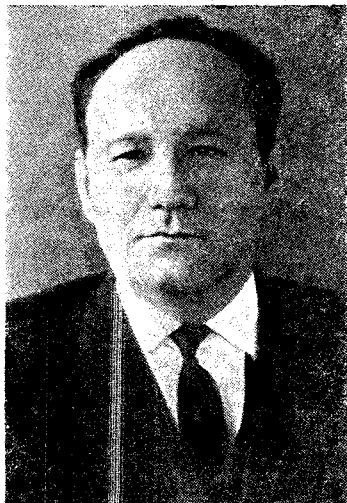


60th BIRTHDAY OF DOCTOR OF CHEMICAL SCIENCES N. K. ABUBAKIROV

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A group of original investigations in the field of plant glycosides and related compounds, the study of about 100 plants, the determination of the structures of more than 90 substances, syntheses of complex natural compounds, eight original medicinal preparations introduced into officinal medicine, about 300 scientific papers, 26 Candidates and two Doctors of Science prepared — this is far from a complete list of the scientific "luggage" with which Doctor of Chemical Sciences Professor Nail' Kadyrovich Abubakirov has reached his 60th birthday.

His journey in science began in 1946 in the Institute of Chemistry, Academy of Sciences of the Uzbek SSR. But even before this he graduated as an extramural student from the chemical faculty of the Central Asian State University in 1941, made an accelerated entry into the school for commanding officers and had signed with fire the warpaths, which he followed from Stalingrad and Kursk through the Ukraine and Moldavia, Rumania and Bulgaria, Yugoslavia, Hungary... The military efforts of Nail' Kadyrovich were recognized by the following decorations: "Order of the Red

Banner of Battle," "Order of Bogdan Khmel'nitskii," 3rd Class, "Order of the Patriotic War," 1st and 2nd Classes, and two "Orders of the Red Star." He was also awarded the Socialist Federative Republic of Yugoslavia "Partisan Star," 2nd Class. In 1942 in the period of the battle for Stalingrad, the young officer became a Communist. On the Victory Day he was in Austria serving as a representative of the Chief of Staff of a corps with the rank of Lieutenant-Colonel of the Guards.

After demobilization he had to start from the bottom — with the post of junior scientific worker in the laboratory of alkaloid chemistry directed by S. Yu. Yusufov.

"I consider it fortunate that my first steps in science had to be taken in just this laboratory," says N. K. Abubakirov, "Sabir Yunusovich helped me find my vocation and determined its main direction, which became the basis of my whole subsequent activity in science."

In 1950, Nail' Kadyrovich successfully defended his candidate's dissertation, completed under the direction of S. Yu. Yusufov and devoted to the study of the alkaloids of plants of the *Delphinium* genus. And he then began to develop what was now his "own" subject expressing his scientific interests connected with investigations in the field of the chemistry of plant glycosides. These investigations formed the basis of his doctoral dissertation which he brilliantly defended some years later.

In 1956, in the Institute of the Chemistry of Plant Substances, created within the system of the Academy of Sciences of the Republic N. K. Abubakirov became director of the laboratory of glycoside chemistry. "Science must effectively serve the people," is how Nail' Kadyrovich explains the reasons for the choice of this field of science. "Consequently, in science it is important to pose problems not only worthy of the modern level of its development but necessarily also those which must lead to a rapid introduction into practice. In this sense, plant glycosides represent an extremely favorable material for a research worker..."

The best results of the laboratory directed by N. K. Abubakirov have been achieved in the field of cardiac glycosides, which are of great importance in medicine. In those years when the technique of experimental investigations was poor, serious work was already being carried out here on the isolation of complex natural compounds from plants. Olitoriside and erysimoside — the first natural glycosides whose structures were demonstrated in our country — were obtained. Later investigations performed by Soviet and foreign scientists confirmed the

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absolute reliability of the results of the early investigations of the laboratory, which were relegated by Nail' Kadyrovich himself to the category of trial, still apprentice, studies.

In addition to the solution of a number of purely chemical problems of the determination of the structures of new compounds, N. K. Abubakirov performed valuable investigations on the biogenetic links between the glycosides of individual plants and the processes of their breakdown and synthesis. His work threw doubt upon and then convincingly refuted the hypothesis put forward earlier by certain foreign workers of so-called genuine, primary, glycosides existing plants. The essence of N. K. Abubakirov's conclusions, based on profound experimental research and a strict mathematical approach to the evaluation of natural phenomena was as follows: the separation of glycosides into primary and secondary is unjustified, the presence in plants of compounds with simple and complex structures is normal, and glycosides are not something invariable, laid down in the plant organism once and for ever, rather they are compounds constantly in movement, in a state of variability and a continuous process of inversion and reversion.

These theoretical foundations led to important practical results. Thus, in 1959 the cardiac glycoside strophanthin was found in plants of domestic flora. The raw material for this preparation is imported from the countries of south-east Africa.

Very important theoretical studies were made by N. K. Abubakirov on the isomerization of the aglycones of the cardiac glycosides and their conversion into other physiologically active compounds. In his laboratory in the sixties, substances possessing hormonal activity were synthesized from cardiac aglycones: 19-norcortexone, 19-norprogesterone, and 14-hydroxyestrone. A great advance was the stereodirected synthesis of the aglycone uzarigenin performed in 1969-1970 under the direction of N. K. Abubakirov. The attempts made previously by some foreign workers to obtain this compound were unsuccessful. There are only three or four papers of similar nature in the whole of the world scientific literature.

The results of these investigations, in their turn, made it possible to pass to the following stage of the work — a study of the mechanism of the action of cardiac glycosides at the cell level. This work has been carried on intensively in the laboratory since then. A completely original two-center model of the digitalis receptor has been put forward which explains the cause of the activity of cardiac glycosides differing from one another in the structural elements of the steroid part of the molecule or the sugar component. This hypothesis, relating to the physiological function in living organisms of an important enzyme — transport Na^+, K^+ -ATPase — is far beyond the framework of general interest in features of the action of drugs and touches on more general problems of modern biochemistry.

Up to the last decade, scientists have not assigned the rotenoids — complex natural compounds isolated from certain tropical plants and possessing insecticidal properties — to the class of glycosides. Investigations performed by N. K. Abubakirov in his laboratory have forced the scientific world to reconsider this point of view. It has been found and demonstrated that rotenoids can exist in the form of glycosides and several such compounds have been isolated. One of them — amorphin — has proved to be not only an insecticide but also a drug that is extremely effective in some disturbances of cardiovascular activity.

Investigations performed under the direction of N. K. Abubakirov on saponins, which have for a long time been a "blank spot" in the chemistry of natural compounds, have become a byword in science. Several tens of these complex substances have been isolated from the local flora and their structures have been determined. The results obtained in their study have permitted an important theoretical conclusion concerning biogenesis — the formation of complex glycosides in the plant organism not only by the gradual building up of carbohydrate chains with individual sugars, but also directly with large blocks of oligosaccharides.

Indicative for the latest stage in the scientific activity of N. K. Abubakirov are his investigations in the field of ecdysones — substances of a steroid nature fulfilling the role of hormones in the organism of insects and also found in plants. A systematic study of the phytoecdysones, which was first performed in our country by Nail' Kadyrovich in his laboratory has led to the finding of a large group of plants producing this type of compound. The finding in ecdysones of an anabolic medicinal effect shows their great practical importance, and the recognition of the interconnections and interdependences of the plant and animal worlds will lead us to an attractive direction in science which is only just being born — chemical ecology.

It is just in this direction that the interests of the scientist are turned today. To his investigations on chemical ecology Nail' Kadyrovich is behaving rather as to a scientific enthusiasm, but he is including an extremely serious content in them — fairly fundamental research patterns. "We have erred or, at least, have thought too narrowly in evaluating the role of various compounds in the plant organism, as it were, from the position of the plant itself," he states. "Evolution was based on very complex interrelationships between the animal and plant organisms. Experience shows that the study of the role of certain classes of natural substances acquires sense only at the level of the population, or even of the biocenosis, where the intercourse of organisms with one another with the aid of chemical signaling substances — pheromones — becomes important. However narrow the problem in the knowledge of vital phenomena with which we occupy ourselves, from the molecular level to the level of the intact organism, we must keep in our field of view all nature as a whole in all the forms of its manifestation and in all its diversity."

Anything that reliably serves plants and animals cannot but have value for Man, this value must be found and turned to the use of Man this is what the scientific communist N. K. Abubakirov believes and this is the conviction which he unswervingly follows in his activity.

The urgency of the scientific search, the up-to-dateness and novelty of the method of investigation, the careful performance of experiments, and the logic in the treatment of their results and the striving to unfailingly connect the results of theoretical investigations with the solution of practical problems — these are characteristic features of the research work of N. K. Abubakirov. In addition to cardiotonic preparations — olitoriside, erysimoside, k-strophanthin- β , apobioside, and strophanthidin acetate — fruititsin* (a sedative) and psoralen and psoboran (photosynthetizing preparations) have been obtained under his direction and with his direct participation. For the development of new effective drugs and their introduction into the medical practice, Doctor of Chemical Sciences N. K. Abubakirov was one of the first persons in the Republic in 1977 to be awarded the Beruni State Prize of the Uzbek SSR in the field of science and technology.

The name of Professor N. K. Abubakirov is well known outside our country, as well. His scientific papers are published abroad. He frequently delivers lectures on his investigations at All-Union and international conferences and symposia. The researches which he performs steroid compounds are a component part of the "Steroids" section of the scientific commission on "Physiologically Active Compounds" and have been adopted for coordination within the framework of the many-sided cooperation of the Academies of Sciences of the Socialist countries. Nail' Kadyrovich is a member of the international guiding council on this subject.

Professor Abubakirov devotes much time and effort to the training of young scientists. Young people from the fraternal socialist republics are always working for periods in his laboratory. Among the candidates of science that he has prepared there are young scientists from Kazakhstan, Georgia, Kirgiziya, and Turkmenia. Nail' Kadyrovich not only readily shares his rich scientific experience with young people but he attempts to foster in them a breadth of ideas, a high understanding of their civil and social role, and an active attitude to life.

"A man who has devoted himself to science must be widely educated," he informs his pupils, "when your mental world is narrow, so will your scientific interest be." A new idea tending far into the future needs, above all, a wide-thinking man developed in many directions. Literature, music, and painting strikingly fuse in the consciousness of a scientist into scientific concepts and ideas. Remember the words of Einstein: "in scientific thought there is always an element of poetry. Modern music and modern science require the same type of mental process." And also: "Moral purity, the ability to resist personal advantage and a consumer's attitude to life are highly valued qualities and are necessary both for the professor and for the young scientific worker..." As Nail' Kadyrovich advises his students, he himself follows these principles undeviatingly. The range of his interests is very wide.

The fruitful scientific research activity of N. K. Abubakirov is successfully coupled with active and many-sided social work. He has been elected to the leading party organs of the Academy of Sciences of the Uzbek SSR and of his Institute. He is doing great work in the Republican section of the Soviet Committee of War Veterans. He frequently publishes interesting popular scientific papers in the periodical press and gives lectures on political and scientific subjects. He is a member of the Council of the Academy of Sciences of the Republic on

*As in Russian Original — Publisher.

the publication of popular scientific literature and is a member of the editorial board of the All-Union journal "Khimiya Prirodnikh Soedinenii" ["Chemistry of Natural Compounds"]. His many-faceted scientific and social activity has been recognized by the Certificate of Honor of the Supreme Soviet of the Uzbek SSR, and he is a Corresponding Member of the Academy of Sciences of the Uzbek SSR.

For a scientist, the age of 60 is the age of maturity. Much work lies ahead of Nail' Kadyrovich Abubakirov. Such people cannot rest on their laurels. "My youth was spent in War, and I frequently think in military terms," says this scientist. "Both in military matters and in science it is not always given to command armies, corps, or divisions. But if you have even a single trench it must be in the front line.