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**21st Century Science & Technology**

(ISSN 0895-6820) is published 4 times a year by 21st Century Science Associates, 60 Sycolin Road, Suite 203, Leesburg, Va. 20175. Tel. (703) 777-6943.

Address all correspondence to **21st Century**, P.O. Box 16285, Washington, D.C. 20041.

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Electronic subscriptions are \$35 for 4 issues,

\$60 for 8 issues, and \$80 for 12 issues.

Back issues (1988-2005) are \$10 each (\$20 foreign). Electronic issues from 2006 on are \$10 each.

Payments must be in U.S. currency.

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# Vernadsky Was Not An Environmentalist

As we celebrate the 150th birthday of the great scientist Vladimir Vernadsky, it is of utmost importance to correct the gross misrepresentations of his work, particularly in the West, and to use his actual concepts to present an alternative to the anti-growth outlook (and scientific apparatus constructed to support it) of such groups as the Club of Rome, which have been promoting this outlook since the late 1960s.

Vernadsky, who founded the science of biogeochemistry, fostered the development of radiochemistry, and coined the term “noösphere,” observed that the evolution of living matter is proceeding in a definite direction. This direction was seen in such characteristics as increasing biogenic migration of atoms, increased energy use by life, and by the development of the nervous system: the “cephalization” noted by American scientist James Dwight Dana.<sup>1</sup> Instead of looking for the principle of “life” itself, which he believed usually led to philosophizing rather than useful scientific advancement, Vernadsky studied living matter, the totality of living organisms. Just as the evolution of life and “living matter” moves in a definite direction, and is seen only in the record of living matter on Earth (Vernadsky did not see evolution in purely abiotic layers of the Earth), so does the development of humanity’s social power. Vernadsky wrote, in his “Some Words About the Noösphere:”

“Mankind taken as a whole is be-

coming a mighty geological force. There arises the problem of the *reconstruction of the biosphere in the interests of freely thinking humanity as a single totality*. This new state of the biosphere, which we approach without our noticing, is the noösphere.”

“[M]an becom[es] a *large-scale geological force*. He can, and must, rebuild the province of his life by his work and his thought, rebuild it radi- cally in comparison with the past.”<sup>2</sup>

This outlook, of developing the noösphere in accordance with man’s reason, in the spirit of development seen in the biosphere across evolutionary time, runs directly contrary to the zero-growth outlook of environmentalist, back-to-nature, and similar groupings from the late-1960s to today. While Vernadsky opposed Malthus’s claim that limited resources fundamentally constrained man’s activity, his work was first popularized in the West by such writers as G. Evelyn Hutchinson (*An Introduction to Population Ecology*) and John P. Allen (creator of the failed Biosphere 2, and organizer of the first English-language publication of Vernadsky’s *Biosphere*), who used their take on Vernadsky’s concept of the biosphere to insist that humanity must live in a “balance” with nature, something Vernadsky never thought. Vernadsky, excited with the prospect of the use of nuclear energy, viewed resources as man-made, and saw our future as reaching out into the cosmos.

The idea of ending human growth, to prevent the use of finite resources, completely ignores key distinctions

<sup>1</sup> On this directedness in evolution, see Benjamin Deniston, “Biospheric Energy Flux Density” in this issue.

<sup>2</sup> Vladimir Vernadsky, “Some Words About the Noösphere” *21st Century*, Spring 2005, pp. 16-21.

between the abiotic lithosphere, the biosphere, and the noösphere. While evolutionary change may not be apparent in the non-living, living matter itself has transformed the resources and environments it operates in and on. The limits to growth of the early chemotrophs, living off sulfur compounds in ocean vents or within the Earth's crust, meant nothing to the later photosynthesizers, which were able to use the previously useless sunlight as a source of energy. The oxygen pollution created by these sea organisms could have been a call used by a modern environmentalist to slow down and limit population, but, instead, that free oxygen itself became a resource for the Krebs cycle of aerobic respiration. And photosynthesis didn't just make available more of the same sort of energy previously available to chemotrophic organisms; the biosphere as a whole had a much higher potential, as seen in the increased mass of both living matter

and matter shaped by life, with the advent of photosynthesis.

And so it goes for human society. While a physicist might believe that the total energy of the universe is a fixed constant, this has not been true for the noösphere. Before the discovery of nuclear processes around the turn of the 20th century, uranium was simply a yellow ore, useful for coloring stained glass. Today, uranium (and thorium) are power sources that can dramatically reduce the actual cost of providing energy. As we move into the development of fusion power (a decade or two later than we could have!), we will not simply have *more* power in plentiful supply, but a higher form of power, capable of creating process heat to allow for creation of hydrogen fuel, isotopically engineered materials, and fusion-torch recycling that would put even Portland's current curbside recycling program to shame. By discovering principles of nature, we *change* nature, by changing the

power of the noösphere, which is itself the greatest geological force.

So while the limits to growth and laws of thermodynamics may apply to electrons bumping around, or simple abiotic processes, they emphatically do *not* apply to the practice of human economy. Anybody maintaining that we must slow down our growth, to conserve resources, has endorsed a policy that will condemn mankind to extinction, by disavowing our heritage as a unique part of the natural, directionally developing world. Rather than slowing down to conserve what we have, we must instead bound forward rapidly, to bring the 2.7 billion people in poverty on this planet out of that condition, developing new resources and technologies on the way, as we get our space and fusion programs in gear to drive the noösphere forward in a way that would make Vernadsky proud.

That would make an excellent birthday gift!

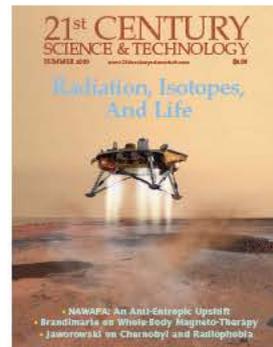
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