valuable to that whole system.

SCHAEFFER: This implies the need for a new educational paradigm to me, if we are to help young children become full members in the dynamic processes you are talking about.

LASZLO: Yes, this presents a problem. It would be desirable to develop such a paradigm but the effects would be positive only if it is applied in a very large representative segment of the human population. The effects of enlightened action, action based on a perception of the dynamics of the larger system, are usually longer-term effects than those which result from action based on the immediate perceived narrow situation. If some people act on the enlightened level and others on the egoistic level, in the short term, the egoists win out and the enlightened people become marginalized.

Conscious action in light of the perceived whole, even at the level of nations and nation-states, would be far more advanced today if it were not for this situation. Leaders who begin to act more in the general human interest find themselves at a disadvantage in the short run. They often lose the game before they reach the point where there actions pay off.

SCHAEFFER: So you are talking about a major paradigm shift at a very high level that affects all nations, all governments, all institutions, at virtually the same time?

LASZLO: It is a civilizational shift. A piecemeal adjustment cannot be effective because the system will automatically eliminate the deviants.

SCHAEFFER: Is it possible that a grassroots understanding of what you are saying could develop and then become relevant at a higher level or must the change come from above?

LASZLO: There is no above from which it can come. The established system always acts as a negative feedback system. It tends to maintain itself. Every system, once it is established, will correct itself for deviation. Even biological species remain relatively the same. They come into being through rapid mutation. Then as long as they are present, they remain basically unchanged until they are replaced by other species.

The top level of any social system, the controlling level, is always conservative and will always try to maintain the existing system. However, there can be fluctuations, new movements, that come up from the lower levels. And some of these,if they cohere into meaningful actions such as social welfare movements, ecological movements, antiwar movements, or one-world movements, for example, can develop established networks and create powerful alliances. Then they can spread rapidly enough so that the overall system cannot eliminate them or reduce them to a manageable range. When the overall system becomes sufficiently crisis-ridden as to be vulnerable, then these alternative movements have a chance to replace that overall system.

This is the standard model of change in the last ten years in macroevolutionary theory in biology. It is also related to Ilya Prigogine's ideas in his studies of thermodynamics. He argues that the fluctuations in an unstable system can amplify very rapidly until a new dynamic regime is established. I think this same process applies to complex, evolving social systems.

SCHAEFFER: Differing circumstances have had major impacts on change in Western culture. I think of things such as the printing press and public opinion changes or the Crusades and the expansion of knowledge. What, in your mind, are the major circumstances that are likely to cause major changes in the future?

LASZLO: Probably all of the things that bring us into interaction, into closer interaction over vast distances. One can put it in terms of flows, for example, the globalization of the flows of money, of information, of energy, of products, of people. Major changes in the technologies for transportation and communication are related to these flows. They press people into unity before they are ready, before their cognitive maps are ready to develop global perspective.

SCHAEFFER: What are your revered hopes and fondest dreams?

LASZLO: It is very difficult to answer this question honestly, but I shall try. One of my fondest hopes is to contribute something to this world that would make it somehow easier to manage in a more satisfying way. This next very crucial step in the development of our species is really a turning point, a bifurcation point, that could end in extinction or in some degenerate state. We need to uphold human culture to survive. We must find the right choices which will enable us to develop some of the patterns that began a long time ago in history.

This is a very personal thing for me. I want to do this, for the sake of my children, for the people I know, and their children. Humanity as a concept is very abstract. My fondest hopes and dreams are personal.