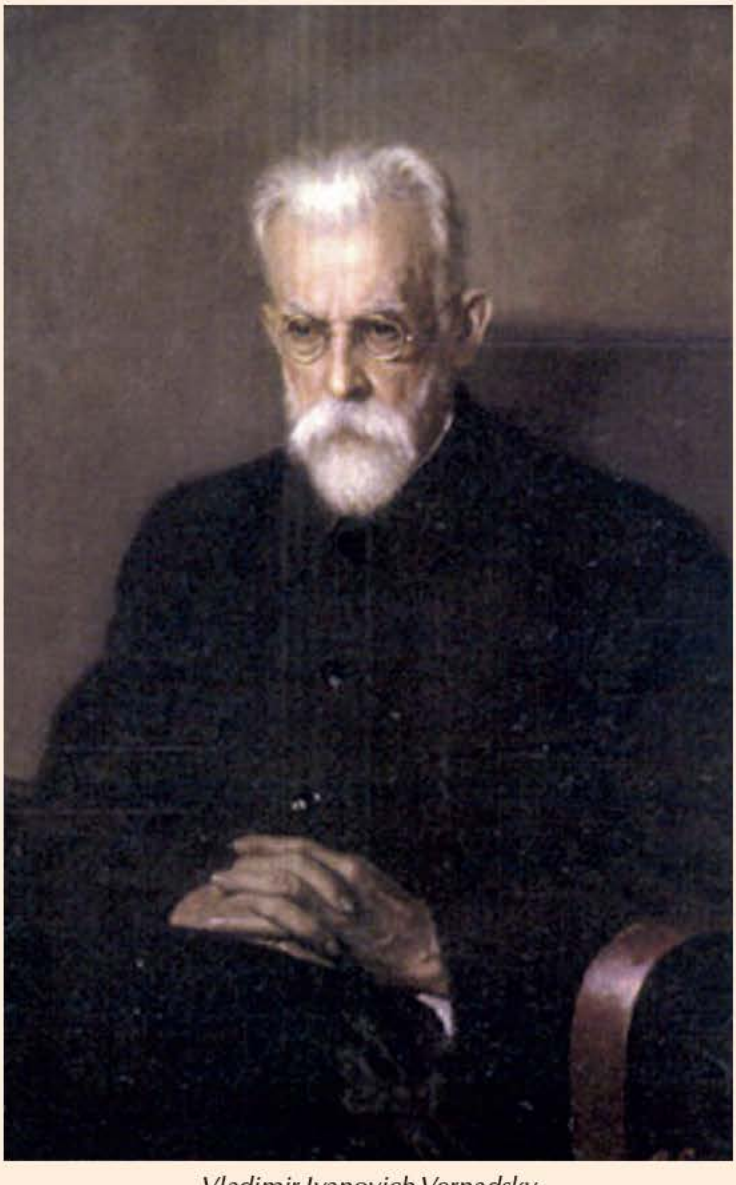
150 Years of Vernadsky

Introduction
by William Jones

In this issue, *21st Century Science and Technology* magazine celebrates the 150th anniversary of the birth of the scientist and visionary Vladimir Ivanovich Vernadsky (1863-1945), by publishing a number of celebratory contributions relating to Vernadsky and his work from scientists working in the Vernadsky tradition in Russia and Ukraine. The Vernadsky anniversary is being celebrated at the highest level in Russia and Ukraine this year, and it is fitting, given Vernadsky's global importance, to do so in the United States. Despite his ground-breaking work in establishing new fields of science such as geochemistry, biogeochemistry, and radiogeology, as well as his work in organizing science in both Russia and Ukraine, both during Imperial as well as in Soviet times, creating the Radium Institute in St. Petersburg and the Academy of Science and several universities in Ukraine, knowledge of the man and of his work in the United States is still either unknown or distorted. Vernadsky was a visionary in science. Not in the sense that his "science" was subordinate to some philosophical or religious notions, but rather because he viewed man's scientific activity, beginning with man's first controlled use of fire, as a significant, new, and powerful geological



Vladimir Ivanovich Vernadsky (1863-1945)

force in the universe: indeed, in Vernadsky's view, the most powerful.

While scientists and scholars may be aware of Vernadsky's work in providing a firm basis to the concept of the biosphere, a term which he brought into the mainstream of science in his 1926 monograph, entitled *The Biosphere,* there is only slight recognition in the U.S. of his scientific concept of the noösphere ["noös"—mind], that is, the realm in which man emerges in the biosphere and with his creative thought, begins to assume a dominant role in transforming and extending that biosphere. While Vernadsky was a visionary in the sense that he saw, further than his contemporaries, the tremendous potential of the discoveries that were being made in the first half of the 20th century, he was at the same time a very astute and active political figure. In his early years, he was instrumental in establishing the Constitutional Democratic Party (Kadets), at a time when political parties were not allowed in Russia. He served for many years in the Duma as a member of the Central Committee until the Bolshevik takeover of 1917, when members of the Kadets were being thrown into prison and generally harassed and suppressed. His commitment to the advancement of science in Russia, and in the Slavic world in general, led to his returning to Soviet Russia to work under the new regime. It was during this period of the last twenty five years of his life, that he made some of his greatest contributions.

Vladimir I. Vernadsky on expedition, c. 1910.

While he was generally recognized by the Soviet leadership as one of the most gifted scientists of his age, receiving the prestigious Hero of Socialist Labor award toward the end of his life, he was also a man of strong principle. He never accepted the tenets of the official "dialectical materialism," and his view of man and the biosphere and the noosphere were officially denigrated by the Soviet bureaucracy as "vitalism." When friends or colleagues were threatened with being shipped off to the Gulag, Vernadsky actively lobbied the Soviet leadership to keep them from being sent away, or at least, to ensure they were provided with the opportunity to continue working in their scientific field in exile. In this endeavor, while not always successful, he was absolutely fearless. Because of his opposition to dialectical materialism, most of Vernadsky's works of a more philosophical nature were not published until long after his death. It is hoped that this 150th anniversary will lead to the publication of all of Vernadsky's works as well as his personal papers, in his native language, and that a good portion will be rendered in competent English editions.

Vernadsky is not only important as an historical figure in science. As Academician Galimov indicates in his paper, Vernadsky is a part of our modern world. Having seen much further than his contemporaries, his thought still remains a fertile source for science today. In fields such as astrochemistry and astrobiology—fields only created in the last couple of decades—Vernadsky was already doing pioneering work, and his thoughts still serve to stimulate those working on these problems. But more importantly, the perennial optimism that provided him with solace even during the worst days of the war might well serve as a powerful antidote to the pall of cultural pessimism that has fallen over so much of science in the Western world. While he was not unaware of problems that can occur as man proceeds consciously to transform nature, he was also confident, as Academician Marov indicates in his essay, that man has, with his power of creative thought, which lies at the basis of all technological development, the means to overcoming any apparent "limits to growth."

Vernadsky was a firm believer in the notion of progress, seeing its effects in the unfolding of the biosphere, and, then, as a work of reason, in the productive activity of man in his development of human civilization. But for man, with his free will and his reason, progress becomes more of an imperative to realize rather than a blind "law of nature." Colonel Ignatenko, in his paper, emphasizes the morality Vernadsky saw as an inherent factor in the development of the noösphere, in terms of discoveries in economic science. Vernadsky's commitment to the development of nuclear energy was paradigmatic for his view of man's progress, from simple sources of energy in wood and coal to the ever denser resources, unleashed with the discovery of the atomic nucleus.

Vernadsky combined rigorous research with profound thought, which soared above the common assumptions of his day. He is, therefore, a scientist and thinker who should not merely be celebrated and admired, but whose ideas should be promoted and developed.