

The Significance of Biological Research in Space for the Development of a Unified Field Theory

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In this report, we would like to point out some additional biological research areas which will only be opened up by an adopted mission of long-distance, short duration, manned space flight. This research will answer fundamental questions for life on Earth, questions which are not subject to being addressed under conditions found on Earth, but which will be crucial to addressing certain crucial questions in:

1) Developmental Biology 2) Evolutionary Biology 3) Cancer and Infectious Diseases

While many people would argue that questions of evolutionary biology cannot be “crucial” – that is, that they have no applications, and are of interest only to specialists – this report will disagree, and discuss the profound importance of this area of research, as well as its applications in the form of technology.

1 Developmental Biology

There has been much discussion in recent decades – much of it fear mongering – about the role of electromagnetic fields and radiation in the developmental process. Too much of this has focused on rather anti-technology concerns: “Do cell phones and power lines cause cancer?” “Do electromagnetic fields damage DNA?” Very little research has focused on the productive, regulatory role of such electromagnetic phenomena. We will be generous, and assume that this is not due to disinterest, but rather due to a desire to focus on more sensationalist elements of the research in order to engage what is perceived as a disinterested, unscientific public. Whatever the cause for this lack of attention, the truth is that very little work has been done in this area since the pioneering work of A. G. Gurvich and his students.¹ Interesting questions are:

1) Do electromagnetic affects play a constructive, regulatory role in growth and development? Popp has achieved results which point to a positive answer to this question.²

¹Notable exceptions are Lev Belousov, Fritz Popp, Frank A. Brown, etc.

²Popp’s website and papers can be found here: <http://www.lifescientists.de/>

2) What role does the Earth's magnetic field play in daily regulation of biological function? In particular, the regulation of bone and muscle mass?

3) As far as we know, electromagnetic phenomena do not occur in the absence of gravitational phenomena, and may in fact be two aspects of one single phenomenon. What does that imply for the deteriorative effects of microgravity on living organisms, outside of simple "unloading" effects?

This last question points to the possibility of living processes playing a very unique role in the establishment of a unified field theory. In fact, we would argue that a true unified field theory *cannot be approached without viewing the question from the standpoint of living matter*. Vladimir Vernadsky identified the existence of the three distinct, but interacting phase spaces of the non-living, living, and the cognitive³ – through each of which there is a continuous flow of matter, which he termed the biogenic migration of atoms.⁴ Could life be sensitive to more than just the accelerative effects of gravitation? The inability to establish a null, or negligible gravitational field on Earth prevents the definitive answer to this question. The important research which must be done, which could mean a major breakthrough in the field of physics, derived from a recognition of the uniqueness of biological processes, could only be done under the conditions of extended animal experimentation in space. In particular, we would want to examine the effects on animals of existing in an "artificial gravity" environment of *one Earth gravity acceleration*, in the absence of the magnetic field of the Earth, in order to cancel out the mechanical effects of gravity as an experimental variable – focusing solely on the electromagnetic environment.

The technological spill-over from this sort of investigation includes, but is not limited to:

- 1) New methods for the electromagnetic control of developmental processes.
- 2) Application in controlling the replication of cancerous cells.
- 3) Electromagnetic manipulation of gene expression.

2 Evolutionary Biology

Moreover, the astrobiology research group at the University of Kansas⁵ has shown that the historical cycles of biodiversity on our planet correspond very closely to astronomical cycles. The extinction of old species, and the development of new ones, ever increasing in their complexity, and culminating with the profound creative force that is the human individual – the process which we call evolution – is governed by much more than the simplistic model of "natural selection" presented by Darwin. What role do cosmic rays, and the electromagnetic environment of the Earth and our Solar System play in the emergence of

³The domains of the two higher forms of matter he termed the Biosphere and Noosphere, respectively.

⁴In animals this takes the form of respiration and digestive-excretory processes. Vernadsky V, *The Biosphere*, 1998, Copernicus (New York). English translation.

⁵The University of Kansas Astrobiophysics website is here: <http://kusmos.phsx.ku.edu/~melott/Astrobiology.htm>

not just new species, but entirely new biogeochemical environments? Most researchers in this area have, again, limited their investigation to the destructive effects of these radiations, but the evidence (the increasing complexity of the biosphere over evolutionary timescales) points to a more constructive role for these astronomical cycles. Where are we to find the controlled environment to perform the proper experiments to determine what this effect might be? This will require moving living organisms away from Earth's surface, and rearing them for several generations under diverse extraterrestrial conditions. The possible applications of the result of this research are enormous, and would represent nothing short of the conscious control, by man, of evolutionary development.

3 Cancer and Infectious Diseases

The role in cancer research of animal research in space has been hinted at already. But what about the possible control of viral and bacterial diseases? We know already that certain viral epidemics obey seasonal and other astronomical cycles. (Flu, Norovirus, etc.) While factors such as humidity have been introduced to explain the seasonal fluctuation of virulence in these diseases, it does not account for the other cyclic diseases, and certainly does not account for the regular transformation in the genomic character of these pathogens. Does something about the electromagnetic environment of the Earth and our Solar System contribute to evolution and virulence of disease agents? If this can be discovered, would there be any limit to our ability to control the spread and behavior of these diseases? Might we even be able to use these agents effectively to our benefit, instead of them being the scourge they represent today? Attention should be also be directed here to the now recognized role of viruses in animal evolution. (Louis P. Villarreal, Frank Ryan, etc.) The only proposed model includes the implausible and unlikely presumption of viral particles "acting in their own self-interest." What if they are acting in the interest of a higher process, driven by electromagnetic-gravitational phenomena? What would that say about our ability to ultimately direct their behavior?

4 More on Gravitation: The Physical Space-Time of Living Organisms

The work of Vladimir Vernadsky at the end of his life pointed to the different character of the phenomena we call "space" and "time" within living processes. I.e., the physical space-time of living organisms is distinct in its expression from that found elsewhere.⁶ This, he found reflected in several characteristics of living matter:

⁶For more on this, see Vernadsky V, On The States of Physical Space, *21st Century Science and Technology Magazine*, English translation., http://www.21stcenturysciencetech.com/Articles%202008/States_of_Space.pdf and

1) The possibility, and even predominance, of regular five fold symmetries, which are otherwise impossible to maintain in the euclidean space of non-living geometries.

2) The distinct character, first noted by Pasteur, of chiral enantiomers of organic molecules within living processes, despite the fact that these are chemically identical in the space of non-living geometries.⁷

3) The different rate of development of living versus non-living processes. Non-living processes are relatively constant in the course of biological, even evolutionary time. The possible exception here are certain processes of radioactive decay.

4) The seeming discrete, cyclical character of time in living processes. This is expressed in the alternation of generations, a modular character which is absent in non-living processes.

5) The direction of time in living processes

6) The possibility for willful motion of the individual organism, which is absent in non-living processes.

Now, the phenomenon of gravitation has been identified, by Einstein, with changes in the expression of physical space-time. What does that say about the possible relationship of life to gravitational phenomena? What would observing the behavior of life in gravitational environments other than our own tell us about the nature of life itself?

5 Concluding Thoughts

Certain phenomena which have been postulated here, would also imply electromagnetic and radiative environment for the Earth, which is highly structured in both space and time. Indications of this structure have been seen from recent observations of the solar wind interaction with the magnetic field of the Earth as well as extra-galactic cosmic rays. An interplanetary magnetic field, however, which is complex and intricate enough to aid in processes like evolution, would be difficult to image even with the use of something like the ESA Cluster satellites, or the planned NASA MMF mission. The granularity of such space-time images is simply not fine enough to account for the necessary constructive interaction proposed on a cellular level. An improved image could be obtained by beginning with living processes – where our historical-planetary picture is much clearer – and working downwards to the abiotic. We would be abandoning, at least in scientific practice, any idea that the properties of living matter can be explained by currently know properties of non-living matter. In this way, and

Vernadsky V, Problems of Biogeochemistry II, *21st Century Science and Technology Magazine*, English translation.

<http://www.21stcenturysciencetech.com/articles/ProblemsBiogeochemistry.pdf>

In these two documents, Vernadsky argues the necessity of using Riemannian geometry to describe the physical space-time of living processes. What is presented in this paper is only a tiny fragment of his full argument.

⁷The notable exception to this is that these enantiomers can be distinguished outside of living processes by light – i.e., electromagnetic phenomena.

only in this way, will we be able to answer currently unknown, fundamental questions about non-living matter. Biology must, and will, inform physics here, and not vice-versa.

6 The Need for a Manned Mission

The impetus for answering these questions will not, however, come from the piecemeal funding of individual experiments. Rather, an Apollo-style science-driver is needed, to push the necessity for these investigations into the forefront, and to provide the adequate level of technological investment, and interdisciplinary attention necessary to carry out these studies. The ideal goal, is that of placing human beings on a trajectory to Mars, under a sustained acceleration of one Earth gravity, and creating the conditions for their sustained survival on that planet, for the purpose of research and, ultimately colonization. The above-mentioned investigations will all be necessary for achieving this goal, and will be impossible without it. The value of the spill-over effects detailed above, which can be anticipated from undertaking this goal, is incalculable – what can we say about that inevitable technological spill-over which we have not been able to anticipate? We have the technological spill-over effects of Apollo as a precedent; however, the questions at stake in further manned missions, as described above, are of a much more fundamental nature, and point to more profound economic and technological spill-over. This brings us to the domain of economics and policy – the organization of human society.⁸ It must be recognized that all paths to further economic and technological development for the human species are necessarily through the colonization of space. There is no other means to the scientific goals described above. The human species, beginning with the American population, must be educated with the understanding that the various steps toward becoming a space-faring species – the industrialization of the Moon, the colonization of Mars, etc. – are not optional ones. The problems we face here on Earth – disease, lack of development, poverty, etc. – are not local ones. The fundamental scientific breakthroughs required to address these problems lie, along with the answer to their origins, in the stars.

In this way, the higher, science of human creativity – the domain of human cognition – must inform the direction of biological research. Economics as a science, not the statistical monetarism of free trade, must begin to inform policy, and not vice-versa.

⁸‘The LaRouche Plan:’ Rescuing the World’s Economy.
http://www.larouchepub.com/eiw/public/2009/2009_40-49/2009-40/pdf/04-31_3640.pdf
Of particular note is section II: “Victory Is Awaiting You On Mars.”