CHRONICLES

# 70th ANNIVERSARY OF SABIR YUNUSOVICH YUNUSOV

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"A plant is a storehouse of priceless riches created by nature. The task of the scientist is to understand these riches and convert them to the use of man." In these words, Corresponding Member of the Academy of Sciences of the USSR, Academician of the Academy of Sciences of the Uzbek SSR Sabir Yunusovich Yunusov has expressed his deep conviction and the credo of a Communist research worker. The main aim of his life in science has been the study of natural compounds and the search, as he himself has described it, "for new alkaloid-bearing plants and their alkaloids in order to find plant substances of theoretical and practical value. . . ."

S. Yu. Yunusov was born on March 18, 1909, in Tashkent. The son of a working bricklayer, he was left early without a father and was brought up in a children's boarding school. Sabir was not yet 14 years old when he started out on his working road. The eminent scientist and chemist started this road as the pupil of a tin-can maker in an artel [workers' collective], where he then began to work as a master. From here the trade-union sent the young worker for training – in the Karl Marx Tashkent Pedagogic Technical Institute. The capabilities of the youth rapidly attracted attention. He graduated from the technical school with distinction in 1929 and remained there working as a teacher of mathematics.

He worked with enthusiasm, conscientiously teaching workers like himself and peasants' children. But he was not satisfied with his own knowledge and longed for further learning. Sabir Yunusov entered the chemical faculty of the Central Asian State University. Five years later he graduated successfully. The period of his university course also formed the first steps in his scientific activity. In his student practice he began in the division of alkaloid chemistry of the All-Union Scientific-Research Institute of Pharmaceutical Chemistry, which was directed by the leading Soviet chemist, Academician A. P. Orekhov. The meeting with him proved to be decisive for Sabir Yunosovich. He worked for about ten years under the immediate direction of A. P. Orekhov – first as a registered post-graduate student of the Central Asian State University, after which he took up research activity in his laboratory. The sensitive pedagogue Aleksandr Pavlovich Orekhov did much to develop the scientific capacity that he detected in the young post-graduate student, directed his research and attentively followed the formation of the budding scientist. As early as 1936, in a paper on "Recent investigations in the field of alkaloid chemistry," Academician Orekhov reported the scientific success of his pupil who had succeeded in isolating from wild flora of the poppy family six previously unknown alkaloids and had established the structures of some of them, such as remerine and armepavine. On the basis of this work,

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three years later Sabir Yunusovich defended his first dissertation for the degree of Candidate of Chemical Sciences (1939).

Having obtained a scientific degree, Sabir Yunusovich began to work in the All-Union Scientific-Research Institute of Pharmaceutical Chemistry in the capacity of Senior Scientific Worker. This was a time of interesting and fruitful work and great and daring plans, the performance of which was interrupted by the treacherous attack on our Motherland by the Fascist aggressors. Together with millions of the same age, Sabir Yunusov took up a rifle. Among his numerous government awards, the first was the war medal "For the Defense of Moscow." In these battles he received severe wounds.

On discharge from hospital, Sabir Yunusovich returned to Tashkent and again took up scientific work. In the spring of 1943 in the Institute of Chemistry of the Uzbek Branch of the Academy of Sciences of the USSR he organized a laboratory of alkaloid chemistry. Here, S. Yu. Yunusov continued his activity as preceptor and teacher, developing the investigations begun under the direction of A. P. Orekhov. The group of workers of the laboratory that he headed concentrated their efforts on the search for new alkaloid-bearing plants and on determining the structures of the compounds isolated. They studied the dynamics of the accumulation of the alkaloids and the mechanism of their formation in the various plant organisms according to their growth site and the vegetation period. From the results of these investigations S. Yunusov then wrote the book "The Dynamics of the Accumulation of Alkaloids and their Pole and Formation in Plants," which was awarded the diploma of the All-Union Mendeleev Chemical Society.

In 1949, Sabir Yunusovich became a Doctor of Chemical Sciences, having successfully defended his dissertation on "The alkaloids of the tetrahydroisoquinoline and phenanthridine series." And he soon became director of the Institute of Chemistry. In the spring of 1952, he was elected an Academician of the Academy of Sciences of the Uzbek SSR and he became a member of the Presidium and Vice-President of the Scientific General Staff of the Republic.

During all these years, S. Yu. Yunusov continued to direct the laboratory of alkaloid chemistry. In addition to this, he became more and more convinced that the value to the national economy of plant riches is determined not by their alkaloids alone. Like all other representatives of the biosphere, plants contain hundreds and thousands of different chemical compounds the interaction and mutual transformations of which determine the essence of vital phenomena. Only after the chemical structures of the individual components and the mutual transitions and interconnections of the component parts of a given living organism have been elucidated will it be possible to judge the functions of the individual compounds in the vital phenomena and thereby approach a solution of the problem of the deliberate control of the processes taking place in the plants. It is impossible to do this within the framework of a single laboratory. This great complex problem can be solved only by the efforts of a large group of workers relying on the power of the whole of modern experimental technique. And there, in 1956, on the initiative of Academician S. Yu. Yunusov, a new Institute was created within the Republican Academy – the Institute of the Chemistry of Plant Substances.

One after the other, subdivisions within the walls of the young scientific institute appeared designed to solve concrete problems – laboratories of glycoside chemistry, of fat chemistry, of plant proteins, of terpenes, and of acids, of lignin, of carbohydrates, of nucleic acids, of coumarins, and of organophosphorus compounds. Laboratories designed to study the possibility of obtaining plant regulators synthetically are being organized in parallel – laboratories for defoliants, herbicides and growth substances, and of phytotoxicology. Sabir Yunusovich understands that a major scientific problem can be solved only by workers with high scientific qualifications and, with the energy that is characteristic of him, is looking after the training of qualified personnel and is carefully cultivating talented young people exhibiting a capacity for independent investigations. At the same time, a multitude of questions connected with the creation of a modern scientific institute have to be solved, and S. Yu. Yunusov, without ceasing his scientific activity for a minute, is completely immersed in a labyrinth of problems connected with the construction of a new building, the ordering and acquisition of the latest apparatus, and the creation of the experimental-production basis of the Institute. How successful all this has been can be judged from the fact that after only the first decade of its existence, namely in 1967, for services in the development of science and the training of scientific workers the Institute was awarded a high Government award – the Order of the Red Banner of Labor.

The scientific authority of Sabir Yunusovich is growing simultaneously. In 1958, he was elected Corresponding Member of the Academy of Sciences of the USSR, and in 1962 a member of the "Leopoldina" Deutsche Akademie der Naturforscher in Halle (GDR) – one of the oldest academies in the world, founded more than three centuries ago. And as the highest recognition of many-sided and fruitful work, by a decree of the Presidium of the Supreme Soviet of the USSR of March 13, 1969, for great services in the development of Soviet science Academician S. Yu. Yunusov was honored with the high title of Hero of Socialist Labor with the award of the Order

of Lenin. He is a bearer of the Orders of the Red Banner of Labor and of Peoples' Friendship and the Badge of Honor, has been awarded many medals, and has been honored with the title of Honored Scientific Worker of Uzbek SSR, the Veruni State Prize of the Uzbek SSR for Science and Technology, and diplomas of the Presidium of the Supreme Soviet of the Uzbek SSR and of the Soviet Committee for the Protection of Peace; and in 1971 for achievements in the development of alkaloid chemistry he was awarded the Dmitrii Ivanovich Mendeleev Gold Medal.

Such is the recognition of his scientific merits. However, Sabir Yunusovich does not belong among the so-called narrow scientists. He has always associated strenuous and fruitful research activity with pedagogic, scientific-organizational, and social work. His quality as a scientific organizer has been fully and clearly shown in the posts of Vice President of the Academy of Sciences of the Republic and Chairman of the Division of Geological and Chemical Sciences. In 1961-1967, Sabir Yunusovich performed great work in the Committee on Lenin Prizes and edited the journal "Doklady Akademii Nauk Uzbekskoi SSR" ["Proceedings of the Academy of Sciences of the Uzbek SSR"]. A member of the Party since 1950, he was elected a member of the Tashkent town committee of the Party and a Deputy of the Tashkent gorsoviet [town soviet]. He has actively participated in the activity of the Soviet committee for the solidarity with the countries of Asia and Africa.

Since 1970, S. Yu. Yunusov has been permanent president of the Scientific Council on the Defense of Dissertations Submitted for the Scientific Degree of Doctor of Sciences in Chemistry and Chemical Technology at the Institute of the Chemistry of Plant Substances of the Academy of Sciences of the Uzbek SSR.

Sabir Yunsovich has been a participant in and director of many scientific expeditions, the itineraries of which in the search for new previously unknown alkaloid-bearing plants have covered the whole of central Asia. Together with his pupils and colleagues, he has studied thousands of species of plants. By no means all of them proved to be alkaloid-bearing. The scientist did not worry, and he taught others not to be worried.

"In science, a negative result is not a failure but only a factor in understanding," Sabir Yunusovich explains to his young colleagues. "It gives experience which in itself is of no small scientific value."

However, there has also been no lack of discoveries. In the Central Asian flora, Yunusovich and his pupils have found plants rich in useful natural substances, including unique ones. He and his colleagues at the Institute have isolated 590 alkaloids, of which more than a half were discovered and studied for the first time. They have demonstrated the structures of 245 alkaloids. Conclusions have been drawn concerning the possibility of the practical use of plant substances in industry, in medicine, and in agriculture. By a decision of the Ministry of Health of the USSR, more than 10 preparations recommended by the Institute have been introduced into medical practice and twice as many are now undergoing clinical trials.

The work of S. Yu. Yunusov on natural alkaloids has proved very important from the scientific and practical points of view. He and his successors have elucidated the features of the connections of the chemical structure of substances and their pharmacological properties. In the clinical respect, these derivatives are not infrequently more effective than the alkaloids themselves. Scientists of the Institute under the direction of S. Yu. Yunusov, together with medical men, have found the causes of diseases affecting man and animals that are sometimes widespread in central Asia – Dzhalangarian encephalitis and toxic hepatitis with ascites: Their causative agents are alkaloids present in certain plants. On the recommendation of the scientists, these plants have been placed in quarantine and at the present time the diseases mentioned have been practically eliminated.

"We can be proud of the broad investigations of alkaloids found in domestic plant material by the school of A. P. Orekhov. The Academy of Sciences of the Uzbek SSR has now become a center of investigations on alkaloids." So wrote the distinguished Soviet scientist Academician A. N. Nesmeyanov.

More than 700 scientific papers have been published by Sabir Yunusovich Yunusov. The handbook "The Alkaloids," compiled by him, in which for the first time the investigations of Soviet scientists in the field of the chemistry of plant substances has been systematized and generalized, has already gone through two editions. Today many of his books are reference works for young research workers.

The education of youth and the training of scientific workers are always in the field of view of this noted scientist. Workers at the Institute have defended 30 Doctoral and more than 230 Candidates' Dissertations. Mainly by its own efforts, through the promotion of young people, the Institute is providing itself with highly qualified workers. Here it is appropriate to make the following observation. The Institute that Academician S. Yu. Yunusov directs is devoted to chemistry and, naturally, it is mainly qualified chemists that are trained in it. At the same time, the investigation of the biological properties of plant substances with the aim of their use as drugs is carried out by pharmacologists, who usually have medical training. Before the creation of the In-

stitute of the Chemistry of Plant substances there was not one Doctor of Science specializing in pharmacology in the Republic. During the existence of the Institute eight pharmacologists working in it have obtained a higher scientific qualification – doctorates of science. At the present time, a large proportion of them are heading appropriate divisions, departments, and laboratories in the higher institutes of learning and scientific-research institutes of the Republic. The Institute has become a forge not only for key organic chemists and bioorganic chemists but also for medical workers specializing in the field of pharmacology.

The publication in Tashkent of the All-Union scientific journal "Khimiya Prirodnykh Soedinenii" ["Chemistry of Natural Compounds"] is an undoubted recognition of the worth of the Uzbekestan school of chemists founded by S. Yu. Yunusov and its pupils and successors in the field of chemistry of plant substances. Sabir Yunusovich is its editor-in-chief. The journal has been issued since 1965 and now has a broad circle of subscribers in the Soviet Union and many foreign countries. It is translated into English in the USA.

Academician Yunusov is a constant participant in Republican and All-Union scientific congresses and conferences and has taken part in many international congresses and symposia in the United Kingdom, Hungary, France, Switzerland, etc.

Sabir Yunusovich has reached the age of seventy. This is a considerable age, but by no means an extreme one, as is shown most convincingly by the activities of the scientist himself, who is continuing to keep watch on his working post.

The Order of the Red Banner of Labor Institute of the Chemistry of Plant Substances directed by S. Yu. Yunusov has grown into a large scientific institute combining the activities of 18 scientific laboratories. The authority of the Institute in our country and beyond its borders is great. As before, the creative interests of the venerable scientist are connected with alkaloids. He is directing the investigations of young scientists and is acting as consultant, and himself performing research work which from year to year is expanding his scientific knowledge. Trials have begun of a new anti-wilt preparation created under the direction of S. Yu. Yunusov on the basis of the desert plant Peganum harmala. The creation of this effective preparation is the response of the scientists of the Institute to the resolution of the July 1978 Plenum of the Central Committee of the Communist Party of the Soviet Union on the task set by the Party of developing effective means of plant protection. The State Pharmacological Committee of the USSR has approved the new drug deoxypeganine, obtained from the same plant and intended for the treatment of the sequelae of poliomyelitis and some other diseases. This scientific development was also directed by S. Yu. Yunusov.

Sabir Yunusovich has broad plans. "I still owe much to the people," states the scientist. "I want to do as much as possible." As before, such scientific research directed to utilizing the riches of nature in the service of man is the main objective of his life.