A Modern-Day Leonardo Reached Out To LaRouche

by Jonathan Tennenbaum

Pobisk Kuznetsov, a bold master of the fundamental science of change, could be and was described as "a Russian Leonardo da Vinci." The significance of the direct dialogue which developed between Lyndon LaRouche, Pobisk Kuznetsov, and related leading circles of Russian science from LaRouche's first Moscow visit of 1994, was an important theme of the Dec. 14-15 conference honoring Kuznetsov's life and work.

Leading representatives of Russian science institutions, students, and friends of Kuznetsov, took part, including S.P. Nikanorov (Moscow Physical-Technical Institute), L.N. Vdovichenko (Apparatus of the Russian National Security Council), O.M. Yun (Center of Information Technologies and Systems for Executive Branch Agencies), I.Ya. Vyrodov (Academy of the General Staff), V.S. Chesnokov (Presidium of the Russian Academy of Sciences), V.V. Yusyugov (International University of Nature, Society and Man in Dubna), and many others. Both Lyndon and Helga LaRouche made notable presentations; they follow in this *Feature* section, and then are followed by a brief biography of this remarkable scientific and creative spirit.

Genius Against Official Ideology

In his introduction to the conference **Prof. Yuri Gromyko,** President of the Moscow Academy of Culture and the Development of Education, noted, "In some measure, Pobisk Georgiyevich Kuznetsov was a symbol of Soviet science—of its component of genius, which tackled the most complex problems, and proposed unconventional solutions, doing this often not because of favorable social conditions for such work, but in spite of them." Ironically, Kuznetsov, while he worked for the welfare of the country, and for its future, along its most promising lines of development, often "acted and lived at odds with official ideology, and against it, and suffered several times because of this," including long years in the Soviet GULAG prison camps and political persecution in the 1970s.

Professor Gromyko emphasized Kuznetsov's unique personal qualities, which were key to "the huge array of specific ideas and results from the implementation of scientific programs, which were achieved by Pobisk Georgiyevich in his work with many teams of scientists, as well as with friends. Insofar as Pobisk Georgiyevich was always in a state of creative thinking and problem-solving, everybody who came into his field of influence or encountered even just some part of his ideas, was drawn into the intensive intellectual search process and dialogue, which he carried out, and was de facto, automatically transformed into a collaborator in that invisible domain of idea-generation, which existed around him."

Later in the conference, Gromyko gave a first overview of some of Kuznetsov's most notable achievements:

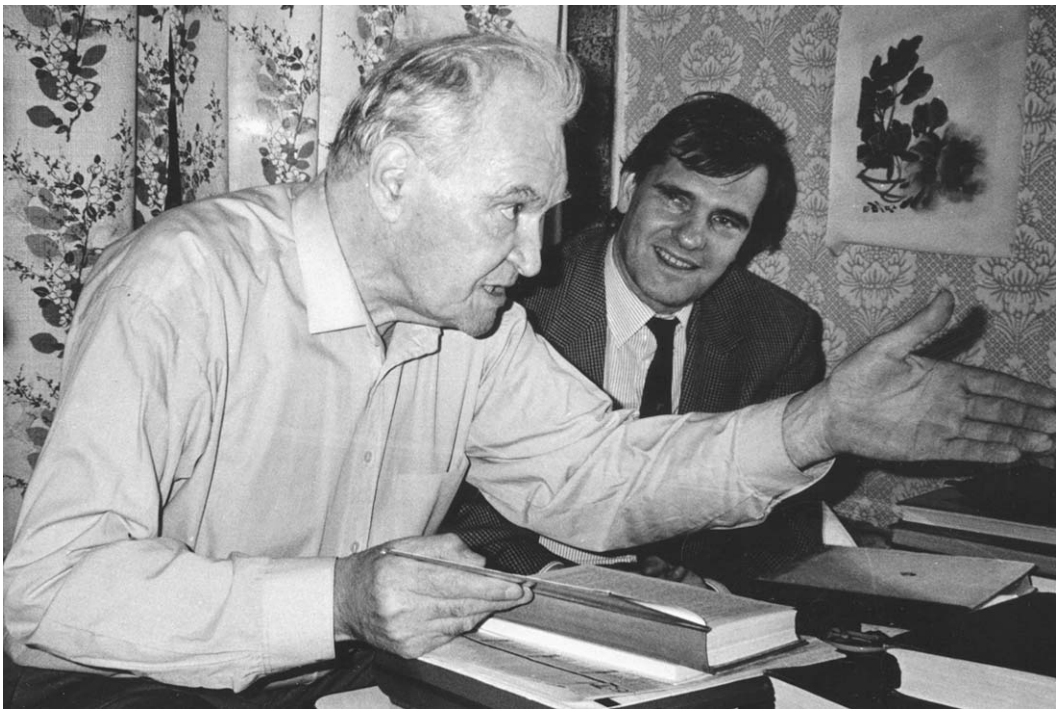
- A new concept of the phenomenon of life, leading to a critique of the concept of entropy.
- Pioneering work in the field of biophotonics and biochemistry, leading to a new approach to problems of biology and medicine, including the problem of aging.
- Creation of standardized methods for the organization and management of large-scale technological projects, widely used in the military-industrial complex of the Soviet Union (the famous "SPUTNIK-SKALAR" system).
- Application and extention of the method of generalized tensor analysis, originally developed by the American scientist Gabriel Kron, to the calculation and projection of large-scale evolving systems of a very general type.
- Development of methods for analysis of socio-economic processes on the basis of measurable physical parameters, and the elaboration of "laws of socio-economic development," constituting a Russian counterpart to the Physical Economy of Lyndon LaRouche.
- Creation of new fundamental hypotheses concerning the origins of language and of ideal elements in human mental processes, based on analyzing the results of the Russian scientists Ilyenkov and Meshcheryakov on the teaching and development of deaf-blind children. This work also had significant applications to the design of computerized command and control systems (see below).

Gromyko noted, that Pobisk Kuznetsov's work led him to a conception of "self-sustaining development," opposed to the Malthusian conceptions often put forward in the name of so-called "sustainable development." This was one of many points which brought Kuznetsov close to LaRouche and the Schiller Institute. In fact, Professor Gromyko stated in his introduction:

"The participation of the Schiller Institute and *EIR* in this symposium is of great importance for us, because a number of the ideas, put forward by Pobisk Georgiyevich, closely correspond to a number of the key ideas of Lyndon LaRouche. Or, one could say that several of the ideas of Lyndon LaRouche for us are a very important counterpoint to the ideas of Pobisk Kuznetsov. This applies, first and foremost, to his idea of the role and function of science in world development, to scientific-project programs for contemporary development, and to the idea of an anti-monetarist economics, which promotes the development of humanity, rather than genocide."

Physical Chemistry and 'Cosmism'

Kuznetsov's many-sided activity was further illuminated in the speech by his longtime collaborator **Spartak Nika-**



Pobisk Kuznetsov in April 1994. His lifelong scientific work on the distinction between entropic and anti-entropic systems, and his investigation of the laws of physical economy, made him highly receptive to Lyndon LaRouche's science of physical economy.

norov, of the Moscow Physical-Technical Institute. Nikanorov, who worked with Kuznetsov for some 37 years, noted that Kuznetsov "had a striking ability to interpret his own ideas, in his interlocutor's area of interest. One could discuss anything with him, as they say. . . . This ability of his was based on his understanding of the unity of science, and of current social practice as points of development." He emphasized that the extent of Kuznetsov's influence could not be judged on the basis of his published works alone; for, in addition, "conversations and the circulation of manuscripts played a big role. Kuznetsov's influence spread to a broad circle of people from various social strata. In Kuznetsov's address books are the names and telephone numbers of between 500 and 1,000 people."

Kuznetsov's work on physical chemistry, Nikanorov said, focussed especially on approaches and methods for chemical analysis, with special attention to effective methods for breaking the bonds in chemical compounds. Also, his work anticipated the enormous role of photochemical catalysis in the chemical industry of the future.

In an apparently quite different direction, Kuznetsov made major contributions to the practical applications of mathematical tensor analysis, and had pioneered the introduction of so-called network planning systems into management of the space sector, and many other sectors of the Soviet economy, leading to his central role in Russia's famous top-level "Scientific Council on Planning Large-Scale Systems on the Basis of Physically Measurable Magnitudes." In addition, Kuznetsov provided extensive assistance to commercial organizations, in developing their policies and strategies.

"It is generally accepted that Kuznetsov is a continuer of Russian Cosmism," Nikanorov stated, referring to a philosophical tradition which includes such thinkers as N.F. Fyodorov, N.A. Umov, Father Pavel Florensky, the space pioneer Konstantin Tsiolkovsky, Vernadsky, and others, and which locates Man's role in the lawful ordering and continuing development of the Universe as a whole. These ideas have exerted an important influence on Russian scientific thinking for a long time, without however having been scientifically established and elaborated in concrete practical form. Now, thanks to the work of Pobisk Kuznetsov, "for the first time in the history of this tradition, and in the history of human thought, the necessity of the ideas proposed has been understood and a detailed, elaborated concept created for a constructive worldview. Precisely this was the basis of his widely known concept of monitoring social development using physically measurable magnitudes."

It was striking that speakers again and again referred to the work of the 15th-Century Cardinal Nicolaus of Cusa (Kuzansky in Russian), as a starting-point for development of the principle of measurability—including in humanitarian and social sciences—which Kuznetsov applied in his scientific work. From a different, but completely coherent standpoint, **Helga Zepp-LaRouche** brought up the crucial relevance of Nicolaus of Cusa for the "Dialogue of Civilizations" which has become a matter of life-and-death urgency for the world today. It was striking to see how much Cusa was a familiar concept to the Russian audience at the conference—unlike the state of general ignorance of such great thinkers of the past, now so prevalant among comparable Western au-

diences.

According to Nikanorov, Kuznetsov's "crowning achievement" was his appeal to the Secretary General of the United Nations, the political leaders of all countries on Earth, the leaders of the Group of Seven nations, and the heads of the religious confessions, which is so striking for its qualities of sincerity and directness." In those declarations, Kuznetsov called for international cooperation to end genocide and religious strife, and to create a new "life-support system" for mankind as a whole, utilizing modern technologies, and laying the basis for realizing the creative potential of humanity.

The Science Of Change

Another influential area of Kuznetsov's work, presented to the audience by **Larisa Vdovichenko,** a researcher attached to the Russian National Security Council, concerned the applications of advanced mathematical and data-processing methods to the analysis of strategic world events. Vdovichenko described how Kuznetsov's approach to large-scale systems had been applied to the development of sophisticated databases and computer-based projection methods for government use. She emphasized the crucial importance of Kuznetsov's approach on subsuming physical parameters—particularly energy flows—in analysis of international strategic developments.

It should be noted, in this connection, that the development of electronic data-processing and control systems in the Soviet Union differed very significantly from the Western development of "information technology." In part this difference was itself a byproduct of the fact, that Pobisk Kuznetsov played an important role in the development of unique Soviet solutions to the problem of human control of complex technical systems in real time—methods distinctly different from those associated in the West with Norbert Wiener's "cybernetics."

An interesting example was presented by **Mikhail Kulakov,** a former specialist on design of command and control systems for rocket complexes of the Almaz enterprise, and presently director of the Electron Power research center. A crucial aspect of solutions, elaborated in part in the context of development of advanced air defense systems at Almaz and other locations, is the generation of "visual representations of dynamic media" by computer systems, permitting a human operator to rapidly grasp the essential characteristics of an unfolding *process* involving a very large number of components and multiple layers of human decision-making. Interacting with the system by means of such visual-form representations, which focus on *change* rather than presentation of a momentary state of the system, the operator can immediately pin-point any malfunction or other emerging problem, from the level of the whole system down to its individual components. Kulakov stated that the exploitation of this interactive control technology constitutes a major source of the superiority of the Russian C-300 air-defense system, as compared with the American Patriot system.

Pobisk Kuznetsov, who accomplished some of his most important scientific work in Soviet prisons, was so creative and universal a scientist as to be called "a Russian Leonardo da Vinci" by those who honored him in Moscow Dec. 14-15.

Kuznetsov's work on mathematics, logic, and the methodology of science, which developed in close relationship with practical applications in a wide range of industrial and technical domains, including the one just referred to, was discussed by several speakers at the conference, including **Mikhail Istomin** (philosopher, Member of Presidium of the Russian Academy of Sciences), **Andrei Petrov** (Academician of the Russian Academy of Natural Sciences), and **Prof. Boris Bolshakov** (International University of Nature, Society and Man at Dubna).

Istomin's talk, entitled "The Dialectical Method: Form And Content, From Nicolaus Of Cusa To Pobisk Kuznetsov," was fundamental, and a discussion of its main points would go beyond the limits of this brief article. Suffice it to say that Istomin summarized the attempt by Kuznetsov, based on a long historical line of philosophical work, to conceptualize what in Russia would typically be called "an objective law of the process of human discovery." The talk sparked a lively discussion among the conference participants, including the present author, centering on key issues which Lyndon LaRouche addressed in his speech.

Lively discussion also followed the presentation of **Jonathan Tennenbaum** of the Schiller Institute, entitled "The Content Of Science Is Its Process Of Development." This emphasized particularly the inseparable relationship between the content of science and the creative personalities of discoverers themselves, which are embedded as singularities in the developing manifold of human culture. No one can adequately understand Kuznetsov's scientific work, who has not

gotten a sense of his intellectual courage in the fight to overcome false ideas, his optimism and his humor—as this author was privileged to do, in the course of personal discussions. It is the same sense in which no one can be competent in physical science, who has not become "intimate friends" with Johannes Kepler, even across centuries of time, and reexperienced crucial moments of his discoveries.

Principle Of The Conservation Of Power

Andrei Petrov described Kuznetsov's work on the method of tensor analysis for the handling of physical systems of extreme complexity, based on earlier work by the American engineer Gabriel Kron, whom Kuznetsov held in high esteem. Petrov also recounted the origin of the discovery of the significance of what Kuznetsov called the "Principle of Conservation of Power," for the understanding of living systems as well as physical economies, whose evolution proceeds in the opposite direction as that implied by the so-called Second Law of Thermodynamics. Bolshakov recounted that one of Kuznetsov's ideas, was to identify the unifying feature connecting the parts of a system, with the invariant of a group of transformations. This he used as the starting-point for a theoretical investigation leading to the establishment of the laws of development of the system. On this basis Kuznetsov, working in collaboration with Roberto Bartini, was able to formulate the notion of a "general law of Nature." Applying the same method, Kuznetsov was led to the formulation of "invariants of the historical development of humanity," and to develop practical methods for projection of the future.

In this context, Bolshakov emphasized the fundamental difference between Kuznetsov's concepts for world development, and "the recommendations of experts of the United Nations, which were supported by the leaders of 150 countries, but which already then were obsolete by 50 years in comparison to Vernadsky, and by 100 years in comparison to Podolinsky. . . . The recommendations of the UN were based on the impact of the Second Law of Thermodynamics: to inmpose a limit on population growth and reduce consumption." However, Bolshakov continued, "Kuznetsov had the opposite conception: to develop sources of development of the creative process, increasing the efficiency of new technical systems, discovering new sources of energy and new productive technologies. . . . This permits the integration of social and technological sciences."

During the second day of the conference, several examples of revolutionary new technologies were presented, whose development owes much to Kuznetsov's scientific work and his role as a prime organizer of "crash program" efforts in the Soviet Union. Here I shall mention only three examples.

One is a novel type of aircraft called an "Ekranoplan." The Ekranoplan flies at extremely low altitudes (of the order of 3-10 meters) above the surface of land or sea, utilizing the aerodynamic interaction with the surface (the so-called "screening effect," or in Russian, "*ekran* effect") to generate a large additional lift. It is thus able to transport heavy cargo far more efficiently than conventional aircraft, and faster than sea and most ground transport. It was Kuznetsov's close collaborator, aircraft designer Roberto Bartini, who early on conceived the idea of exploiting the *ekran* effect to create revolutionary means of transport over any kind of land terrain, rivers, seas and oceans, including the vast tundra areas of Russia.

Ekranoplans were mainly developed, however, in secret Soviet military programs as a weapons platform and rapid-deployment vehicle. One of the prototypes, operating on the Caspian Sea, became known in the West as the "Caspian Sea Monster" after being photographed by Western spy satellites. According to a presentation at the conference, Pobisk Kuznetsov played a key role in overcoming design problems revealed in one fatal crash of the "monster," opening the way to ongoing commercial development of Ekranoplans in Russia. Ekranoplans have now been developed that are so stable in their operation, that conventional pilot training is in principle not needed to operate them.

Another example is a method, presented at the conference by **Vladimir Serebryakov** of the Energiya Rocket and Space Association (where the famous Soviet Buran space shuttle was developed), for producing synthetic fuels from industrial flue gas, and eventually even from ordinary air! The process exploits technologies originally developed in the context of the Soviet manned space program, including especially the life-support systems, in which Kuznetsov played an important role. First, carbon dioxide is separated from the input gas using highly efficient ion-exchange membranes. Then, it is purified to high concentration, combined with water vapor, and electrochemically decomposed by high-temperature electrolysis to produce synthetic gas, from which a wide variety of hydrocarbon substances, including fuel for automobiles, can be synthesized. Nuclear reactors could supply the energy required for production of such synthetic fuels.

A final example is a "plasma torch" process for reducing industrial and domestic waste products to purified chemical elements and simple, industrially utilizable compounds, while generating considerable amounts of energy at the same time. This method, utilizing methods of precise plasma temperature control developed at the Kurchatov Institute in the context of nuclear programs, is now becoming available for commercial use.