

From Modern Civilization to the Scientific Foundation of the Ecological Civilization

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The ontological basis of civilizations and the two fundamental types of civilization: natural and modern

In the history of humanity, one may observe two fundamental types of civilization: natural and modern. The natural civilization can be characterized by the harmony between people and their world: the living world of Nature. The modern civilization can be characterized by the materialistic worldview in which Nature is conceived as inanimate matter, life and human reason are epiphenomena of matter. Consequently, life and human reason become subordinated to allegedly prior matter and are constrained to serving materialism. The natural civilization is metaphysical, religious and harmonious; the materialistic civilization is anti-metaphysical, profane and alienated. In natural societies Nature as well as life is respected as sacred and human mind has a place in the sacred order of Nature. In modernity nothing is sacred. Modernity is nihilistic. The natural civilization is based on a *comprehensive ontology* in which life, mind and matter each possesses ontological, cosmic weight. It is life-affirming and mind-affirming. Modernism is based on a total denial of meaning and purpose of human existence on earth. The natural civilization has been extremely long-living, prevailing through all times before the era of modernity. The lifetime of modern civilization extends to a few millennia. In light of this, it seems that the term 'civilization' expresses a special ontological stance. *This ontological stance has a power shaping the entire civilization to its character.* We can consider that 'civilization' is, in the first approach, a term corresponding to an ontological stance influencing a serious share of humanity during

a significant period. *Ontology is the ultimate, deepest level of thinking and so it is the determinative basis of our worldview.*

The importance of worldview for the character of civilization

It is vitally important to realize the importance of worldview. The worldview is a system of basic convictions prescribing how to experience and interpret the world. The way we experience or interpret the world has a crucial importance since all our experiences can be utilized either in favor of life or material interests. It is the worldview that determines which questions are important and how to answer them. *What we call thinking is generally the unconscious application of our pre-existing worldview.* The worldview is fundamental in our life as well as in science, usually without being aware of doing so. The unconscious usage of the worldview is one of the main causes why its fundamental significance is so frequently overlooked. *It is the worldview that determines the way we understand science.* This means that *the worldview has a primary significance in our life, science and society.* Worldview is more fundamental and therefore more significant than science itself.

The importance of science for the character of civilization

The next level in shaping our thinking is science itself. Modern science has become the most powerful basis and tool of materialism. Science has a fundamental significance in education as well. Until one has not other possibility but teach a curriculum based on materialistic science, the schools will produce people conforming to the materialistic viewpoints. *If the ecological worldview misses a similarly powerful scientific background to that of modernism, it cannot excel Western civilization.* In modernism, living organisms are considered as nothing else but complex machines. *I think that the most needed ingredient for creating a viable ecological civilization is a comprehensive science of all Nature,*

completing the science of matter with the new sciences of life and mind. This task requires, besides the science of matter, a new biology shedding full light to the nature of life and a new psychology shedding full light to the nature of mind, both similarly well-grounded but definitely not subordinated to physics. The problem is now: how to find the suitable ground for a life-affirming biology and mind-affirming psychology?

The most powerful tool of physics is its first principle

The solution of this problem requires us to recognize that the most powerful tool of modern physics is *the least action principle*. Since practically all the fundamental laws of physics can be derived from the least action principle, therefore it can be regarded as the first principle of physics. The life-affirming biology can have similarly profound impact only if it has its own, similarly powerful first principle.

The most powerful tools of civilizations are the first principles

It is vital to realize the fundamental significance of the first principles for the ecological civilization. Finding the first principles has been always one of the greatest tasks of philosophy. The goal of science is the formulation of comprehensive principles that summarize disparate phenomena in the most general possible way. By the term 'first principle' I mean an ontological principle from which all the fundamental laws of the science corresponding to the given ontological domain can be mathematically derived. The first principles are the most powerful tools of science, worldview and ontology. Therefore, *the first principles are the most powerful tools of civilizations.*

The first principle of biology is more general than that of physics

Eugene Wigner, the Hungarian-born Nobel laureate physicist, one of the fathers of quantum theory already suggested that biology is a more general science that includes in itself physics as a special subclass¹. Similarly, one of the fathers of theoretical biology, Hungarian-born Ludwig von Bertalanffy expressed his hope that “the attempt will be made to extend principles like that of least action” into biology². In this talk I indicate how I succeeded to generalize the least action principle of physics and extend it to biology, allowing the endpoint of its integral to be selected according to biological aims³. It is in this way that I obtained the first principle of biology because the mathematical form of the extended action principle is identical with that of *Bauer’s principle*⁴, which is the universal principle of all living organisms. Ervin Bauer, the Hungarian-born founder of the most promising version of theoretical biology, has been able to derive the mathematical equations of metabolism, growth and all the fundamental life phenomena from this principle⁵. Being more general than the physical principle, the biological principle permeates the entire Universe, including the quantum-vacuum and cosmic space⁶.

Priority of life over matter

There is a remarkable logic between the connection of biology to physics: the first step is the biological selection of the endpoint for the biological principle. Once the endpoint is fixed as a first step, the first principle of physics applies and it realizes the biological aim in the most economic way possible, as a second step. This extension of the least action principle into biology is the crucial step that gives life

¹ Wigner EP. Are we machines? Proc of the Amer Phil Soc 1969; 113: 95-101; Wigner EP. Physics and Explanations of Life. Foundations of Physics 1970; 1: 35-45.

² Bertalanffy, L. von 1952, Problems of Life, Watts & Co., London, 1952; 201.

³ Grandpierre A. 2007a, Biological Extension of the Action Principle: Endpoint Determination beyond the Quantum Level and the Ultimate Physical Roots of Consciousness, Neuroquantology, 5: 346-362.

⁴ Grandpierre, A. 2014, Biologically Organized Quantum Vacuum and the Cosmic Origin of Cellular Life. Analecta Husserliana, 116, 107-133; Grandpierre, A., Chopra, D. and Kafatos, M. 2014d, The Universal Principle of Biology: Determinism, Quantum Physics and Spontaneity. NeuroQuantology 12: 364-373.

⁵ Bauer, Ervin. Elméleti biológia (Theoretical Biology, in Hungarian, 1967). Akadémiai Kiadó, Budapest, Russian Theoreticheskaya Biologiya, 1935. English translation is in preparation.

⁶ Grandpierre, A. 2017b. The Fundamental Biofriendly Activity of the Universe. Analecta Husserliana (in print).

priority over matter in the entire Universe. This move elevates life to be the most fundamental aspect of all existence as well as to show that we live in a Living Universe⁷.

The biological principle: Bauer's principle and life's values: beauty and goodness

We have to note that the biological principle is already exactly given and answers exactly the famous question: what is life? *Bauer's principle tells that "the living and only the living systems are never in equilibrium; they unceasingly invest work on the debit of their free energy budget against that equilibration which should occur for the given the initial conditions of the system on the basis of the physico-chemical laws"*⁸. This means that *life is a motivating power*, much different from rigid mechanical survival and preprogrammed reproduction. Instead, life is first of all an uplifting power motivating all living beings towards living life fully and actively, mobilizing all their physical, biological and psychological energies and transforming them to make life as full as possible. *The life principle motivates all living beings towards the heights of life*. Life is, by its very nature, first of all a cosmic principle, carrying in itself the highest beauty, goodness and truth, the majesty and eternal victory of the life of Nature, the extraordinary life of the Universe. With the new biology based on the life principle, value enters into science. There is no difference for a cannonball between the different directions of its trajectory. In contrast, for a living being, its actions can make a big difference, because there are conditions that are helpful and conditions that are harmful for life. From all the values, life is the highest and primary value, without which no other value could exist. We can define goodness as the moral property of activities helping, improving and perfecting life. Since it belongs to the nature of life to preserve, defend and support life, the biological principle mobilizing all energies towards the heights

⁷ Grandpierre, A. 2002, Az Élő Világegyetem könyve (The Book of the Living Universe, in Hungarian). Válasz Könyvkiadó, Budapest; Grandpierre, A. 2012, Az élő Világegyetem könyve – 2012 (The Book of the Living Universe. 2nd, thoroughly rewritten version of the one published in 2002, in Hungarian.) Titokfejtő Könyvkiadó; Grandpierre, A. 2017, Living Universe Through the Eyes of a Solar Physicist. The Scientific Foundations of the Ecological Society (book manuscript, transl. to English, submitted).

⁸ Bauer, Ervin. Elméleti biológia (Theoretical Biology, in Hungarian, 1967, 51). Akadémiai Kiadó, Budapest, Russian Theoreticheskaya Biologiya, 1935. English translation is in preparation.

of life can be regarded as the objective basis of goodness. The biological principle, especially the inborn love of life present in all living beings can be regarded as the universal basis for the moral behavior.

The importance of biological autonomy and the origin of consciousness

Recently the scientific theory of genuine *biological autonomy* has become available, indicating that *the bridge between the material and non-material world is decision making by free will*⁹. Since the selection of the endpoint of the action integral must be determined by the living organism itself, and the selection requires decision making that requires a kind of consciousness, the biological principle is inseparable from consciousness. *Mind is the tool of life to select the biologically optimal endpoint for the biological principle*. The fundamental principle of mental activity is logic suitable to find the optimal conditions for life, including individual perspectives as well as that of the species and the biosphere, ultimately the ecological community of all life. The universal axioms of logic like the axiom of noncontradiction can be derived from the life principle as a basic norm of conscious activity.

The ultimate Trinity of life, mind and matter

In this way, all the three first principles of the Universe are found to be unified in the unity of cosmic life and cosmic mind, as they must, since the Universe is a unified whole. We are led to recognize the ultimate Trinity in the three first principles of the Universe, that of life, mind and matter. The comprehensive, all-encompassing science offers a broader, more balanced and deeper worldview than

⁹ Grandpierre, A. 2012, Genuine Biological Autonomy: How can the Spooky Finger of Mind Play on the Physical Keyboard of the Brain? Athens: ATINER'S Conference Paper Series, No: PHI2012-0197. <http://www.atiner.gr/papers/PHI2012-0197.pdf>; Grandpierre, A. and Kafatos, M. 2012, Biological Autonomy. *Philosophy Study* 2(9): 631-649; Grandpierre, A., Kafatos, M. 2013. Genuine Biological Autonomy: How can the Spooky Finger of Mind Play on the Physical Keyboard of the Brain? Chapter 9, *An Anthology of Philosophical Studies*, Vol. 7, P. Hanna (edit.), Athens Institute for Education and Research 2013, pp. 83-98.

that of modernity. The comprehensive science presents a fundamental achievement surmounting that of modern science.

The natural way of human life and civilization

Humanity is the manifestation of the life- and mind-creating ability of the Universe. The natural way of human life is to join to this cosmic way and contribute to the flourishing of Nature, uplifting life and mind. Following this natural direction of human evolution, *the natural task of the mind is to serve life's highest potentials*. All knowledge should serve life in the best way possible. This natural way of humanity has changed only a few thousand years ago with the advent of modernity. Pushing the first principles of life and mind into the background and neglect, materialism restricts mind to serve not life but matter. When a civilization accepts materialism, time jumps out of joint, and people become alienated.

The ecological science and constructive postmodernism

In our 21st century, modernity is losing its attractive power, and postmodernism comes to the fore. Among the postmodern philosophies the one directed towards the natural way of harmony, health, and biophilia is *constructive postmodernism*, built on the process philosophy of Alfred North Whitehead by John B. Cobb¹⁰, David Ray Griffin¹¹ and many others. They suggest that in order to create an ecological

¹⁰ Cobb, J. B. 2015, Foundations for a New Civilization, <http://www.jesusjazzbuddhism.org/foundations-for-a-new-civilization.html>

¹¹ Griffin, D. R. 2007, Whitehead's Radically Different Postmodern Philosophy - An Argument for Its Contemporary Relevance (S U N Y Series in Philosophy); Griffin, D. R. Panentheism and Scientific Naturalism. Process Century Press, Claremont, CA (2014): 123.

civilization a philosophy is needed. Complementing their achievements, I propose to develop such an ecological science that unifies the sciences of matter, life and mind, i.e. the comprehensive science.

Human life and mind relies on cosmic grounds

The above-indicated comprehensive science sheds new light to human nature. If life and mind have their own first principles, then *human life and mind rely on cosmic grounds*. Moreover, this cosmic ground is common in all of us, *joining all living beings into a cosmic community of all life*. The first principles are creative principles because life and mind are creative by their very nature. The biological principle is the basis of the thirst and love of life, i.e. biophilia, and the mind principle is the basis of the thirst for knowledge and the love of truth. The life principle motivates us to live our life fully on the basis of love of life; the mind principle motivates us to mobilize our mental capacities fully, to think and act on the basis of natural logic that involves beyond formal logic intuition as well.

The all-comprehensive science and the essentially complete scientific worldview

This all-comprehensive science based on the first principles of the Universe offers the first essentially complete scientific worldview. The essentially complete worldview is balanced and healthy. Since the scientific worldview is used as the ultimate basis of our decisions in our everyday life, the healthy worldview of the comprehensive science can serve as the most powerful tool in building up a healthy, ecological society. Since the life principle drives life towards the highest beauty, the healthy society is driven towards creating beauty in social activities as well.

The ultimate significance of living in a civilization

No worldview can deny the basic fact: human beings live in the world. The stage on which we experience our life is the world. Our mind has the natural task to help our life in the world, to indicate us what to do in order that our life becomes better. We have to act in the material world with the help of our psyche and intellect. We as human beings are transformers transforming the psyche and intellect into material actions. This means we are ontological transformers securing traffic between different ontological domains. The mode in which we realize this ontological transformation is determined by our civilization. By the term 'civilization' we mean the ontological stance determining the basic attitude of humanity to the ultimate essences of the Universe.

Fundamental biological activity of the Universe

Continuing four-decade research program on the origin and nature of solar activity, we found that solar activity is not a mere occurrence but a genuine activity of the Sun, initiated from the global level by the Sun using quantum processes as tools in a special way generating suitable primary mass flows locally in the solar core that are capable to produce a working dynamo. The Helios theory argues that solar activity is initiated by biological causes existing beyond the gigantic system of physical causes¹². We point out that recent results of the Astrobiological Revolution indicate the generation of complex organic molecules preferentially favorable for life in experiments and in the Universe even within apparently 'impossible' physical conditions present in extremely rare and cold cosmic clouds. The biological principle offers explanation for the already introduced idea of 'biological determinism' and the idea generally accepted by astrobiologists that life is a 'cosmic imperative'. The universal prevalence of the biological principle in the Universe involves a continuous activity towards creating conditions favorable

¹² Grandpierre, A. 2017c, The Helios Theory – The Sun as a Self-Regulating System and as a Cosmic Living Organism (to be published in Process Studies)

for more and more complex life forms. This is what we call as the fundamental biological activity of the Universe prevailing everywhere in the vast cosmic space as well as in ourselves¹³. In an organic Universe permeated by life and intelligence, human mind permeated by cosmic life and intelligence together are capable to understand the world. This means that we are capable to shape a civilization serving the way of the Homo sapiens to secure a home for the cosmic life and intelligence in our own life. Humanity is capable to form a suitable ontological stance for a viable civilization living in harmony with both humanity and Nature, simultaneously.

On the crisis of modernity

Modernity loses its attractive power. Nowadays investing more effort and time for work usually does not result in more happiness. Instead, diseases of modern civilization are becoming increasingly powerful. As Ernst F. Schumacher has pointed out¹⁴: „All history - as well as all current experience - points to the fact that it is man, not nature, who provides the primary resource: that the key factor of all economic development comes out of the mind of man.” The fact that chronic and mental diseases dominates the Westernized world in an increasing rate indicate that the basic resource of modern civilization, i.e. human mind, is shifted into the zone of vital danger. The root cause of the spread of mental and lifestyle diseases seems to be modern education alienating our mind from our genuine task to live in harmony with each other and Nature and contribute to the flourishing of life and intelligence. “If western civilization is in a state of permanent crisis, it is not far-fetched to suggest that there may be something wrong with its education. The task of education would be, first and foremost, the transmission of ideas of value, of what to do with our lives”¹⁵.

¹³ Grandpierre, A. 2017c, The Helios Theory – The Sun as a Self-Regulating System and as a Cosmic Living Organism (to be published in Process Studies)

¹⁴ Schumacher, E. 1973, Small Is Beautiful: A Study of Economics As If People Mattered. Blond & Briggs, 62-63.

¹⁵ Ibid.

Modernity and the end of hegemony of unilateral science

Modern science had become unilateral and imperialistic when intending to exclude any future science beyond physics. Modern science plays also the role of dogmatic philosophy and religion. People believe in science and atheism without understanding it. The clarification of physics on the basis of first principles makes it possible that practically everybody could understand the difference between physics and biology. We think that the development of science cannot be arrested forever. After the development of classical physics of macroscopic bodies the quantum world had been discovered with its own, more general laws than that of classic physics. We had shown that there is life beyond the quantum level of Nature¹⁶. It is inevitable that after the development of the first exact science, physics, the second exact science, biology, develops, a subquantum biology having its own first principle securing its independence from the “imperialism” of physics.

Meaningful goals and the ecological civilization

We point out that the ultimate resource of humanity is present in the human mind in the form of the creative first principles of the Living Universe. First of all, it is the life principle that drives our mind toward its full potential for beauty, goodness and truth, the natural goals of life. The materialistic modern worldview does not respect life as the primary value of the Universe. Regarding the modern view that the ‘universe’ is without any value, nihilism arises inevitably. Nihilism, the absence of worthwhile values and goals is one of the primary causes why humans suffer, and become confused, mentally and physically ill. “What man actually needs is not a tensionless state but rather the striving

¹⁶ Grandpierre A. 2007a, Biological Extension of the Action Principle: Endpoint Determination beyond the Quantum Level and the Ultimate Physical Roots of Consciousness, *Neuroquantology*, 5: 346-362; Grandpierre, A. 2012a, Genuine Biological Autonomy: How can the Spooky Finger of Mind Play on the Physical Keyboard of the Brain? Athens: ATINER'S Conference Paper Series, No: PHI2012-0197. <http://www.atiner.gr/papers/PHI2012-0197.pdf>; Grandpierre, A. 2014, Biologically Organized Quantum Vacuum and the Cosmic Origin of Cellular Life. *Analecta Husserliana*, 116, 107-133. Grandpierre, A., Chopra, D. and Kafatos, M. 2014d, The Universal Principle of Biology: Determinism, Quantum Physics and Spontaneity. *NeuroQuantology* 12: 364-373.

and struggling for a worthwhile goal, a freely chosen task” – writes Viktor E. Frankl¹⁷ (1992). A meaningful goal can mobilize our human potentials and restructure our whole life, offering us the possibility to develop an uplifting way of life. The human potential is like a gigantic universe of inner life, the ocean of unnoticed ideas, galvanizing emotions and urging talents driven by cosmic creative principles, instincts urging us to live our life fully, hunches which remains unattended and unnoticed until the arrival of worthwhile, inspiring goals making our life meaningful. Life is itself the unified system of meaningful goals, the source of any activity and self-regulation.

Economics depends on our ideas about the meaning of life

As Schumacher has pointed out, economics change as the underlying picture of man and his purpose on earth changes¹⁸. Accepting the natural goals of life and develop an organic civilization of ecological communities has an enormous advantage over modernity by mobilizing the deep human resources that are exploited or depressed by modernism.

The essentially complete worldview as a cure for the schisms of modern civilization

This essentially complete worldview can serve as the cure for the split between mind and soul, as well as between science and religion, Nature and society, or the division between the sciences and the humanities. The comprehensive science and its healthy worldview can be useful in complementing constructive postmodernism by a powerful, exact and transparent science. Remarkably, among the three first principles of matter, life and self-consciousness, the most fundamental one is that of life¹⁹. Our

¹⁷ Frankl, V. E. 1992, *Man's Search for Meaning*. Beacon Press, Boston, p.111.

¹⁸ Schumacher, E. 1973, *Small Is Beautiful: A Study of Economics As If People Mattered*. Blond & Briggs, 46-47.

¹⁹ Grandpierre, A. 2002, *Az Élő Világegyetem könyve* (The Book of the Living Universe, in Hungarian). Válasz Könyvkiadó, Budapest; Grandpierre, A. 2012, *Az élő Világegyetem könyve – 2012* (The Book of the Living Universe. 2nd, thoroughly rewritten version of the one published in 2002, in Hungarian.) Titokfejtő Könyvkiadó; Grandpierre, A. 2017,

result seems to show fundamental similarities to the ancient Eurasian philosophy along the Silk Road, from which Chinese culture has preserved the most complete written documents. In Chinese philosophy, ‘Qi’ or ‘ch’i’ is the vital force of which everything is composed, “the ultimate foundation for the existence of the universe”...the “ontological source of the universe”²⁰. In Chinese philosophy, ‘Qi’ or ‘c’hi’ is the ethereal substance of which everything is composed. Early Daoist philosophers regarded it as a vital force. De Groot calls the ancient Chinese system of metaphysics “universism”, which is the basis of the entire Chinese philosophy²¹. “All Chinese traditions converge on one essential point: they all hold that the Universe represents an all-comprehensive Urge of Life, an all-pervading Vital Impetus, that never for a single instant ceases to create and procreate and never in a single place ceases to overflow and interpenetrate”²². The comprehensive organic worldview connects the ‘ch’i’ with the most powerful principle of science and the Universe: the cosmic life principle that makes it possible to achieve harmony between individuals, humanity, and the cosmic community of all living beings. The comprehensive scientific worldview shows unexpected similarities with process philosophy and ancient Chinese philosophy, including, among others, *change, creativity, life principle as the most fundamental principle of the Universe, goodness, and comprehensive harmony*.

Curriculum for the schools of ecological civilization

If western civilization is in a state of permanent crisis, it is not far-fetched to suggest that there may be something wrong with its education. We hope that with this all-comprehensive science based on the first principles of the Universe is suitable to indicate for the open-minded reader that the essentially complete

Living Universe Through the Eyes of a Solar Physicist. The Scientific Foundations of the Ecological Society (book manuscript, transl. to English, submitted).

²⁰ Zhenyu Zeng. “Semantic criticism: The “westernization” of the concepts in ancient Chinese philosophy—A discussion of Yan Fu’s theory of Qi.” *Journal Article Frontiers of Philosophy in China* 6(2011): 100-113.

²¹ De Groot, J. J. M. *The Religious Sytem of China*. Taipei, China: Southern Materials Center, Inc. 1912/1982, Vol. VI, Book II, 1187; Glasenapp, Hugo von. *Az öt világvallás*. Gondolat, Budapest (in Hungarian, 1975, transl. from the original German *Die fünf Weltreligionen*, Eugen Diederichs Verlag Düsseldorf – Köln, 1972), 141.

²² Fang, Thomé H. *The Chinese View of Life: The Philosophy of Comprehensive Harmony*. Yaipai: Linking Publ., 1980: 33; cited by Chenyang Li. “Fang Dongmei: Philosophy of Life, Creativity, and Inclusiveness.” In: Chung-Ying Cheng, Nicholas Bunnin (eds.) *Contemporary Chinese Philosophy*, 2008, 270.

scientific worldview has become available. Until now, there has been no alternative to the materialistic modern science in the education system. The exact all-comprehensive, animistic and holistic science could be the key for a balanced curriculum for the schools of the ecological civilization.