

Yet Another Change Is Needed

Perhaps the most popular word during the recent presidential election campaign was “change.” However, one necessary change was never mentioned: the stagnation of American (fundamental) science. I use the phrase “stagnation of science” since it is a subject of the ongoing discussion among members of one of the rebellious scientific groups—the Society of Scientific Exploration (<http://tech.groups.yahoo.com/group/SSE/>).

The American academic community supported by government agencies has dogmatized the current scientific paradigm in a fashion similar to the way that religions protect their dogmas. I am not talking about technology that applies existing knowledge to useful ends, resulting in substantial progress. Progress in science is about discovering the yet-unknown, about things that do not necessarily promise immediate economic benefit but potentially could improve the human condition.

I edited and published the book *LIFE and MIND—in Search of the Physical Basis* (MISAHA/Trafford Publishing, 2007; see <http://www.misaha.com>). It is a collection of 12 articles written by scientists from four countries, written for scientists. The book presents the 100-year-long history of the epigenetic (biofield) control system of the organism and postulates its structure. It also presents reports on four experimental studies shedding light on the physical carrier of the latter. Five physicists suggest their alternative physical models that might incorporate the phenomenon of life. Needless to say, all of the peer-reviewed scientific journals that we contacted after publishing refused to review or even mention the book—it challenges the dogmatized paradigm that is threatening the stability of the entire scientific community funded by the U.S. government. Following are some examples.

Current nuclear physics cannot explain room-temperature biological nuclear reactions discovered in agricultural studies in the middle of the 19th century and presented during the 1960s to 1980s by French scholar Louis Kervran. A study funded by U.S. Army Mobility Equipment Research and Development Command, Fort Belvoir, Virginia, in the 1970s confirmed the phenomenon (http://www.papimi.gr/biological_transmutations.htm), but the Army couldn't make use of it and discontinued funding. In our book, a group of scientists from Moscow University and Kiev University also confirmed the phenomenon in a methodologically impeccable way, showing that bacterial cultures growing in an iron-deficient medium synthesize two isotopes of iron, Fe⁵⁷, and Fe⁵⁴. No peer-reviewed American scientific journal would publish any reference to the works of Kervran and others because billions of dollars had been spent on building more and more expensive accelerators and colliders.

Current physics cannot explain the memory of water manifested in homeopathy. The late French biologist, J. Benveniste, studied this phenomenon starting in the 1970s. In 1988, the journal *Nature* (with a page of apologies) published results of his study because they had been confirmed by a number of other laboratories. Biomedical application of homeopathy would challenge the pharmaceutical industry, but accumulating experimental data in this field is important because it will bring us closer to understanding the physical basis of life, the control system of the organism. The Institute of Biochemical Physics of the Russian Academy of Sciences has been studying the effect of homeopathic concentrations of biologically active substances on living organisms, colonies, and cells for 20 years. Their article in our book refers to 196 original scientific

studies in the field. Well, if it is not explainable by contemporary physics, better not to touch it? Unfortunately, that seems to be the outcome thus far, and I think that needs to change.

It comes to mind that the above-mentioned Russian studies became possible because, during the 1990s, the Russian Academy of Sciences lost its function of distributing government funds—the government didn't have money. The “inquisition” slowed down for a while and this opened the gate for real science. Isn't this a good lesson from which to learn?

A potential ray of hope for progress emerged recently. On September 29, 2008, the National Institutes of Health (NIH) announced a new epigenomics initiative (<http://www.nih.gov/news/health/sep2008/od-29.htm>). Here is a brief description:

The National Institutes of Health (NIH) announces funding for the new NIH Roadmap Epigenomics Program. Epigenetic processes control normal growth and development, and epigenomics is a study of epigenetic processes at a genome-wide scale. The NIH will invest more than \$190 million over the next five years to accelerate this emerging field of biomedical research. The first grants will total approximately \$18 million in 2008.

The overall hypothesis of the NIH Roadmap Epigenomics Program is that the origins of health and susceptibility to disease are, in part, the result of epigenetic regulation of the genetic blueprint. Researchers believe that understanding how and when epigenetic processes control genes during different stages of development and throughout life will lead to more effective ways to prevent and treat disease. Epigenetic processes,

such as modifications to DNA-associated proteins called histones, control genetic activity by changing the three-dimensional structure of chromosomes. This can affect gene expression as profoundly as changes in the DNA sequence.

“Epigenomics-based research is now a central issue in biology [emphasis added]. We will build upon our new knowledge of the human genome and move towards a deeper understanding of how DNA information is dynamically regulated through DNA histone modifications as well as the emerging role of micro RNAs and other factors,” said NIH Director Elias A. Zerhouni, M.D. “The grants now funded through this program will provide reference data that the entire community can use to understand epigenetic regulation and how it affects health and disease.”

Diet and exposure to environmental chemicals throughout all stages of human development, among other factors, can cause epigenetic changes that may turn on or turn off certain genes. Changes in the regulation of genes could make people more or less susceptible to developing a disease later in life. (See scientific illustration of how epigenetic mechanisms can affect health at <http://nihroadmap.nih.gov/epigenomics/epigeneticmechanisms.asp>.)

The Epigenome Program promises to uncover the fundamental processes

that make a liver cell different from a muscle cell or a brain cell. Understanding these processes has far-reaching implications, from reprogramming of adult cells to treat disease to learning how environmental exposures during pregnancy increase a child’s risk of developing chronic diseases, such as diabetes and cardiovascular disease, said Griffin P. Rodgers, M.D., director of the National Institute of Diabetes and Digestive and Kidney Diseases.

The NIH initiative is invaluable—it forestalled my expectation by years. Ignoring the epigenetic control system is indeed one of the roots of the upcoming financial crisis of the social healthcare system; current pharmacology is dealing with the signals of the still-ignored control system of the organism. “Wrong” signals being compensated by new drugs more and more often will lead to negative side effects. According to the 2003 report released by Tufts Center for the Study of Drug Development, the total cost of developing a new drug, including tests done after FDA approval, averages \$897 million. The FDA statistics available on the Internet show that during the last nine years, a total of 475 new drugs were tested, of which 118 did not pass the safety test (24.8%). The cost of that practice is around \$100 billion, paid by society.

However, studying chemical “bricks”—what cellular biologists involved in the project can indeed do—will not shed light

on the architecture of the edifice of a living organism as long as the fundamental physical interactions responsible for life remain unknown. These interactions carry programs of development, maintenance, reproduction, and death at all levels of living organization—the entire organism, organs, tissues, and cells. These interactions demonstrate properties of energy and information, but defining these interactions is a task for physicists, not biologists.

I would encourage the newly elected president of the United States to take on this problem. The president could, for instance, establish a government agency totally independent from the Academy of Sciences, NIH, and the National Science Foundation for the purpose of supporting and stimulating innovation in science. The agency could start with conducting an international scientific symposium on paradoxical effects in biophysics and medicine, aimed at developing a reasonable initial program. I believe that all coauthors of our book would be glad to participate in such an effort. Our attempt to conduct a similar symposium in 2005 fell through due to lack of funding. However, we are still connected with the 40 scientists from 13 countries who submitted their abstracts and have not given up on this goal.

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