Chapter 1

Introduction to Living Matter and Human Consciousness

> Scientific thought is a creation and manifestation of the genius of man. Religion, art, social and personal ethics, public life, philosophical concepts and meditation are results of similar efforts. The scientific thinking of the various nations (as well as other magnificent reflections of human personality) has changed throughout the ages. It obeys its own laws and appears in specific and comprehensible forms.
>
> [V. I. Vernadsky, 1922]

[...]

Most cosmoplanetary theories treat civilisations and their confrontations, their evolution and stages of development as merely tactical questions. They ask: In what ways and to what extent do civilisations interact? What are the principles on which agreements on the distribution of energy and mineral resources, transport and communication systems are based? How can the demographic situation be controlled? How can we prevent new forms of biological and viral terrorism, prognosticate earthquakes and control floods and catastrophes? All of these questions seem quite reasonable; in our view they are only tactical.

The strategy of the survival of humankind on this planet should be developed on the basis of **a new cosmic anthropo-ecological science**. Only such a science will provide the necessary synthesis of geopolitical, social and historical processes of human survival in the natural, planetary and cosmic environments which determine the future of the human race on the planet. Unless 'tacticians' begin to consider this new synthesis, all decisions – no matter how efficiently and beneficially intended – will be leading to a dead end.

We consider living matter and the nature of intelligence (both human and cos-

moplanetary) as a phenomenon of the Universe, and we compare the planet with a spaceship. The emergence of the first living matter (4.5-5 billion years ago) on this 'spaceship', the progression of protein-nucleic structures of prokaryotes and eukaryotes, as well as their further evolution from the simplest to the most complex of biosystems including proto-hominids, was implemented by two types of interaction—the asymmetry of molecular and field structures. Most importantly, emergence of life was realised by a combined asymmetry. Using cosmic flows some organisms reproduced and evolved as *autotrophs*: they synthesised their own bodies, i.e. their own protein-nucleic substrate, from the available inert substances such as gases, solid minerals and water compounds. Other organisms acquired a certain aggressiveness or dissymmetry of autotrophy. They began to eat autotrophic remains or living organisms. Thus, *heterotrophs* came into being as a new form of living matter. Heterotrophs can live and reproduce only by consuming accumulated organic material. The present animal world, most of bacterial, protozoan, fungal, viral and other structures are heterotrophic. The autotrophic world is a green kingdom of plants and autotrophic bacteria detailed in the early 19th century by S.N. Vinogradsky in Russia. The principal conflict of today lies in an autotrophic–heterotrophic asymmetry in terms of the assimilation of field and energy resources emitted by the sun and radiating from the cosmos (Figure 1).

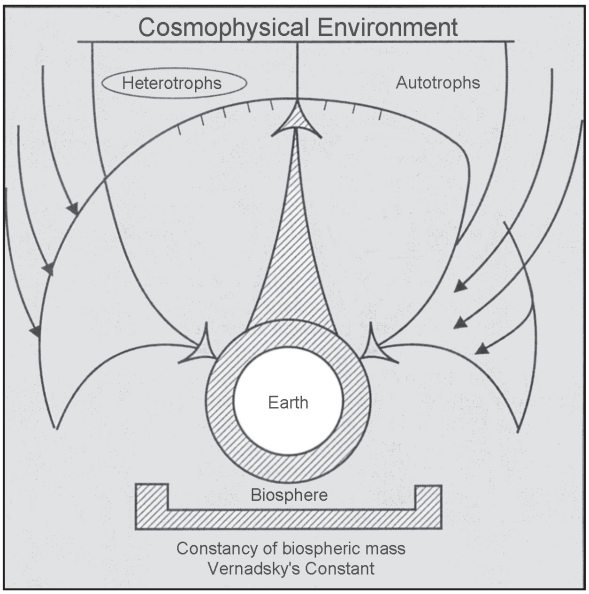

Figure 1. Balance of auto- and heterotrophic living matter at the time of its emergence on planet Earth

Using science, technology and technical facilities man reinforced some autotrophic mechanisms by an intensified utilisation of fields, animal resources, oil, gas, etc., thus increasing the autotrophy of society. But this type of autotrophy only strengthened the heterotrophy of our cosmic home. "Devouring" water, air, minerals, energy, all forms of nuclear power and other resources from the planetary envelopes, the evolution of the human race aggravated the conflict between auto- and heterotrophy of the planet (Figure 2).

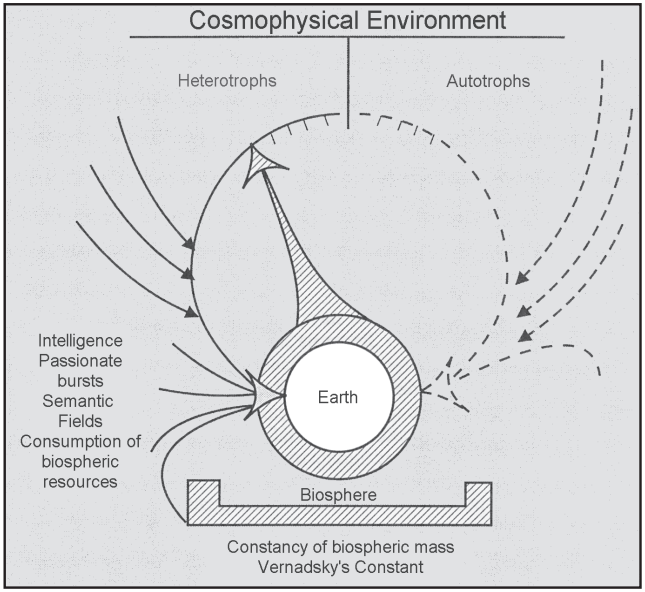

Figure 2. Imbalance of auto- and heterotrophic living matter at all stages of emergent intelligence and the technocratic advance of civilisations.

On the one hand, this conflict is characterised by an increasing "terrorism" wielded by bacteria, viruses, protozoa, fungi and other micro-organisms, which are part of the endo-biosphere. On the other hand, human heterotrophy has begun to dramatically change the cosmoplanetary environment in consuming air, water, plant and other resources. Electromagnetic, geophysical and ecological pollution triggers responses from the sun and from within the planetary system.

The dissymmetry of auto- and heterotrophy is reaching a critical point. Overpopulation – especially in the developing countries where populations will soon reach 9 to 10 billions – will not only be causing antagonisms among economies, religions and confessions, but military conflicts as well. Science and technology in such a scenario provide society with chemical, mechanical, biological and sophisticated

electromagnetic field systems of mass destruction. Therefore the prospects for the future of our planet are threatening, to say the least. If we continue to ignore programmes that could be adopted at a worldwide level, the planet will be moving toward catastrophe. To overcome these scenarios we need a scientific paradigm that will allow a global understanding of the fact that the living matter of this planet is of cosmic character and is implemented in cosmic intelligence. Only then will humanity see that its future depends on an integral strategy.

Cosmic Anthropoecology, the nature of life, Man and human consciousness as a cosmic phenomenon — such paradigms will expand the boundaries of the kind of scientific principle that was introduced by V.I. Vernadsky at the beginning of the 20th century. Our book will survey new approaches to this kind of scientific thinking.

The team at ISRICA has developed new techniques and experimental methods to study the nature of living matter and human consciousness. In our investigations we address the questions that were first raised by the Michigan Declaration in 1989 and later formulated by participants of the International INTERNET Workshop in 2001. The formulations are so explicit and precise that the authors do not wish to add further comment. We will return to these questions again and again and try to provide answers. In the following, we quote the list of questions.

1. **Is the non-living and the living matter of the planet the same, or are they two different natural geocosmic phenomena? What are their fundamental thermodynamic characteristics?**
2. **What are the time and space properties of these geocosmic phenomena on Earth, on other celestial bodies and in the Cosmos?**
3. **How must we describe the mechanisms of interaction of these geocosmic phenomena (chaos, order)? What are the dynamics of entropy and negentropy? Will current definitions of "system" and "information" be adequate for this interaction?**
4. **What is the geocosmic nature of the cell and of intelligence on Earth, on other celestial bodies and in the Cosmos? Can the hypothesis of *Anthropocosmism* be regarded as valid?**
5. **Where are the limits for human intelligence to cognise its own nature (regulations of geocosmic living matter and intelligence)?**
6. **What are the prospects of future science and technology? How must we forecast human survival and evolution in the 21st century?**
7. **How can we find ways of autotrophy for the human race?**

The most important question is that of the possibility for an observer to emerge in the course of the evolution of the universe, with the observer's function being that of self-reflection of the universe. Such a possibility for an observer to emerge should be characterised by certain biological or intellectual quantum principles similar to the quantum interactions of particles in quantum physics. This is basically different from Newton's linear physics and cosmogony, as it considers the possibility of a biological cosmo-intellectual quantum existence. Such a quantum is still unknown [N. Bohr, 1971]. Living matter possesses a 'mysterious' information potential in the so-called *Kozyrev space* where it evolves, self-reflects, and echoes the evolution of the universe and where it is reproduced by a flow that constitutes evolution itself — the *Nomogenesis* described by L.S. Berg and V.I. Vernadsky.

The concept of an intellectual living quantum (a quantum of consciousness) is still a mystery. Our research does not allow us to agree with certain synergistic concepts which identify living informational systems, life flows and intelligence as inert informational organisations similar to a mechanical engineering system of technology.

Rather, living matter is a cosmo-planetary phenomenon which should be based on a balance of autotrophic and heterotrophic life systems (according to Vernadsky's principles). At a certain stage heterotrophic matter is in balance with autotrophic matter and it is likely that Vernadsky's thesis of the constancy of the mass of biospheric living matter reflects the *degree of balance* between the autotrophic and heterotrophic domains in the biosphere (Figure 1). Over the course of evolution, the autotrophic world of plants and bacteria gives rise to heterotrophic elements which consume living organic material, that is, eat plants, insects and animals. Some may be vegetarian, others may feed on each other, but they are a source of heterotrophy on Earth. An autotrophy vector balances heterotrophy. This also concerns the macro-zoological, biospheric, and micro-worlds and their global balance.

Figure 2 illustrates a new range of intelligent life forms that emerged among the heterotrophs. At first this happened in form of generic and passionate "bursts". However, with the emergence of semantic fields these forms developed into human tribes, clans and nations. This intensified heterotrophic evolution began to consume the accumulated biospheric water, air and mineral resources causing an ecological deformation and distortion of all planetary spheres.

Hypertrophied aggressive action of human civilisations in an economic 'web' depletes the planet's resources and its biospheric envelopes (sedimentary cover, lithosphere, hydrosphere, atmosphere, magnetic fields, ionosphere, etc.). The human

tendency to heterotrophy and its lack of compensation for the autotrophic world has become threatening. Living matter and planetary intelligence came into existence as integral parts of the evolution of the universe's Intelligence. This Intelligence or Mind emerges as the observer, or Subject in the objective world of the universe in order to reflect upon its own evolution and realise new energy/information processes.

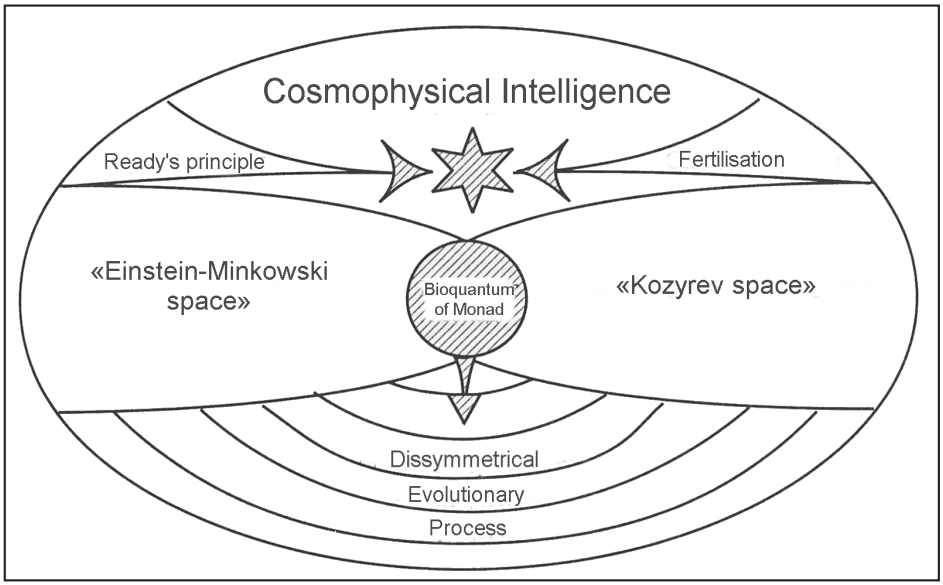

Figure 3. 'Biological quantification' providing intelligence of the dissymmetrical evolutionary process in the Einstein-Minkowski and Kozyrev spaces.

An abnormal cosmic phenomenon is taking place in our world today. Mankind's propensity for aggressive heterotrophy has the potential to destroy the historical *auto-heterotrophic balance* on Earth. Heterotrophy demolishes the autotrophic world and becomes aggressive to local, distant and super-distant cosmic space (anthropocosmism). The above statements which are open for discussion, summarise our experimental and theoretical results and delineate new problems. One of them is that in our multi-polar world the present geopolitical environment will intensify heterotrophic aggressiveness even more, securing the prosperity of a certain group of people – the so-called "golden billion"– while the rest of the planet's population is regarded as inferior. Today's concept of stable (or sustainable) development, despite some of its obvious advantages, is still a tactical model. It does not correspond with the cosmoplanetary strategy of evolution and will come to a deadlock.

We ask our readers to study all the possible evolutionary vectors in Figures 1 and 2. Can we accept the vector that transforms the human race into a robotic sphere in which human intelligence and living matter are pushed into the realm of self-organising inert, mechanical or technological structures?

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