Venedikt Petrovich Dzhelepov (on his sixtieth birthday)

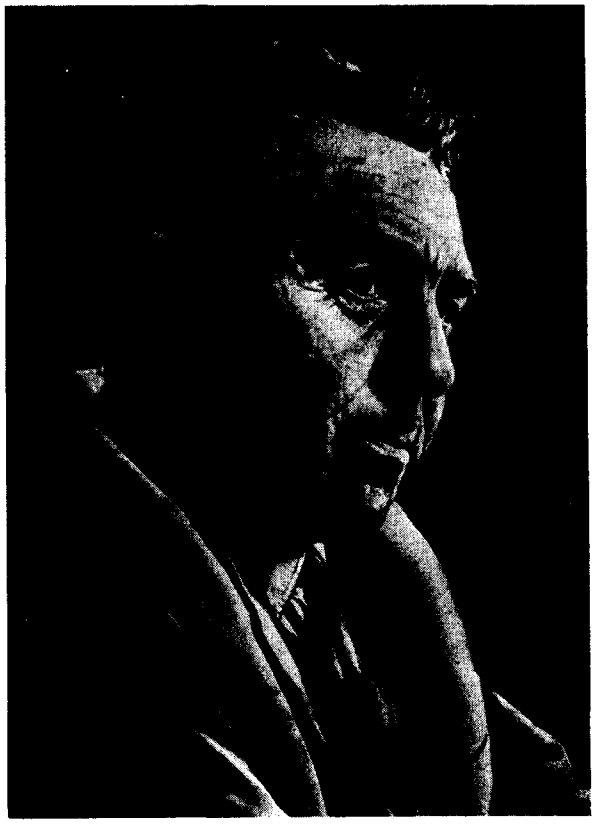
V. P. Dmitrievskiĭ, L. I. Lapidus, M. A. Markov, B. M. Pontecorvo, and A. A. Tyapkin

Usp. Fiz. Nauk 110, 153-154 (May 1973)

April 12th is the 60th birthday of Venedikt Petrovich Dzhelepov, Corresponding Member of the USSR Academy of Sciences and a Soviet physicist known for his research and scientific-administrative activity in the physics of the atomic nucleus and elementary particles and the physics and engineering of powerful modern particle accelerators.

Dzhelepov was born in Moscow into the family of a civil servant. After completing school, he move to Leningrad in 1930, where he worked for a while as an electrician and then entered the Polytechnic Institute in 1932. He graduated from the physicomathematical faculty in 1937 as a nuclear physics major. In the same year, under the supervision of A. I. Alikhanov, he carried out his first scientific research studies, which were related to experimental verification of the conclusions of the Dirac theory. He later helped place the first Soviet cyclotron in operation in I. V. Kurchatov's laboratory at the Radium Institute of the USSR Academy of Sciences. In 1941, Dzhelepov was engaged in research related to the construction of a 12-MeV cyclotron at the Leningrad Physico-technical Institute of the USSR Academy of Sciences.

During the Second World War, Dzhelepov was a member of the group of physicists who formed the new nuclear center under Academician I. V. Kurchatov. Here he measured the fission constants of nuclei. In 1947, he defended his candidate's dissertation, whose subject was determination of the number of secondary neutrons emitted on nuclear fission.



An interest acquired at the very beginning of Dzhelepov's scientific activity, when he was involved in starting up the country's first cyclotron, was to influence his later career, the choice of his principal field of scientific research. From the very beginnings of high-energy physics, he devoted himself with energy to the organization of scientific research in this new and rapidly developing field of physics in our country. From 1948 on, Dzhelepov was devoting all of his time to research in the physics and engineering of relativistic accelerators and to experimental studies of the nuclear interactions of accelerated particles. It was in this field of physical research, which was a new one at that time, that his talents as a scientific organizer emerged fully into the light.

In 1948, Dzhelepov was appointed Deputy Director of the new Laboratory near Moscow, where he became one of the supervisors of scientific research on the first Soviet 480-MeV synchrocyclotron.

Among Dzhelepov's experimental studies, we should note first a major cycle of research in the interactions of high-energy neutrons with nucleons and nuclei. A whole series of new fundamental results stands to his credit. Study of elastic scattering of neutrons by neutrons made it possible to prove symmetry of the nuclear forces at high energies. The spin dependence of exchange forces was investigated for the first time for the neutron-proton system. Dzhelepov generalized this cycle of studies in his doctorate thesis.

A study of polarization phenomena in complex experiments with double and triple scattering of nucleons that was carried out under Dzhelepov's supervision made it possible to establish important properties of the nucleon interaction when inelastic processes make a large contribution.

Dzhelepov was awarded two USSR State Prizes for his successful scientific activity.

A new phase in Dzhelepov's scientific and scientific-administrative career is associated with the founding of the Joint Institutes of Nuclear Research at Dubna in 1956. Since that time, he has headed a multinational scientific staff as director of the Nuclear Problems Laboratory. During this period, Dzhelepov and his collegues made an investigation of pi-meson formation in nucleon collisions that provided an important confirmation of the charge independence of nuclear forces. Dzhelepov followed this with an interesting series of diffusion-cloud-chamber studies. His observation of the electronic decay of negative [154] pi-mesons in flight and the determination of its probability were important steps in confirming the universality of the weak interaction. Mu-atomic and mu-molecular processes, including mu-catalysis of nuclear

fusion reactions, were studied in the diffusion-chamber program. Dzhelepov's group was the first to obtain quantitative data on elastic scattering of mu-mesic atoms of hydrogen isotopes by hydrogen atoms, and they also detected certain hitherto unobserved catalytic reactions.

Dzhelepov is known as a scientist who devotes a great deal of attention to the development of nuclear-physics methods. A one-meter propane bubble chamber was built under his supervision in 1962, and has since been used in a broad range of studies of pion-nucleon interactions. Rare radiative resonance decays and reactions resulting in multiple formation of neutral strange particles have also been studied on this device. Diffractive dissociation of pi-mesons near the reaction threshold has been registered in this chamber in studies performed in recent years.

Since 1956, Dzhelepov has been working with his characteristic perseverance on the future outfitting of high-energy-physics laboratories with accelerators of a new type with high beam intensities. He is among those directing work on the development of an accelerator with spatial magnetic-field variation and of an electronic model of a relativistic cyclotron with strong focusing. It was on his initiative that the plan for rebuilding the Dubna synchrocyclotron into a heavy-current accelerator with spatial magnetic-field variation was conceived and implemented.

Dzhelepov has made a major contribution of applied nature to the use of relativistic accelerators for medical research. The country's first proton-beam unit for radiation therapy was set up at the Dubna accelerator on his initiative. Soviet oncologists are now carrying out systematic research with this beam. Dzhelepov's scientific activity has won widespread recognition. He was elected a Corresponding Member of the USSR Academy of Sciences in 1966. He holds the Order of Lenin and the Order of the Red Banner of Labor.

His range of interests and concerns ranges far outside the confines of the scientific research in which he is directly involved.

Endowed with inexhaustible energy and an astonishing capacity for work, he finds time to interest himself in all business of the Laboratory and actively supports new undertakings in the Joint Institutes of Nuclear Research.

Dzhelepov devotes much attention to the preparation of young experimental physicists. Many of his students have become Doctors and Candidates of Physicomathematical Sciences and are active in research in high-energy physics in jobs at various of the country's institutes and laboratories.

Dzhelepov's scientific-administrative activity has not been limited to the Nuclear Problems Laboratory and the Joint Institutes of Nuclear Research. He is active in the work of the Scientific Coordination Council of the High-energy Institute at Serpukhov and carries a heavy work load in the USSR Academy of Sciences Division of Nuclear Physics as Deputy Academician-Secretary.

A man of energy with an enormous appetite for work. Dzhelepov is in the prime of his creative powers and will certainly do much more for the development of Soviet science.

His friends, peers, students, and colleagues heartily congratulate him and sincerely wish him the best of health and new successes in his work.

Translated by R. W. Bowers