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3 января 2022

Personality in genetics: 20-30s of the XX century
(*"Golden Age" of Russian Genetics – from Vavilov to "Vavilovia the Beautiful"*)

TIMOFEEV-RESOVSKY NIKOLAI VLADIMIROVICH.
NIKOLAI VLADIMIROVICH TIMOFEEV-RESOVSKY IN THE USSR AGAIN

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Timofeev-Resovsky Nikolai Vladimirovich (1900-1981) - biologist, geneticist; Doctor of Biological Sciences.

Nikolai Vladimirovich Timofeev-Resovsky was born in Moscow on September 7 (20), 1900. In 1917, Timofeev-Resovsky entered the Natural Department of the Faculty of Physics and Mathematics of Moscow University. With breaks in 1918-1919 associated with the service in the Red Army, he studied and worked at the University until 1925.

Even in his student years, N.V. Timofeev-Resovsky began his scientific and pedagogical activity: 1920-1925. - teacher of biology at the Prechistensky working faculty in Moscow; 1922-1925 - Researcher at the Institute of Experimental Biology under the direction of N.K. Koltsova and teacher of zoology at the biotechnical faculty of the Practical Institute in Moscow; 1924-1925 - assistant at the department of zoology under prof. N.K. Koltsov at the Moscow Medical Pedagogical Institute; 1921-1925 - Researcher at the Institute of Experimental Biology as part of the State Scientific Institute under the People's Commissariat of Agriculture (GINZ). Since 1922, he became a member of the Commission for the Study of Natural Production Forces (KEPS) at the Academy of Sciences.

At the invitation of the director of the Berlin Brain Institute, Professor Oskar Vogt and on the recommendation of N.K. Koltsov and People's Commissar of Health N.A. Semashko in 1925 N.V. Timofeev-Resovsky was sent to Berlin, where he created the Department of Genetics and Biophysics at the Institute for Brain Research in the vicinity of Berlin - Buch.

In 1935, he published (together with K. Zimmer and M. Delbrück) the classic work "On the nature of gene mutations and the structure of the gene", which became an important milestone in the development of the biophysical and molecular approach to the problems of genetics.

Timofeev-Ressovsky's research activity in pre-war Germany made a fundamental contribution to a number of areas of modern biology. Here he discovered and substantiated the fundamental principles of modern developmental genetics and population genetics. He also took part in laying the foundations of modern radiation genetics.

In 1937, Nikolai Vladimirovich received an order from the official Soviet authorities to return to the USSR, but N.K. Koltsov warned him that he would most likely be arrested in the USSR, and Timofeev-Resovsky refused to return to the Soviet Union. In 1945, the NKGB arrested Timofeev-Resovsky in Berlin and deported him to the USSR. The military collegium of the Supreme Court of the RSFSR sentenced him to 10 years in prison as a defector, and he was sent to the Karaganda camp - "Karlag". When they found him, he was dying of starvation. As a specialist in radiation genetics, he was removed from the camp to work at Site 0211 on radiation safety issues. In 1947-1955. N.V. Timofeev-Resovsky headed the biophysical department of Laboratory "B" in Sungul in the Urals.

In 1956 N.V. Timofeev-Resovsky in Sverdlovsk at the Institute of Biology of the Ural Branch of the USSR Academy of Sciences created a laboratory of biophysics. At the same time, he lectured at the Faculty of Physics of the Ural University (1955-1964). Timofeev-Resovsky defended his doctoral dissertation in Sverdlovsk only in 1963. In 1964, N.V. Timofeev-Resovsky was invited to Obninsk (Kaluga region), where he organized and headed the Department of General Radiobiology and Genetics at the Institute of Medical Radiology of the USSR Academy of Medical Sciences. From 1970 until his death, Timofeev-Resovsky worked at the Institute of Biomedical Problems of the USSR Ministry of Health. He took part in the development of a program of biological experiments on artificial Earth satellites, as well as in the discussion and processing of the results of these experiments.

Nikolai Vladimirovich Timofeev-Resovsky - full member (academician) of the German Academy of Naturalists in Halle (GDR) - Leopoldina; honorary member of the Italian Society of Experimental Biology (Italy); honorary member of the Mendelian Society in Lund (Sweden); honorary member of the British Genetic Society in Leeds (UK); laureate of medals and awards Lazzaro Spallanzani (Italy), Darwin (GDR), Mendelev (Czechoslovakia and East Germany), Kimberovskaya (USA).

Nikolai Vladimirovich Timofeev-Resovsky died in Obninsk after a serious illness on March 28, 1981.

Timofeev-Resovsky was posthumously rehabilitated only in 1992.

Biography of N.V. Timofeev-Resovsky was the basis for Daniil Granin's documentary novel "Zubr".

Certificate of the researcher of the Institute of Experimental Biology Timofeev-Resovsky N.V. for a business trip to Germany for a period of 1 (one) year for scientific work at the Neurobiological Institute in Berlin. May 11, 1925

The twenties were followed by the infamous 30s, when not only people, but also some areas of science were subjected to repression. Genetics was then considered the most provocative and ideologically unsustainable. And along with her cybernetics. What are these sciences whose laws do not obey the decrees of the Party? However, what scientists are, such is science, the fathers of the nation reasoned and undertook to re-educate the obstinate know-it-alls. What are they worth without their laboratories, for example? But more often they resorted to more reliable methods of influence: exile, hard labor. And, as the most reliable - executions.

Many were swept away then by fate. But there is an amazing example of when knowledge really was a power that turned out to be too tough even for such monsters of that time as Stalin and Hitler. In 2010, this incredible man would have turned 110 years old. Compatriots first learned about him from the novel by Daniil Granin, written immediately after the start of perestroika. The title of the novel accurately characterizes the personality of the protagonist. The novel is called "Zubr", the name of the hero is Nikolai Vladimirovich Timofeev-Resovsky. He entered the history of science as one of the founders of such areas as molecular biology, radiation genetics, and radiobiology. He was an extraordinary personality, titanic, bright and free! There were no iron "curtains" for him and could not exist.

When the novel was published, and thousands and thousands of people learned about Timofeev-Resovsky, many thought that the hero of the novel was a collective image. Although, of course, that was not the case at all.

There were legends about Timofeev-Resovsky. In 1925, as one of the world's leading geneticists, he was invited to Germany to "advance science" together with his German colleagues. Meanwhile, "dark days" began in Russia: two brothers of Nikolai became victims of repression

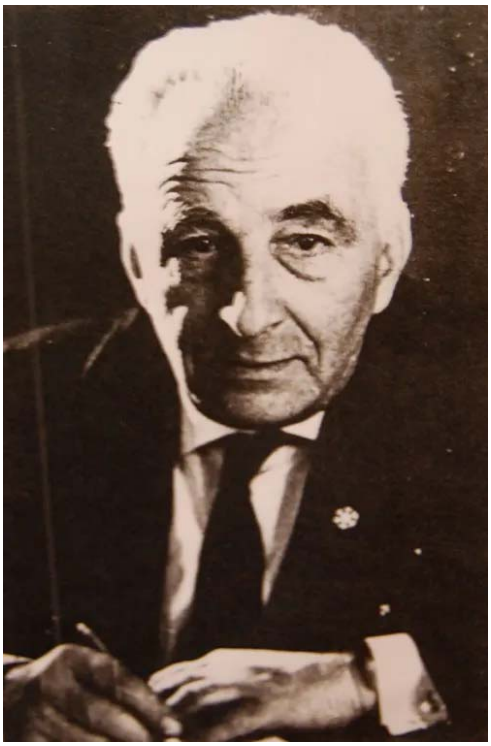
Vladimirovich, who were shot. Realizing that the same fate threatened him, he preferred science to death. And he stayed in Germany.

During the war years until 1945, the scientist continued his scientific research, remaining a citizen of the USSR, about which he liked to publicly remind others. They say that when Berlin turned to dust under the rain of Soviet bombs, Timofeev-Resovsky went out under this very "rain" and bawled Russian songs. And no one dared to stop him. They also say that not only the house where this frantic Russian lived, but also the institute where he worked, the bombs flew around as if they were being charmed.

It was in 1945, immediately after the war, that Timofeev-Resovsky decided to return to Russia, although it was clearer than ever what a tasty prey he would become for the "organs".

The Soviet rulers solved the problem of selection in a fundamentally different way than the Germans: they filled the gas chambers, in their opinion, with inferior human material so as not to spoil the offspring. Our geneticists from power destroyed the best.

It is clear that in the homeland of the scientist, the wide-open gates of Butyrka were waiting, where he arrived in what he was.



Having not lived in Russia for a long time, Timofeev-Resovsky did not even know how to behave during interrogation, and tried to turn him as a joke. From the outside, his conversation with the investigator looked more like an interview of a certain gentleman with an annoying journalist. He shoved a piece of paper to the gentleman and demanded an "autograph", which, under the conditions of this conversation, would mean that the "interviewee" was an English spy. Timofeev-Resovsky was not a spy. However, having entered the position of an investigator, he graciously agreed to a compromise: he would sign his autograph in exchange for recognizing him as a Chilean spy. He doesn't care what people say about him after his death.

In order not to waste time in prison, Timofeev-Resovsky suggested creating an institute right there.

But the real work took place in a laboratory hidden in the Ilmensky reserve in the Urals. Soon, information was leaked to the people about who was in charge of this secret laboratory, and walkers were drawn to the unwitting hermit. To get to the teacher, they had to overcome the mountain pass on foot. Only at the Timofeev-Resovsky station, and nowhere else, could one hear lectures on genetics and the theory of microevolution.

In science. In his laboratory "on chicken legs" he dealt with the issue of water and soil decontamination. Thirty years later, it was these developments of his that were used to clean the soil and water in the area of the Chernobyl nuclear power plant accident.

When in the 50s there was a huge leak of radioactive waste at one of the enterprises near Chelyabinsk, Timofeev-Resovsky proposed to organize a radiological center in this region to study the problems of radioactive contamination. Moreover (how unpatriotic!) - to make this radioactive reserve available for study by specialists from all over the world. Well, the academician of six academies of the world did not

understand that radiation has specific features for a given region: it is "limited" by political principles.

Bogdanov, Doctor of Biological Sciences, who knew Timofeev-Resovsky well, and who happened to work at the famous Ural biological station of the scientist, says that Timofeev-Resovsky was unique precisely because he was not only a great scientist. At the far Ural station, he told young talents not only about genetics, but lectured about Levitan, the Impressionists, music and the Wanderers. Real science is the privilege of only people who are very healthy in spirit and body, he would l is convinced of this.

It was his colossal erudition that allowed him to talk about environmental problems associated with human economic activity long before the visible reasons. Whether humanity wants it or not, the scientist said, he would have to deal with the problems of the biosphere, connected with the need for a general increase in the bioproductivity of the earth.

It is customary to think that science explains something, and that science is knowledge, he told his students. But science and knowledge are different things. In the history of mankind there were quite a few truly great scientists who claimed that science does not provide any real knowledge. It only helps to organize our information about the world,

Timofeev-Resovsky died in 1981. Unforgiven. Unrehabilitated. Such is it, Soviet genetics.

Deciphering the genetic code of a human chromosome can lead to unpredictable results. Unpredictability - in people who will get this knowledge. Just think - to read the genome of a single person, as they say, it will take 100 years! Who knows what all this "complex" and "complex" public is capable of? Now, if the genes of Timofeev-Resovsky and "connect" to the genes of Ivan Ivanovich.

Parents:

Father - Vladimir Viktorovich Timofeev-Resovsky (1850-1913), a railway engineer.

Mother - Nadezhda Nikolaevna, nee Vsevolozhskaya (1868-1928).

The Timofeev-Resovsky family goes back in one line to the Petrovsky nobles of the "8th class" Timofeev, in the other line - Resovsky (Ryasovsky) - comes from the clergy.

Studies:

1911-1913 - in the Kiev I Imperial Alexander Gymnasium.

1914-1917 - at the Moscow Flerovskaya gymnasium.

1916-1917 - at the Moscow Free University named after A. L. Shanyavsky.

1917-1922 - at the First Moscow State University. Didn't get a university degree.

During the years of the Civil War, he studied irregularly, because he fought in the Red Army and suffered from typhus.

In 1920-1925 he was a teacher of biology at the Prechistensky Workers' Faculty in Moscow.

In 1922-1925 he worked as a researcher at the Institute of Experimental Biology under the direction of N. K. Koltsov. Lecturer in zoology at the biotechnical faculty of the Practical Institute in Moscow.

1924-1925 Assistant at the Department of Zoology under prof. N. K. Koltsova at the Moscow Medical Pedagogical Institute.

1921-1925 Researcher at the Institute of Experimental Biology as part of the State Scientific Institute under the People's Commissariat of Agriculture (GINZ).

Work:

From the beginning of the 1920s, he participated in the work of an informal seminar organized by the group of S. S. Chetverikov at the institute of N. K. Koltsov ("Drozsoor", or "joint yelling about Drosophila"), from which many Soviet geneticists came out.

After a year of work in the genetic laboratory of the Institute of Experimental Biology, Nikolai Vladimirovich obtained interesting scientific results: studying the mechanisms of gene manifestation, he came to the conclusion that a single mutation can cause multiple changes in the appearance of an organism.

As a talented and promising researcher, in 1925 he was recommended by N.K. Koltsov and N.A. Semashko to Oscar Vogt to work in the brain research laboratory he created in Berlin.

In 1925, at the invitation of the German Kaiser Wilhelm Society, Timofeev-Resovsky and his wife moved to work in Berlin. At first he worked as a research assistant, but soon became head of the department of genetics and biophysics at the Institute for Brain Research in the Berlin suburb of Buch.

In the 1930s, together with the future Nobel Prize winner Max Delbrück, Timofeev-Resovsky created the first biophysical model of the gene structure and proposed possible ways to change it. In the late 1930s, he took part in the seminars of the Niels Bohr group and, together with B. S. Ephrussi (supported by the Rockefeller Foundation), gathered a small international seminar of physicists, chemists, cytologists, geneticists, biologists and mathematicians who discussed fundamental problems genetics and theoretical biology. Later informal schools on genetics were held wherever he worked.

In the spring of 1937, the Soviet consulate refused once again to renew Timofeev-Resovsky's passports - thereby urging them to return to the USSR. However, according to Timofeev-Resovsky, N. K. Koltsov warned him that "big trouble" would most likely await them upon their return. In 1934, 1937 and 1938, two brothers of Nikolai Vladimirovich - Dmitry and Vladimir - were arrested on various matters and shot in 1938.

Timofeev-Resovsky refused to return to the Soviet Union and continued to live and work in Nazi Germany, for which, after the Second World War, he was convicted in the Stalinist USSR for treason as a defector.

Timofeev-Ressovsky's research activity in pre-war Germany made a fundamental contribution to a number of areas of modern biology. Here he discovered and substantiated the fundamental principles of modern developmental genetics and population genetics. He also took part in laying the foundations of modern radiation genetics.

During World War II, Timofeev-Resovsky's son Dmitry became a member of an underground anti-Nazi organization called the "Berlin Committee of the All-Union Communist Party of Bolsheviks", created by N.S. Bushmanov. Dmitry was arrested by the Gestapo and died in a concentration camp. Nikolai Timofeev-Resovsky himself issued various certificates to the "Ostarbeiters" who fled from the factories.

In the spring of 1945, Timofeev-Resovsky refused the offer to transfer his department to the west of Germany and retained the entire staff and equipment until the arrival of Soviet troops. In April 1945, the Soviet military administration appointed him director of the Institute for Brain Research in Buch (after the flight of the former director, Professor Spatz, in the spring of 1945).

On September 13, 1945, Timofeev-Resovsky was detained by the task force of the NKVD of the city of Berlin, transferred to Moscow and placed in the inner prison of the NKGB.

On July 4, 1946, the military collegium of the Supreme Court of the RSFSR sentenced him to 10 years in prison on charges of treason.

He served time in one of the Ural camps of the Gulag. But in 1947, in connection with Soviet work on the creation of an atomic bomb, as a specialist in radiation genetics, Timofeev-Resovsky was transferred from the camp to "Object 0211" in the Chelyabinsk region (now the city of Snezhinsk) to work on radiation safety problems. By this time he was dying of starvation. Since 1947, Timofeev-Resovsky was in charge of the biophysical department of "Object 0211", in 1951 he was released from prison, and in 1955 his criminal record was expunged. In 1955, he signed the Letter of Three Hundred.

In 1955-1964, Timofeev-Resovsky headed the Department of Biophysics at the Institute of Biology of the Ural Academy of Sciences of the USSR in Sverdlovsk. At the same time, he read several series of lectures on the effect of radiation on organisms and on radiobiology at the Faculty of Physics of the Ural University and worked at a biological station he founded on Bolshoye Miassovo Lake in the Ilmensky Reserve.

Timofeev-Resovsky was able to defend his doctoral dissertation in Sverdlovsk only in 1963, and received his doctoral degree in 1964 after the dismissal of Khrushchev and the rehabilitation of genetics.

In 1964-1969, Nikolai Vladimirovich headed the department of radiobiology and genetics at.

Since 1969, Timofeev-Resovsky worked at the Institute of Biomedical Problems in Moscow.

His incredibly complex and unique biography was the basis for the documentary novel Zubr by Daniil Granin. The history of the laboratory in Berlin-Buch is the basis of Elly Welt's novel Berlin Wild, where all the participants, although quite recognizable, are bred under fictitious names. The record library in the city of Pushchino-on-Oka holds a collection of tape recordings with oral stories by N. V. Timofeev-Resovsky, some of which have been published in the form of memoirs.

In 1987, after the publication of the novel by Daniil Granin, the youngest son of Timofeev-Resovsky Andrey and representatives of the scientific community demanded the rehabilitation of the outstanding geneticist. But the Main Military Prosecutor's Office, after an additional investigation, instead of rehabilitating the scientist, put forward a new charge that was not imputed to him either by the investigation or by the Military Collegium in 1946 - going over to the side of the enemy - and in July 1989 issued a decision to terminate the proceedings due to the lack of grounds for rehabilitation of Timofeev-Resovsky. The decree stated that Timofeev-Resovsky, personally and together with his colleagues, was actively engaged in research related to improving the military power of Nazi Germany, which committed treason to the Motherland in the form of going over to the side of the enemy.

On February 4, 1991, the USSR Prosecutor's Office canceled this decision of the Chief Military Prosecutor's Office on the grounds that the conclusion that Timofeev-Resovsky was conducting scientific research of military importance was not sufficiently substantiated and instructed the Investigation Department of the KGB of the USSR to conduct another additional investigation. As follows from the certificate of the Investigation Department of the KGB dated October 16, 1991, according to its results, “no additional information was received regarding the corpus delicti charged by Timofeev-Resovsky.”

On October 16, the Prosecutor General of the USSR filed a protest in the case to the Plenum of the Supreme Court of the USSR for the termination of the case due to the absence of corpus delicti in the actions of Timofeev-Resovsky. However, the protest was not considered in connection with the liquidation of the Supreme Court of the USSR. Timofeev-Resovsky was rehabilitated only in June 1992 by the Supreme Court of the Russian Federation.

The medal, instituted in memory of an outstanding natural scientist, is awarded by the Scientific Council of the Center to Russian and foreign scientists for achievements in the field of radiobiology, radiation genetics, evolutionary science and environmental protection. The honorary

list of those awarded with the medal includes 35 names. In accordance with the decision of the General Conference (November 11, 1999), UNESCO took part in the celebration of the 100th anniversary of the birth of N.V. Timofeev-Resovsky in 2000.

Of particular note are Timofeev-Ressovsky's merits in the field of genetics, radiobiology, local and continental radioecology, and evolutionary studies. These areas of knowledge have received wide recognition from scientists around the world. At the same time, until now, the layer of natural science knowledge raised by him in the field of theoretical biology and space ecosystems continues to remain out of sight. The problem of eternity, which characterizes the interaction of the biosphere and humanity, deserves special attention. Nikolai Vladimirovich formulated it while working at the IMR of the USSR Academy of Medical Sciences (1968) and to this day it attracts human minds, providing an boundless field for research. In 2000, the name of N.V. Timofeev-Resovsky, in connection with the 100th anniversary of his birth, by decision of the General Conference of UNESCO, was included in the annals of international memorable dates for 2000-2001.

Membership in scientific societies and scientific awards:

Active member (academician) of the German Academy of Naturalists in Halle (GDR) - Leopoldina.

Honorary Member of the American Academy of Arts and Sciences in Boston (USA).

Honorary Member of the Italian Society of Experimental Biology (Italy).

Honorary member of the Mendelian Society in Lund (Sweden).

Honorary Member of the British Genetic Society in Leeds (UK).

Honorary member and founding member of the All-Union Society of Geneticists and Breeders. N. I. Vavilova (USSR).

Scientific member of the Max Planck Society (Germany).

Full member of the Moscow Society of Naturalists, the All-Union Geographical Society, the All-Union Botanical Society.

Laureate of medals and awards Lazzaro Spallanzani (Italy), Darwin (GDR), Mendelev (Czechoslovakia and East Germany), Kimberovskaya (USA).

Valery Soifer

Communicating during student holidays with Professor Sergey Sergeevich Chetverikov in the then city of Gorky, and during study time in Moscow with Academician Igor Evgenievich Tamm, I heard from them the name of Nikolai Vladimirovich Timofeev-Resovsky (I will continue to write T.-R.). In the 1920s he was a student of Chetverikov and since 1925 he lived in Germany, where he ended up under non-trivial circumstances. After Lenin's death, someone in the Soviet government decided that he must have a specially arranged genius brain (soon, however, it was found that the tissues of Lenin's brain were irreversibly deformed and even reduced as a result of a serious illness). Oskar Vogt, the director of two German institutes, the Kaiser Wilhelm Brain Research Institute and the Neurological Institute at the University of Berlin, was invited to the USSR from Germany. As Chetverikov told me, Vogt, having arrived in Moscow at the beginning of 1925, agreed to help organize a comprehensive study of Lenin's brain in the USSR, but for now, without putting things off the table, he offered to start the necessary research in Berlin. According to the staff of the Institute of the Brain in Moscow today, Lenin's brain is still stored in their building in room number 19.

Vogt was so inspired by Chetverikov's achievements in genetics that he asked him to recommend one of his students to move to Berlin for a while in order to raise the level of genetic research in Germany. Chetverikov told me that he had announced such a possibility, and his student Kolya T.-R. expressed a desire to go to Germany with his wife Elena Alexandrovna (nee Fidler), whom her husband called Lelka for decades. Soon another of his closest students, Sergei Romanovich

Tsarapkin, went to Germany under the patronage of Chetverikov. These negotiations and recommendations of Sergei Sergeevich are also evidenced by his letter to Vogt, sent on June 3, 1926.

According to various reminiscences, since the mid-1930s, T.-R. more than once tried to return to the USSR. But he was sent by diplomatic mail (as T.-R. told me, through the Swedish ambassador) a letter from N.K. Koltsov, in which the teacher warned the student that after his return, better to stay in Germany. Now there are indications that N.I. Vavilov also transmitted T.-R. similar advice. As a result, T.-R. with his wife and son, just like the Tsarapkins, lived in Germany until the end of World War II.

T.-R. during his years in the West, he became a well-known geneticist, especially in the field of radiation and population genetics, established friendly relations with many scientists, including Niels Bohr. At first, he simply used radiation as a tool for inducing mutations, then he became involved in the study of the damaging effects of radiation. His closest friend Nikolaus Riehl (the son of a German engineer who was invited by Siemens to work in Russia at the end of the 19th century and married a Russian woman) studied until 1927, first at the St. Petersburg Polytechnic University, and then at the Humboldt University of Berlin. He was a specialist in nuclear chemistry, involved in the German project to create an atomic bomb, and often visited the Timofeevs at home, where they talked on a wide range of scientific and human problems. Thus, let formally T.-R. and was not involved in the German uranium project, but he had a very close acquaintance with this project, especially since his studies of the processes of damage to the hereditary structures of living organisms by various types of radiation were important to nuclear physicists. Working together with T.-R. in Berlin, I. B. Panshin testified that immediately after the war, Riehl transferred to the USSR a huge amount of information about German atomic developments and was immediately included in the Soviet atomic program (he was even awarded the title of Hero of Socialist Labor, twice he was awarded the Stalin Prize, and then the Lenin Prize ; after a ten-year stay in the USSR, he repatriated to Germany). Beria's deputy for the management of the Soviet atomic program of the USSR A.P. Zavenyagin knew T.-R. and when he, sentenced to ten years and placed in a prison camp, was already close to death, ordered in 1947 to transfer him from the camp (Timofeev once told me that he was at that moment in a camp in the Pamirs) to the location of the "sharashka" in Sungul near Kasli in the Urals, where the Soviet authorities since 1946 began to deploy a scientific center as part of the Soviet atomic program. A plutonium production plant was built here, later called the Mayak Combine. Not far away, in the center of the Ilmensky Reserve, a secret camp for imprisoned scientists, “sharashka”, was also created, where they brought the barely alive T.-R. ("He could not stand on his feet, he was carried into the corps on a sheet"). In this "sharashka" were not only Russians, but also captured German scientists who once worked with T.-R. in Germany - Karl Zimmer, Nikolaus Riehl, Hans Born, Alexander Kach and others.

When I heard about T.-R., I was inspired by the dream of getting a summer internship in his laboratory, which I told both Tamm and Chetverikov. Students of the Department of Biophysics of the Faculty of Physics of Moscow State University, where I moved in December 1957 from the Timiryazev Academy, wanted to go with me - Valery Ivanov, Andrey Malenkov, Andrey Morozkin and my closest friend from Timiryazevka Sasha Egorov. Thus, I managed to put together a company of five people.

But how to get there? Tamm was familiar with T.-R. (in 1956 he invited him to come from Sverdlovsk, where he was in charge of a laboratory as part of the Ural branch of the USSR Academy of Sciences, to Moscow for Kapitsa's seminar at the Institute of Physical Problems and spoke with him at a huge gathering of people, causing a surge of rage in Lysenko, about which he told me told at one of our meetings), but Tamm had no direct connection with him, and he could not help in organizing the trip. True, Igor Evgenievich immediately told me that he would give Sasha Yegorov and me money

for railway tickets from Moscow to the Urals and back and for our life in the Urals, for which I was very grateful to him.

Therefore, it was necessary to get through to T.-R. in some other way, but I did not know how to do this. Shortly after I shared this dream with Chetverikov, I received from him a caring, completely native letter in which my desire was approved. He wrote to me, in particular:

Dear Valery Nikolaevich! You must feel how deeply and ardently I must be interested in your own fate and the work you have undertaken. I have become very attached to you and every event in your life, every success or failure, makes me deeply happy or sad; therefore, do not forget me, the old man, and although I cannot provide you with almost any direct business support, let your soul feel that somewhere out there, in Gorky, there is a person who is closely and with great participation following your fate…

Sincerely loving you
WITH. Chetverikov

Later I learned that Chetverikov wrote to T.-R. a letter with a request to accept us for practice.

A month later, a letter came from Chetverikov (dated May 28, 1958), in which he said that T.-R. "I heard something good about physics students in Moscow from Academician Tamm" and agrees to host us at the summer base in the Ilmensky Reserve. We got ready for the road and on July 2, 1958, and early the next morning, we reached Miass. There we found the building of the directorate of the Ilmensky Reserve, asked if they had any information about the car that they were supposed to send for us from the biological station, and found out that there was no car and no one had heard anything about it. After that, we threw our backpacks behind our backs and set off on foot through the reserve along the road indicated to us. We had to walk something about 15 km, it was early in the morning, and we decided that we would get to the place by lunchtime.

About three hours later we reached the bank of some narrow river and decided to have a short respite and breakfast here. I have photographs of that breakfast, as well as a picture of Sasha Yegorov, who, bowing his head to the river, drank water from it.

By lunchtime, we actually made it to the biostation, where we were already worried about where we had gone. Nikolai Vladimirovich came out to us, who, despite the clouds of mosquitoes, flaunted his naked torso, exposing his heroic chest with gray hair to the fresh air and the sun. His first question, in an anxious and commanding tone, was whether we stopped on our way to the station, and if so, where. When I told how we made a halt on the bank of some river, he became noticeably worried.

I hope you did not drink water from this river? he asked me.

How could they not drink, drink, and how! - not understanding his anxiety, I answered.

My words greatly alarmed Nikolai Vladimirovich. It was only after a while that I realized what it was. It turns out that the Techa River flowed through the Ilmensky Reserve, in the upper reaches of which secret cities were built with enterprises for obtaining enriched nuclear fuel and fuses for atomic bombs, and all waste was poured into this river for years, so the level of radioactivity in those places is thousands of times, and sometimes and exceeded the maximum allowable dose for humans. In 1957, a year before our arrival, there was also a large-scale "Kyshtym" accident at the Mayak plant, which reverberated throughout the planet, when one of the storage facilities for highly concentrated radioactive waste with more than 20 million curies blew up. The particles shot up into the atmosphere formed a monstrous radioactive cloud and additionally polluted the Techa River. The defeat covered a vast territory of 23 thousand km 2 (the so-called East Ural radioactive trace arose), radioactive fallout reached France and Sweden. It was dangerous to drink water from the river, but it was done.

The main scientific problem studied by the staff of Nikolai Vladimirovich was just the damaging effect of radiation. Later, he presented me with a thick collection of works from his laboratory, published by the Ural Branch of the Academy of Sciences with a dedicatory inscription, containing mainly radiobiological research. Apparently, his laboratory remained the only center in the country where they did not stop doing real genetics. The work was carried out under the patronage of nuclear physicists, the laboratory was classified, and physicists were well aware that radioactive exposure required real genetic analysis.

A few years later, a trip to T.-R. I ended up at dinner next to Dr. G. A. Sereda. In a conversation, I mentioned the name of Nikolai Vladimirovich, and suddenly Sereda told me that he knew him very well, since he was the director of an extremely secret scientific institution in which Timofeev worked. He told me that T.-R. he was completely unable to keep the state secrets communicated to him, and when Sereda handed over the secret research plan that his group would have to deal with, he found out after a few days that secret information had been communicated to all members of the group and spread throughout the facility.

Nikolai Vladimirovich told me, - said Sereda, - that without getting acquainted with the general plan of the study, it is impossible to expect interested and thoughtful work from the employees. That each participant should know what to strive for and what is the ultimate goal of the work.

Sereda also told me about one curiosity. Before the new year, team leaders were ordered to apply for instruments and chemicals needed for the coming calendar year. T.-R. also submitted such an application, indicating 15 grams of one of the dyes for cytological studies. This dye was not produced in the USSR, but since the secret "sharashka" was assigned to the highest state category, applications from it were considered absolutely necessary. The typist, who finally retyped the summary table, instead of the abbreviation "g" put the icon "t" (that is, "tons"). The summary data was not given to anyone for verification, by the required date a special line was erected at another secret

enterprise for the production of the desired compound, and a separate wagon loaded with fifteen tons of dye went to the Urals. Such an amount of paint was not needed on a global scale, with the help of this “chemical muck” it was possible to paint all the rivers and lakes on Earth.

So, back to the story of our arrival in Miasovo. We were shown a site not far from the shore of the lake where we had to set up a tent, we set it up, and our wonderful practice began. The next morning, Nikolai Vladimirovich began by giving us a lecture on nature conservation. In those years, Michurin’s slogan “We cannot wait for favors from nature, it is our task to take it from her” still dominated the country, and nature was spoiled on a national scale (which, however, is not comparable to today's pollution). T.-R. even then he realized the destructiveness of such an approach, angrily and colorfully narrated about the capital consequences of the thoughtless destruction of forests for centuries, washing away and damage to soils, massive water pollution. It is not surprising that one of his wards - Alexei Vladimirovich Yablokov - later became such a passionate fighter for the environment.

T.-R. (right) preparing to swim in Lake Miasovo
(photo first published in "A Very Personal Book" by V. Soifer, 2011, p. 277)

A day later, Timofeev showed us how to grow fruit flies, how to prepare food, how to euthanize flies with ether, and how to count mutations. In the next session, he gave an overview of the main types of mutations in Drosophila, then spoke about the giant salivary gland chromosomes, and showed us how to prepare preparations of these chromosomes. The workshop was interesting and useful. On July 8, he began to give us a genetics course of 15 lectures. Each lecture took a total of two hours (sometimes a little more) and was given every other day, and in the intervals between them, Alexei Andreevich Lyapunov, professor of mathematics from Moscow State University, began to read a course of lectures on mathematical group theory, set theory and their role in cybernetics. At that time, in the USSR, cybernetics, just like genetics, was banned, and Lyapunov showed courage by popularizing the forbidden science (he became perhaps the most prominent mathematician who openly and honestly defended this science) and at the same time developing the scientific foundations of this discipline. So we are very lucky in that regard.

Lectures by T.-R. included the following sections (I will list them all as he himself formulated them, although I understand that many readers will not be familiar with all the terms):

1. Cytology of heredity. Meiosis. Mitosis. Phases of the cell cycle, the process of identical reproduction, gender equality in heredity. Mendel's rules.
2. Development of traits of organisms, polygenicity of many traits, gene and potency of trait development, sex-linked traits, reciprocal crosses, interaction of autosomes and heterochromosomes, the possibility of chemical sex change in fish.
3. **Crossing over. Crossover interference. Interaction of genes and traits (physiological or phenotypic genetics). *bar*- mutations in Drosophila and unequal crossing over. position effect. "Each gene is in combination conditions fields of activity neighboring genes," he said.**
4. Phenomenology of gene expression. Penetrance (% of gene expression) and expressivity (degree of expression of a trait). Expression of a trait in monoploidy, diploidy and heteroploidy. lethal effects. Pleiotropy and polarity in the variability of elementary characters.
5. Sectoriality of somatic mutations. Morphogenetic relationships, the role of hormones and other substances in the expression of genes.
6. mutation process. The role of inbreeding in the detection of true mutations. Clean lines. Genetic bases of selection of varieties.
7. Factors affecting the occurrence of mutations in spontaneous mutagenesis. Rates of evolution and rates of mutation. Chetverikov's ideas on the accumulation of recessive mutations in genomes. Activation factors for spontaneous mutagenesis. Chromosomal mutations in Drosophila. Genomic mutations.
8. The role of heterochromatin in chromosome elongation. Analysis of the mutation process by laboratory methods. Target theory. Curves "effect - dose". Time effects of mutagens application. Saturation curves.
9. Back mutations. Types of ionizing radiation (electrons, neutrons, protons, deuterons and alpha particles). Photoprocesses. Linear density of ionizations and impact effects. Formal effective lesion volume and absorption energy.
10. Spontaneous mutation process and microevolution. Prophetic views of S. S. Chetverikov on the role of the accumulation of recessive mutations in evolution. After how many divisions can the effect of mutations be revealed at the phenotypic level? Stability of genetic structures and external factors (in particular, temperature).
11. Possible ways of genotype evolution. The presence of data that contradict the idea of a chromosome as a carrier of a continuous hereditary molecule (a continuum of genes). Allelism, homologous attraction during conjugation. Gradual violation of the homology of chromosomes in evolution. Step alleles and pseudo alleles.
12. Microevolution. Intraspecific struggle. Quantitative analysis of genomic transformations according to Chetverikov. The main results of the study of Drosophila species in natural conditions by Chetverikov's group in the Caucasus and other species by Timofeev-Resovsky and his wife Elena Aleksandrovna in Europe.
13. Continuation of the lecture on microevolution. Elementary evolutionary phenomena. The concept of the species and the main features of species. Populations as representatives of a species in certain areas. Panmixia. stabilizing crosses.
14. Elementary evolutionary factors. Statistical nature of the evolutionary process. "Waves of Life" Chetverikov.
15. **Natural selection. Divergence of genes. Tail selection. selection rates.**

The most important feature of the lectures was that Timofeev not only tried to convey to us the main scientific ideas, but also built them chronologically and poured out the names of scientists

who entered into the study of certain processes at different times. Several hundred names were named. Since he personally met many of the named ones in the West, the story about the history of the development of genetic views appeared vivid and vivid. Nikolai Vladimirovich had no notes in his hands, he read spontaneously, but such a volume of information was retained in his memory that it became quite clear: we are facing an absolutely unique person with encyclopedic knowledge of the history of genetics, who understands the genesis of genetic views as deeply as, probably, few others in the world. He often used chalk and drew diagrams on the blackboard. It was noticeable that because of his blindness he did a lot, in fact, not seeing his drawings, but from memory, but nevertheless all the drawings and diagrams turned out to be clear and precise. Several times I visited Nikolai Vladimirovich's office in the laboratory building and saw that for reading he took a huge magnifying glass in his hands, probably twenty centimeters in diameter, and with its help he tried to read the text line by line. But he walked around the summer base without glasses, he knew how to distinguish everyone around him, and if you didn't know that he saw exceptionally badly, then it was difficult to notice his blindness.

We were so delighted with the course of lectures read to us in Miasovo that I offered to help organize a speech by Nikolai Vladimirovich in Moscow at our Faculty of Physics, Moscow State University, and also said that I was closely acquainted, probably with the most outstanding writer of that time, who published many books on the largest Russian scientists - Oleg Nikolaevich Pisarzhevsky. Three months later I received this letter:

24.XI.58

Dear Valery!

We just returned from Miasovo for the holidays, where we worked a lot and wrote with Nick. Vl. several articles. He is still busy with all sorts of things and finishing work. Therefore, I answer you.

From here we will go one of these days to Leningrad, where Nick. Vl. from 3.XII to 20.XII he will give a course on "Population Genetics and Microevolution" at the University (at the Department of Genetics) and in parallel "Fundamentals of Radiation Genetics" at the Institute of Physiology. Pavlova! We will be in Moscow from December 25 and, apparently, until January 10. At this time Nick. Vl. he will gladly read you, as he has just told me, "as many reports as you like and about anything, everything that interests you." In Leningrad, we will stop at Anna Benediktovna Gedova, B. Pushkarskaya, 34b, apt. 2, tel. V-2–51–89. Write or call us there - when you arrange the reports of Nikolai Vladimirovich.

Something strange happened with Pisarzhevsky's letter - it has been lying around in the reserve for so long that Nick. Vl. received it already here, where it was sent from Miasovo. Please apologize to Oleg Nikolaevich on behalf of Nikolai Vladimirovich and say that Nick. Vl. she really wants to get to know him and talk in detail about all sorts of things during our stay in Moscow (in Moscow we will live with Nadezhda Vasilyevna Reformatskaya (25 Kompozitorskaya st., apt. 2, vol. G-1–30–50).

Good luck. Pass on from both of us to all "biophysicists", including Ogurts and Gosh.

Yours E. Timofeeva-Resovskaya

Nikolai Vladimirovich called a cucumber a cucumber for my strong elastic figure, my friend from the Timiryazev Academy, Sasha Yegorov, who invariably enjoyed the special sympathy of a scientist.

Elena Alexandrovna did not write to me about a very important event that happened during their visit to Leningrad. At a meeting of the Academic Council of the Botanical Institute of the Academy of Sciences of the USSR T.-R. in December 1958 he defended his dissertation for the degree of Doctor of Biological Sciences (the award of this degree was prevented by the USSR Higher Attestation Commission on false political denunciations of Lysenkoites). It should be noted that in the 1950s T.-R. was nominated by several Western scientists for the Nobel Prize, but the Nobel Committee asked the Soviet government whether the scientist was alive, there was no answer from Moscow, and the issue of awarding the prize was withdrawn from consideration, because these prizes are not awarded to those who have died.

Apparently, he really wanted to speak with us at the Faculty of Physics of Moscow State University, because two weeks later I received a new letter written by Elena Alexandrovna:

Leningrad

9.XII.58

Dear Valery!

Nikolay Vladimirovich asks to write to you, that in view of the large number of lectures and reports that he will have to here to do - we will linger here for a while and will be in Moscow only 27.XII in the morning. How and when do you arrange presentations in Moscow - it depends on you - we will stay in Moscow for two weeks. See you soon. Nikolai Vladimirovich sends you and all your heartfelt greetings.

Yours E. Timofeeva-Resovskaya

The head of the Department of Biophysics of Moscow State University L.A. Blumenfeld, to whom I conveyed all the information received from the Timofeev-Resovskys, together with the assistant professor of the department S.E. took place in the Large Physical Auditorium on Sparrow Hills (it could accommodate several hundred listeners and was packed to capacity). In addition, I

arranged with Dmitry Dmitrievich Romashov, who worked in the Moscow Society of Naturalists, that the section of genetics and breeding would hold a lecture by Timofeev in their auditorium in the very center of Moscow (on what was then Herzen Street). There was great interest in both presentations.

Already after the departure of the Timofeev-Resovsky couple from Moscow to the Urals, Academician Tamm spoke with Academician of the Academy of Sciences of the USSR V. A. Engelhardt, and the two of them (knowing about the successful defense of their doctoral dissertation) nominated T.-R. Academicians of the Academy of Sciences of the USSR. But still strong in influence in the USSR, the Lysenkoites launched a stormy activity to discredit the scientist as an alleged enemy of the Soviet state. Only after the removal of Khrushchev from the position of the head of the Bolsheviks T.-R. managed in 1976 to successfully defend his doctoral dissertation on the totality of works, but he never became a member of the academy.

In 1975, the well-known geneticist Oke Gustaffson from Sweden came to the USSR (he was closely acquainted with T.-R. in previous years), I was appointed responsible for receiving Gustaffson in the USSR and suggested to the President of the Academy of Agricultural Sciences (VASKhNIL) P. P. Lobanov arrange a meeting with a Swedish scientist. Lobanov agreed, and I invited T.-R. He arrived with A.V. Yablokov and violated all the rules of the "official ceremony". Lobanov behaved perfectly, accepting without irritation all sorts of escapades of Nikolai Vladimirovich. I remember how at some point he said that scientists are just sitting on the neck of the state, and there is nothing from them except spending money not earned by their labor to satisfy internal interests. Lobanov began to object, to which Timofeev retorted with a wonderful phrase that forever burned into my memory: “Only ballet dancers, circus performers and taxi drivers earn with their work.” Everyone laughed, and the president of the academy only nodded his head sadly.

When the meeting was over, and we went out into the lobby, Timofeev and Gustaffson embraced, Nikolai Vladimirovich clung to his old friend, grabbed him by the lapels of his jacket and began to tell him (slowly choosing his words) that he was tired of living, that after the death of his wife, his existence here seems him vain and unnecessary. He cried at parting and, without wiping his tears, only repeated more than once: “I want to be with Lyol’ka” (“I want to Lyolka”). Now, left without a wife, I perfectly understand Nikolai Vladimirovich.

Valery Soifer,

doc. Phys.-Math. Sciences, foreign member of the National Academy of Sciences of Ukraine,

Honorary Professor of Moscow State University, Emeritus Professor of George Mason University (USA)

Sat. "Scientific heritage", 2002, vol. 28, ed. "Science", pp. 220–222.

On December 29, 1990, the daughter-in-law of S. R. Tsarapkina sent me the following letter in response to my request to tell more about the life of Russian scientists in Germany: “Sergei Romanovich Tsarapkin was a geneticist with a good knowledge of mathematics, especially variational statistics, which helped him a lot in his scientific work . After graduating from the university, he began working at the Institute of Experimental Biology, where he worked under the direct supervision of N.K. Koltsov. In 1926 he was seconded to Germany to work at the Brain Institute. There he met N. V. Timofeev-Resovsky, who had arrived earlier. From the very beginning, even when they studied in a group with S. S. Chetverikov, their relationship did not develop friendly, and then completely deteriorated. In 1932 T.-R. participated in the International Genetics Congress in the USA. Sergey Romanovich and other employees of T.-R. gave him their materials for presentation at the congress, T.-R. presented them on his own behalf, without mentioning other authors. After returning, a scandal erupted, even Vogt himself publicly expressed his opinion on this incident. There were other episodes that characterize the discrepancy between the opinions of Sergei Romanovich and T.-R., which led to the fact that T.-R., being the head of the laboratory, practically did not give

any opportunity to work, constantly changing and canceling the topics on which Sergei began Romanovich to work. Then these directions reappeared in the laboratory, but at the suggestion of T.-R. Due to forced circumstances, Sergei Romanovich and T.-R. ended up in one place in the USSR, in the camp and PO Box 33/6. Relations have not improved, quite the contrary. Ultimately, T.-R. received a laboratory in Sverdlovsk, and the Tsarapkin family was sent to the city of Kustanai to complete the exile. Sergey Romanovich could not do science, he worked as a teacher of all subjects. In 1957, after serving their sentence, the Tsarapkins moved to the city of Ryazan, where they were allowed to go. This link completely undermined the health of the father-in-law and on January 15, 1960, after another heart attack, he died "(quoted from a letter I have from K. A. Tsarapkina).

See an interview with him in Repressed Science, pp. 252–267.

See Uralskaya Nov magazine, 2002, No. 13.

The IV International Conference "Modern problems of genetics, radiobiology, radioecology and evolution", dedicated to the 115th anniversary of N.V. Timofeev-Resovsky and his international scientific school, worked in St. Petersburg from June 2 to 6. Within the framework of the conference, IV readings in memory of V.I. Korogodin and V.A. Shevchenko and a working meeting of the International Union of Radiobiologists "Ideas of radiobiology in radioecology: mechanisms and effects of radiation" were held. The conference brought together over 150 participants from Armenia, Germany, Kazakhstan, Canada, Norway, USA, Ukraine, France, Japan, JINR and Russian scientific centers.

N.V. Timofeev-Resovsky made a decisive contribution to the formation and development of several areas of modern biology: evolutionary and population genetics, the study of the structure of the gene, the patterns of the mutation process, radiobiology, radiation genetics and radioecology. In 1925, on the recommendation of his teacher N.K. Koltsov, he was sent to Germany to the Kaiser Wilhelm Brain Institute at the invitation of O. Vogt to "adjust" genetics there. He worked at the Institute of the Brain from 1925 to 1945, since 1936 he was the director of the department of genetics and biophysics of this institute. After returning to the USSR and being arrested in 1945, he worked in several radiobiological research centers. In the 1960s, having received permission to visit large cities of the country, he made a huge contribution to the preparation of the restoration of genetics after the period of Lysenkoism. His studies of the influence of ionizing radiation on all living things, the genetic effects of radiation laid the foundations of radiation ecology - the protection of the environment from radiation damage, formed the basis of work on genetic safety (genetic toxicology). It was Timofeev-Resovsky who defined the population as a unit of the evolutionary process, hence his interest in the genetics of populations in general and in the effect of radiation on natural populations. Scientific achievements and bright personality of N.V. Timofeev-Resovsky had a huge impact on domestic and world genetics and molecular biology. Posthumously rehabilitated.

When physicists understood biologists

The conference was opened by Academician of the Russian Academy of Sciences, Director of the St. Petersburg Branch of the Institute of General Genetics **S.G. Inge-Vechtomov**: "On behalf of Zh.I. Alferov, I greet you on behalf of the St. Petersburg Branch of the Russian Academy of Sciences, as well as on behalf of the Council for Genetics and Breeding of the Russian Academy of Sciences and the Department of Genetics and Biotechnology of St. Petersburg State University. Nikolai Vladimirovich Timofeev-Resovsky has always been known not only as a scientist, but and as a teacher, disseminator of knowledge in the field of genetics, ecology, radiobiology... I once came to Obninsk and asked Nikolai Vladimirovich. - And where he? - He lectures on ecology on a sponsored collective farm .... While working in Germany, he paid great attention to the problem of the gene, published his famous Green Notebook. He outlined the problems of biology so simply that they were

accessible to physicists. The Green Notebook produced E. Schrödinger is under the impression that at first he lectured on its basis, and later wrote his widely known book “What is life from the point of view of physics.” The significance of this conference is completely determined by the scale of Timofeev-Resovsky’s personality, about which one can talk endlessly. He stood at the origins of our genetics, and then - its revival after the Lysenko period.But the truth is not born by a majority of votes.

When Watson, Crick, and Wilkins received the Nobel Prize for the structure of DNA, they actually showed what immortality is. Immortality without any mysticism. This is the rational basis for immortality, since DNA is genes that are reproduced from generation to generation. Hence it turns out that immortality is a collective concept, although death is an individual concept.

I was lucky to see and hear Nikolai Vladimirovich, - said the chairman of the Vavilov Society of Geneticists and Breeders of Russia **N.A. Tikhonovich**. - I studied at the Department of Genetics and listened to his lectures. He was a wonderful lecturer, but also a tough opponent - then there were heated discussions about the varieties of the population. In his lectures on genetics, he wrote: "The devil's abyss of all sorts of factors, and no one knows which one to study." Since then, science has advanced. In a certain sense, Nikolai Vladimirovich can be satisfied that we are developing his teaching and that there is progress. I express my confidence that the next generations will treat the legacy of Timofeev-Resovsky with the same respect, but also critically.

The contribution of Timofeev-Ressovsky to evolution is that he discovered: at a certain stage, ionizing radiation accelerates evolution, - noted **M.Roseman** (Germany). - It was a model of neutral, natural evolution and mutation. This direction continues Mendelism. We are increasingly recognizing that there is heredity from one generation to the next, based not on mutations, but on epigenetic changes. And these mechanisms are very important for the quick response of the organism itself to the changes that occur in the environment.

The acquaintance of our family with the Timofeev-Resovskys has been going on since 1915, - the art critic began her memoirs **M.A. Reformatskaya** (Moscow). - My father and Nikolai Vladimirovich ended up at the same desk at the Flerovo gymnasium in Moscow. We became friends, appreciated each other's love of life and the ability to get involved in completely different areas. Craving for science, purposefulness in character, despite the violent manifestations of youth, were all the time indicated in their lives. Nikolai Vladimirovich left a mark on himself, even when he left for Germany in 1925. Probably, if not every day, then every week some stories connected with him were remembered. And so, in 1954, we received a letter with the postmark of a secret institution, a "post box". My father, having opened it, saw the familiar sweeping handwriting in the postscript to the main letter written by Timofeev-Resovsky's wife. The fact is that by this time Nikolai Vladimirovich, after his arrest in 1945, had passed the Karaganda camp, which few people could withstand. His powerful body and sense of humor helped to survive, but he lost his sight. "They are alive, but they cannot come to us," the father said. They received permission to come to Moscow when the "mailbox" in the Urals was closed, the laboratory was transferred to Sverdlovsk, and a wonderful auxiliary laboratory was received in Miassovo in the Ilmensky Reserve. After the work in these laboratories was established, the Timofeevs gathered in Moscow. They were met on the platform by former school friends, the meeting was absolutely wonderful, and its spirit, it seems to me, was very well conveyed in the novel "Zubr" by Daniil Aleksandrovich Granin.

The history of Timofeev-Resovsky and his family, his archives related to life in Germany, became interested in German colleagues. Sociologist and science scholar **Rose Louise Winkler**: In the mid-1970s, our Science Institute of the Academy of Sciences of the GDR conducted research at our institutes, including the Central Institute of Molecular Biology and Medicine. The biophysical research sector was headed by Professor H. Abel. So I got acquainted with Timofeev-Resovsky's laboratory, but, unfortunately, not with him personally. When we were engaged in these studies, we

did not even suspect that he was still alive, living not far from Moscow, and it would be possible to visit him. Already in 2000, when the 100th anniversary of Timofeev-Resovsky was celebrated in Berlin-Buch, Professor Abel asked me to study the fate of this family. I met my youngest son Andrei, with the people who surrounded Nikolai Vladimirovich, I realized that I needed to work thoroughly with documents.

Graduate student **Eliza Schmit** (Natural History Museum Berlin) deals with the history of science and specializes in the history of the modern theory of evolution: Before I began to deal with these issues, I thought that the modern development of biology took place in the USA and Great Britain. And while doing my research, I found out that Timofeev-Resovsky in Germany had been developing this direction a very long time ago. Arriving in Berlin in 1925, he immediately organized a seminar on genetics, in which he involved not only Russian, but also German specialists. It seemed to me especially interesting that he brought together specialists from different fields of science in one seminar to understand what evolution is. The more I study various documents, diaries, letters, the more I am surprised at how broad Timofeev-Resovsky's scientific interests were and at what high level he worked in all directions. This is quite rare today. I was especially surprised that this seminar on genetics, which was held quite regularly, published the results that were obtained in the USA many years later. And then everything was interrupted because of the war, and much was forgotten.

M. Roseman: Interestingly, Timofeev-Resovsky was invited by Professor O. Vogt, who knew that the Russian scientific school of genetics was the most advanced at that time. This was an example of the most successful brain drain to Germany, since these studies were carried out at the worst level in our country.

R.-L. Winkler, S.G. Inge-Vechtomov, M. Roseman.

M.A. Reformatskaya: It seems to me that this brain drain did a lot to save the scientific tradition, to save Nikolai Vladimirovich himself, who during the 1910-1930s was an ideal candidate for "landing".

M. Rozeman worked in the commission for the rehabilitation of Timofeev-Resovsky. Rehabilitation was required because back in the 1980s, the USSR Prosecutor General's Office sent a request to Germany: "What experiments did Timofeev-Resovsky do all these 20 years, and especially during 12 years under the Nazis?" M. Roseman worked in the archive with the reports of the Kaiser

Wilhelm Society, checked all the publications - Timofeev-Resovsky did not conduct any experiments to test the racial theory of the Nazis.

Specialists from Russia and Germany, fascinated by the fate of Timofev-Resovsky.

"He was cramped in the audience..."

I.E. Vorobtsova (Russian Scientific Center for Radiology and Surgical Technologies of the Ministry of Health of the Russian Federation): We switched to research in the field of oncological genetics for the early diagnosis of various tumors, in particular, bladder and prostate cancer. And before that, 25 years were devoted to radiobiological research. They began a very long time ago and at a time when absolutely no one believed that the offspring of irradiated animals, which have only half of the genome as irradiated, could have any disorders. It always boiled down to the fact that these are congenital malformations of development, early intrauterine death, in humans - stillbirth. It was believed that everything that was phenotypically born normal is normal and in general. For the first time, we began to engage in the fact that, with the help of various loads on this offspring, we forced its

physiological status to manifest itself - whether it is good or bad. Of course, these were the methods of the past and the century before last: we forced these mice to starve, run, swim, irradiate them, and so on. Therefore, it was quite difficult at that time - just the beginning of the heyday of molecular genetics.

It all started with the fact that Russell showed that there is a linear dependence on the dose of the release of recessive mutations. After graduating from the Department of Genetics of the Leningrad State University and coming to graduate school at the Central Research X-Ray Radiological Institute of the USSR Ministry of Health, I began working in the laboratory of distant radiation pathology. There at that time obtained a linear dose dependence of the yields of leukemia in mice. They tell me: "You see, it means that leukemias are caused by point mutations. - This cannot be, because point mutations do not appear in the heterozygous state," I said, trained at the Department of Genetics. "Let's check it out!" It was with a desire to refute this assertion that I began. And when I reported at the department my first data on Drosophila: the offspring of irradiated males are inferior - they have a lower life expectancy, they tolerate stress worse, and so on - Mikhail Efimovich Lobashov, who headed the department, criticized me very much. But fortunately, Nikolai Vladimirovich was at this report. He said: "Misha! Not everything that seems to us is BSK (nonsense is an abbreviation of Timofeev-Resovsky). Let the girl work!" It made an impression on me and somehow inspired me, because, in general, no one believed in it, and it was difficult to publish. But data on Drosophila, mice, and rats gradually accumulated, and I have already devoted my doctoral thesis to the physiological inferiority of the offspring of irradiated animals. Vladimir Ivanovich Korogodin sent a very good response to the abstract, other geneticists also supported it, V.A. Shevchenko was my opponent.

And now, when all this is beginning to be repeated at a different methodological level, no one refers to what was done by us 40 years ago. No wonder they say that every idea goes through three stages: at first - this cannot be! Then, there is something in it. And, finally, how could it be otherwise? Now just the third stage. Nevertheless, when Chernobyl struck, this data was in great demand. They were obtained in the 1960s-1980s, and after Chernobyl it became clear that many people were irradiated, the effect could be massive. I myself worked in Chernobyl in 1987, however, we examined only the liquidators, later we began to examine the descendants of the irradiated liquidators.

In my report at the conference, I said that, firstly, the data obtained on animals were confirmed, and secondly, we have made great progress with biodosimetry: it turned out that in vitro calibration curves that are used to reconstruct doses underestimate them. Thirdly, we have a rather original approach to studying the bystander effect, because in the West they use microbeams - this is expensive equipment, with which you need to irradiate one cell, and watch the effect in neighboring ones. We proposed a simple model - this is the joint cultivation of male and female cells, and on the preparations it is clear where the chromosome aberrations are - in the irradiated cell or neighboring ones. Based on two criteria - adaptive response and level of chromosomal aberrations - it was possible to show that this effect really exists. But now we have almost stopped these studies, because there is not enough funding, everyone earns money, and we have started to diagnose cancer. There is also something to work on there, but even with self-supporting activities it is very difficult with reagents, equipment, so that you can do fundamental things. But young people now want to do this more than cytogenetics, cell genetics. My conviction is that at the current stage we have made a lot of progress in terms of methodology, but not very much in terms of concepts, because, in principle, we need to move on to understanding what all these molecular changes in cells mean for the biology of a cell, tissue, organism in in the end.

Do you remember any other moments of communication with Nikolai Vladimirovich?

It was the 1950s when genetics was coming out of the underground. Mikhail Efimovich Lobashov invited all the luminaries to lecture with us, we listened to Timofeev-Resovsky, Prokofiev-Belgovskaya, Rapoport, even Möller, who at that time came to Moscow. Timofeev made an

extraordinary impression: a man of the planet, he was cramped in our small classrooms, he walked from wall to wall, deducing formulas as he went. It felt the deepest knowledge, as they say, about everything. Of course, we sat with our mouths open. We also listened to Prokofiev-Belgovskaya, an absolutely charming woman, beautiful until the very last days of her life. In this regard, Lobashov was a great fellow, because he introduced students to all these wonderful people who would later be impossible to see or hear. Many of the previous generation went to Timofeev in the Urals in Miassovo.

Carmel Motherseal (McMaster University, Hamilton, Canada): Different people are exposed to low doses of radiation, but the biological response is different for everyone. Previously, they were primarily concerned with the effects of large doses associated with atomic explosions, and then these data were extrapolated to small doses. What are we doing? We show that the mechanisms that work in the human body when exposed to large doses do not work at low doses. And what signals are sent by cells irradiated with low doses, for example, fish to their non-irradiated counterparts, is very important. And we are studying these mechanisms that signal what is happening to the cell. If we understand how they work, then we can somehow interfere with the biological response mechanism, and this is important for protection against radiation, in order to make an assessment of radiation risks. And if we understand the mechanisms of the biological response, then we can use this knowledge for radiation therapy of oncological diseases - to build treatment much more efficiently.

Do people in Canada know about the works of Timofeev-Resovsky?

Yes, he is very famous, because his "Green Notebook" became practically the first book on radiobiology. She linked the mutation to radiation and to carcinogenic consequences. Experts know him very well.

Yu.E. Dubrova (University of Leicester, UK): Radiation, like chemical mutagens, causes mutations. Both factors cause DNA damage. An irradiated or mutagen-prone cell first of all stops dividing - under no circumstances should it allow damage-bearing DNA to get into replication, because then a cascade of errors will begin. We know at what level, but we do not quite understand how the cell makes the following decision: I have enough resources to repair (repair) all the damage, and it goes along the path of repair, or it decides that there are not enough resources for repair, and then she commits the noble act of suicide. The vast majority of DNA damages are repaired, and only a small percentage of damages are poorly repaired or not repaired at all. Further, the cell needs at least one cell division for the damage to turn into mutations. Mutations are misrepaired or unrepaired lesions that have gone into replication. This is the basis of mutagenesis.

The problem is this. We more or less decently imagine what happens in somatic cells. If there is a group of people who have received a dose, I take their blood and look at the amount of damage in the lymphocytes. Since cancer is a mutation accumulation disease, people who receive a non-lethal dose are more likely to develop radiation-induced oncology. There are many examples of this - the beginning was laid by research in Hiroshima and Nagasaki. But there is another side of the coin - sex cells. We have no reason to believe that they are any special. If mutations occur there and are passed on to descendants, then anything can happen. And here a very tricky paradox arises. In the late 1920s,

Möller in the United States first discovered that exposure to X-rays leads to a significant increase in the frequency of mutations in descendants, for which he received the Nobel Prize. In the late 1950s, methods emerged to assess this in mice.

And with a person, an interesting thing happens. The Americans were the first to look at how much hereditary pathology is observed in the descendants of people who survived the bombings of Hiroshima and Nagasaki. Similar work was later carried out among the children of patients who received radiotherapy in childhood. Both those and other studies showed the absence of any significant changes in the frequency of occurrence of hereditary pathology among the offspring of irradiated parents. On the one hand, it can be said that radiation has no effect on the occurrence of mutations in germ cells. But the fact is that if we look at the entire volume of hereditary pathology in humans (stillbirth and severe malformations), then the contribution of new mutations is only 5 percent, and the remaining 95 percent is the impact of the environment and old mutations. The problem is that, starting from the frequency of occurrence of pathologies, we cannot estimate the frequency of mutations in germ cells. We need to look for new methods. Over the past twenty years, repeated attempts have been made to invent something new. Now there is a completely unique situation: we live in the post-genomic era, which has come after the decoding of the human genome. The work on deciphering the genome gave not only a colossal amount of information, but also a powerful impetus to the development of technology. And now we have several methods in our hands, using which we can evaluate everything that happens in the entire genome. First of all, this is parallel sequencing, or sequencing of the entire genome in one pass. This is what we tried to do for the first time on mouse germ cells and showed that a substantial dose of paternal irradiation leads to an almost eightfold increase in the yield of mutations found in offspring. Moreover, very large DNA rearrangements predominate among them, that is, we are talking about millions of base pairs.

If this is extrapolated to a person, then an interesting thing arises. Among children with severe malformations and hereditary mental retardation, you will find a lot of carriers of such large genetic damage. According to our preliminary data, if you want to evaluate the clinical consequences of exposure to radiation, then look at how many offspring of exposed parents have mentally retarded children. Nobody did it. And to sum up, for the first time we tried to use methods for assessing mutation induction at the level of the entire genome. According to our data, the methods work. The simple conclusion is that we can now take DNA samples from non-irradiated and irradiated parents, if available, compare and get results that will eventually show whether mutation induction occurs in the germ cells of irradiated parents. And if it does, how many of them occur - two mutations per Gray or fifty? This is the next question.

Hanford - Ozersk - Chernobyl – Fukushima

Yuchi Ondo (Research Center for Isotope Dynamics and the Environment, Fukushima, Japan): Assessing the level of reports of young scientists, we can say that these scientific areas have good prospects. These are quite active young people who speak good English. This conference is attended by a large group of scientists from Japan, but most of them are not involved in radioecology. This does not mean that this topic is not important in Japan, on the contrary, these studies are very relevant. In connection with Fukushima, it is very important, and, most likely, it will become the main one in the future, it will remain at the peak of interest.

V.N. Golosov (MGU): I want to explain. Radioecology has two sides: the study of the very mechanism of particle transport, which is what Yuchi and I are doing, and how this transport affects biological components. Initially, we were not even radioecologists, but fluvial geomorphologists (my interlocutors study water flows and sediments in the river system - O.T.). Before Fukushima, in his case, and Chernobyl, in mine, we used radionuclides as tracers to assess the processes under study. We did not consider ourselves radioecologists, but after certain events we became involved in this activity for the simple reason that the main lateral transfer of those radionuclides is associated with water and sediments carried by this water. Our knowledge of the movement of these particles turned out to be very important for understanding all processes. Today, in the discussion, the question arose, what is carried into the Black Sea, as a result of which there are changes in the biota? In principle, this is a matter of lateral migration, but in fact - fluvial geomorphology. The amazing thing is that before Fukushima Yuchi was not engaged in radioecology, and after that he headed the entire monitoring of Fukushima.

Is it possible in this case to find out the latest data on the situation around Fukushima?

Yuchi Ondo: The situation is such that some local events, for example, the last release of radioactive water, do not affect the overall situation, we are talking only about the area adjacent to the station, which is polluted for a long time, and nothing can be done about it. As for the situation as a whole, since this is a mountainous area, unlike Chernobyl, the processes there are faster. Organized monitoring, on the one hand, gave an idea of how quickly sediments move and other processes occur, but it also remains the main topic, because it is necessary to understand what changes will happen in the future. In general, the situation is similar to Chernobyl, but monitoring must be continued in order to have a complete picture, especially in Japan the situation is more unstable both in terms of precipitation and other factors, and some extreme events can seriously affect the entire system. The typhoon in 2011, after the accident, was very powerful, with a lot of precipitation, but could potentially be even stronger.

V.N. Golosov: I will add on my own, and I regularly work at the same institute in Fukushima on issues related to the movement of radionuclides from the zone, and it is already clear that most fish, with the exception of the station zone, do not receive such a dose that would prevent their use. So far, the situation is generally positive.

The report "Plutopia: the great Soviet and American plutonium catastrophes" was made by **Keith Brown** (University of Maryland, Baltimore, USA):

I investigated the radiation releases at Hanford and at the Mayak plant in Ozersk. Why don't people know about Hanford in the US, while in Russia they don't know much about Mayak? Of course, these were closed military facilities. When I became interested in this story, I found out that the radioactive contamination in these places was made specifically to test their impact on the environment. At Hanford in 1959, up to 9,000 Ci of radioactive waste were dumped into the Columbia River daily. What for? To quickly and cheaply create nuclear weapons. But the people who worked and lived there, and their children grew up there, remained in complete ignorance of the danger they were exposed to.

Why did I call the report "Plutopia"? Good places were created, almost a utopian paradise: separate houses were built in Hanford for each family, free education was provided, medical care was provided, and all this in the far from rich west of the United States. They lived in a closed territorial formation, which Beria later reproduced in the USSR, lived very well, considered themselves chosen people. And in Ozersk, houses and dachas were also built for employees, Stalin told Kurchatov in 1949

that these people should be provided with everything. Ozersk had its own theater, orchestra, even a yacht club. Both there and there lived only parents with children without grandparents and other relatives. This means that they had to be provided with nurseries, kindergartens, and various household services. I read in archival documents in both places that some of the funds allocated for the creation of special containers for contaminated waste were transferred to the needs of the city. How many years have passed since these disasters, and there is still very little information, and it seems to me that they try not to think about these dangers or forget about them. Even after Fukushima - and this is very bad.

Did you work directly in the Ozersk archives?

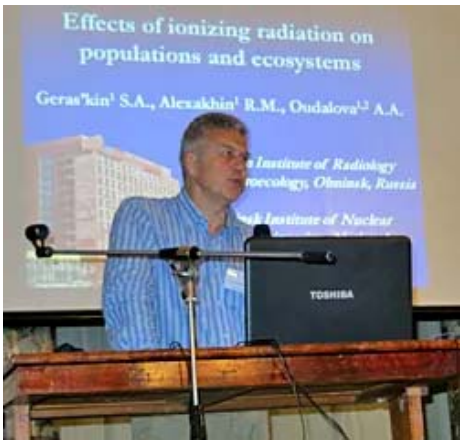
In the Chelyabinsk archive, they don't let me into Ozersk. There are good archives in Chelyabinsk - the regional, city archive of Ozersk and the Ozersk city committee of the CPSU. And from the materials it is clear that these topics have been repeatedly discussed. And the production archives are in Ozersk, I have not seen them. There are two historians, they are both from Ozersk - Tolstikov and Novoselov, they published their books in the mid-1990s. From them, I learned a lot about the documents they found in the archives.

How did you even get involved in this topic?

I am a historian, I studied the Soviet period. My first book is about Ukraine in the 1930s and 1940s, and it mentions the territories where the Chernobyl nuclear power plant was later built. And when, some time after the accident, tourism began in the exclusion zone, I arrived there. I wanted to look at the same villages, but after the disaster. I wrote an article about the trip, and the editor told me: you can write a book about Chernobyl, but there is such a plant "Mayak", which had more pollution than Chernobyl. And if I wrote only about Mayak, then English-speaking readers would think: oh, those Russians: first Mayak, then Chernobyl, something always happens to them, but everything is fine with us. But I already knew about Hanford.

Will you continue this research?

Now I have an idea to write a study about the Pripyat swamps. These are the largest swamps in Europe now. During the First World War, tanks could not pass there, during the Second World War, a lot of people died. There is a lot of water, few people - and it was necessary to build a nuclear reactor there? And there was a project to create 10 reactors there, a reactor park! I want to drive around the swamps and understand how people were able to endure everything and survive there, how they learned the art of survival on our planet, which is already almost destroyed ecologically. I try to write stories that give hope and not just upset people.



S.A. Geraskin (Institute of Radiology and Agriculture, Obninsk): The St. Petersburg conference brought together very interesting lecturers, a very wide geography. It must be said that it was especially difficult for the organizers to draw up a program for the section of radioecology, because a lot of extremely interesting abstracts were submitted. If we look at the final program, the representation is very wide: President of the International Union of Radioecology Francois Brecignac, representatives of the USA K.Brown and T.Mosse, Japan - T.Imanaka, Italy - Arigo Signa, Armenia - Ruben Harutyunyan. Russia is also represented quite widely. Here and Moscow - academician A.V. Yablokov, Tomsk - L.P. Rikhvanov, Yura Kutlakhmedov from Ukraine arrived - now this is a rare case, unfortunately. The Ukrainian Dima Gudkov, a good radioecologist, was supposed to participate and lead one of the sections, but, unfortunately, he could not come. Tatyana Maistrenko from Komi made a very interesting report, Zhenya Pryakhin from Chelyabinsk, Lena Antonova from Yekaterinburg. S. B. Gulin (Institute of the South Seas) from Sevastopol represented a

scientific school with great traditions, which was once headed by Academician Polikarpov. The color of world and Russian radioecology was assembled, so the idea of the organizers was a success. All the high-level reports, which were not always personal, aroused wide discussions. And it's very good when different opinions collide, so the truth, in general, is mined.

I think this conference was a success. This is not the first conference in the series, and here we must say a big thank you to Victoria Korogodina. I know how much time, nerves and effort she spends on organizing such conferences, and I bow to her for that. Thanks to her efforts, we have the opportunity to get together and discuss our pressing problems. I must say that this is one of the few conferences that gathers a very strong composition of participants, it is pleasant to discuss different things with professionals here. I have a lot of experience, I often travel to conferences and, from my point of view, the composition that was assembled here is stronger than in Kyoto at the World Congress of Radiation Research.

Microevolution on the go

I asked the academician to remember Timofeev-Resovsky **I.A.Tikhonovich** (All-Russian Research Institute of Agricultural Microbiology, St. Petersburg, *pictured on the right*):

Who was he and who was I? I am a student and he is a lump. It was very interesting to talk with him, because he had his own point of view on everything. For example, if you sit with him at a banquet, he could talk about the merits of the cuisines of Moscow and St. Petersburg, that pies in Moscow were always better ... He was, on the one hand, a very friendly person, and on the other, very tough. When he started a discussion, and if something did not suit him, he did not really spare his opponent, he did not look for academic expressions. There were discussions at our Department of Genetics, at that time they tried to find, catch, explain microevolution, including those who deal with

varieties. The variety must be leveled, any microevolutionary processes in it only interfere. And many of our researchers wanted to show that these processes are also going on among the cross-countrymen. What is true: they really go there, and the variety needs to be stabilized. And Timofeev-Resovsky did not exactly deny this, he always demanded clarity in definitions. He always got angry when some incomprehensible definitions were given, and said: "You can't define a table in this way - a table is such a chair and so on."

He had wonderful lectures, he spoke very simply about very complex things - the person listened to him and lit up, understood what to do. And then, the romantic veil that surrounded this person - he worked in Germany, talked with luminaries, created people himself ... One of those who is related to the discovery of the structure of DNA. While working in Berlin-Buch, he kept his Soviet passport, saved the necessary specialists from the concentration camp. His son, who participated in the Resistance, died in the dungeons of the Gestapo. He returned here - he ended up in places not so remote, thank God, Zavenyagin saved him ... So there was a veil of romance on him. It would be necessary to devote a separate lecture to him here ...

...A memorial round table will be held on the last day.

Well, probably, this somehow compensates for everything, because we know about him, but young people need to be told. This is a good example, all the more so now, when we are rushing from one extreme to another - either we need to invite everyone from the West here and organize life here in a new way, or we block all the bridges.

And how, in your opinion, are the main directions proposed by Timofeev-Resovsky developing now?

For example, what is microevolution? It seemed like a very simple thing. Timofeev-Resovsky counted ladybugs. In the fall, for example, there were 90 reds, 10 blacks, in the spring - 50 to 50. This change occurred due to the fact that someone selectively died. Interesting? Yeah interesting. But these were some academic questions and, as it were, the aftereffect of evolution. Yes... But now it is clear, especially on microbial populations, on the interaction of microbes and plants: in order to get into a plant, microbes need to go through some stages of the microevolutionary process, they must change their genotype. And the fact that plants are able to interact with microbes feeds us - they save nitrogen, save chemistry, and allow organizing what is now called organic farming. It turns out that microevolutionary processes underlie this interaction. What is our stomach? This is a field for microbes. As soon as we took the antibiotic, we laid down all the microflora. Then it randomly arises, but under the influence of our genes it stabilizes and becomes the same. This is microevolution, as they say, on the go. Therefore, from purely contemplative - think about counting ladybugs - we moved on to things that determine our ability to survive, eat, and so on.

Participated in the conference and a biology teacher of school No. 30 **E.A.Mikhailova** (Chelyabinsk): Timofeev-Resovsky's laboratory "B" was recently declassified. Now we, ordinary people, can go there and see. The laboratory has been preserved, the park has been preserved, and I have an idea, if I have enough strength, to restore this park in the form it was under Nikolai Vladimirovich, with flower beds and greenhouses. His dacha is also well preserved, and we had an idea to organize a Timofeev-Resovsky museum there, but for now the site remains closed. When I called Snezhinsk and said that we were already taking tourists, they answered me: in fact, no one gave you permission. However, some restrictions have been lifted, and we can show the dachas of foreign specialists who worked with Timofeev-Resovsky. I would like to master Bolshoye Miassovo as well, a house and a laboratory have been preserved there, but it is part of the Ilmensky Reserve - this is also a problem.

R.M. Harutyunyan (Yerevan State University, Armenia): These conferences continue the work begun in the 1980s - in 1983, two years after the death of Timofeev-Resovsky, the first conference in his memory was held in Armenia. Then commemorative readings were held in Armenia, and ten years ago - the next conference dedicated to Timofeev-Resovsky. And now, together with him, we honor both Vladimir Ivanovich Korogodin and Vladimir Andreevich Shevchenko. I myself studied with academician Bochkov, and he, a student of Timofeev-Resovsky, worked with him in Obninsk. That is why participation in this conference is so dear to me. We in Armenia are developing ecological, toxicological, radiation genetics, and therefore here I received a huge positive charge and new contacts.

I was often invited to Dubna to conduct seminars at JINR on the problems of mutagenesis and antimutagenesis. We were very good friends with JINR Director Academician Alexei Sissakian. One of the classrooms of YSU Faculty of Biology is named after his father, the famous biochemist and organizer of science Norayr Sisakyan. Academician Yuri Oganesyan, one of the greatest scientists of our time, works in Dubna. He led the discovery of new elements of the periodic table. The last time we were in Dubna was with Anna Boyadzhyan, director of the Institute of Molecular Biology, at the conference "Actual Problems of General and Space Radiobiology and Astrobiology", in memory of N.M. Sisakyan and A.N. Sisakyan. At this conference, the pioneering work of the JINR LRB on modeling the cosmic origin of life was presented. Radiobiologists used the unique capabilities of the Dubna accelerators to produce heavy ions, which bombarded the reaction mixture. This is a brilliant example of the use of nuclear research in biology.

Final slide of the report **M.S. Gelfand** (Institute for Information Transmission Problems of the Russian Academy of Sciences) contained a list of good deeds of the Dynasty Foundation by D.B. Chairman of the meeting academician **S.G. Inge-Vechtomov** remarked: “The Dynasty Foundation is a good and useful thing in relation to us. I propose to send a telegram of support to D.B. Zimin with the following content: “Dear Dmitry Borisovich! We thank you for financially supporting the participation of Professor M. Lynch (USA), who was invited to give lectures on evolutionary genetics in Moscow and St. Petersburg and participate in our conference.” The participants of the conference supported this proposal.

"... With soul and without animal seriousness"

The final day of the conference began with the awards ceremony. The N.V. Timofeev-Resovsky medal "Biosphere and Humanity" was awarded to the participant of the conference, President of the International Union of Radioecology Francois Brechignac (France), who, in particular, said: "I am very proud of this award. Russia has a long tradition of scientific research. The basic principles of ecology were laid by V.I. Vernadsky, genetics and radiobiology - by N.V. Timofeev-Resovsky. Professor H. Abel (Germany) was awarded the same medal for his contribution to the study of the biography of Timofeev-Resovsky and the promotion of his achievements. Then the winners of the competition for young scientists in memory of V.I. Korogodin and V.A. Shevchenko were awarded. A.A. Nizhnikov (St. Petersburg), A.G. Lada (St. Petersburg - USA), I.V. Kulakovskiy (Moscow), K.P. Afanasyeva received the medal "The Phenomenon of Life" named after V.I. Korogodin (Dubna). A.V. Korsakov (Bryansk) and M.V. Modorova (Ekaterinburg) were awarded the V.A. Shevchenko Medal "For Achievements in Radiation Genetics". Diplomas of the Vavilov Society of Geneticists and Breeders, the Russian Academy of Sciences and the N.V. Timofeev-Resovsky Society were also presented.

The conference ended with a round table "NV Timofeev-Resovsky: science without borders". Opened by Academician **A.V. Yablokov**: "It happens with all great scientists - the more time passes, the clearer, brighter we see what they brought into our lives. Timofeev-Resovsky attracted an incredible number of people. I don't know another person in Russian science who involved so many This phenomenon is explained quite simply: unlike most scientists, Timofeev-Resovsky was open to everyone. Yes, he could irritate, instruct cones, but at the same time handing out fruitful ideas right and left.

A few words about his great achievements in those areas that are close to me. In the field of general genetics, he introduced the concepts of expressivity and penetrance, the principle of hitting and the theory of the target, in evolutionary doctrine - the doctrine of microevolution, in the general theory of biology, I would single out four main levels of functioning and organization of living things. A month before his death, we talked in a hospital in Obninsk. Suddenly he said: "Probably the most important thing that I have done in science is the principle of the amplifier." And in fact, what he formulated in relation to mutations, when an insignificant mutation leads to big consequences, he applied not only to genetics. He was a wonderful methodologist, his approaches to scientific research are applicable everywhere. First: to distinguish the essential from the non-essential. In endless conversations, this sounded different, for example, one should not study the fortieth leg of a centipede. Second: the world is not jelly (in the sense - discrete). Hence the need to establish a hierarchy of events, factors, which makes it possible to determine elementary phenomena. I don't find

scientific equivalents for the third, but Nikolai Vladimirovich repeated it thousands of times: you should never do what the Germans will do better than you.

G. Erzgreber (Germany) recalled meetings with Timofeev-Resovsky in Obninsk in the 1960s: "It was interesting to talk with him about everything - about science, art, philosophy. His laboratory was a special place in Russia." G. Erzgreber also worked at JINR - together with Timofeev's student V. I. Korogodin in the sector of radiobiological research.

The "unscientific" part of the life of Nikolai Vladimirovich was presented by an art critic **M.A. Reformatskaya** (MGU). "He made an explosive impression. He very strongly expressed the type of person who began to form since Peter the Great: inquisitiveness, perseverance, recklessness, the habit of speaking in the Peter's manner, using words from the Peter's lexicon, could sometimes sharply scold opponents. He appreciated not only ancestral genealogy, but also scientific... He knew how to communicate with people of completely different levels - with Niels Bohr, work colleagues, schoolchildren and even guards...

Koltsov took care of him very much and was very worried about him, knowing the explosive nature of Nikolai Vladimirovich, therefore, probably, he organized this business trip to Germany ...

Timofeev-Resovsky liked how A.I. Solzhenitsyn portrayed him in the novel "The Gulag Archipelago", including in the chapter dedicated to him, which describes a circle of scientists in cell No. 75 of the Butyrka prison...

He experienced great difficulties with his scientific work and with his dissertation, which he could not defend the first time. As he jokingly said: "If there hadn't been a small October coup - the removal of Khrushchev, who weakened Lysenko's position, this dissertation would still be gathering dust in the VAK."

About the life and death of the eldest son Timofeev-Resovskikh Dmitry and meetings with the youngest - Andrey told **R. Winkler** (Germany). Another participant of the round table, scientific secretary of the society "Biosphere and Humanity" **N.G. Gorbushina** (Medical Radiological Research Center, Obninsk) introduced A.V. Yablokov: "We are all very grateful to him, his role in the last years of Nikolai Vladimirovich's life is very important. And it is thanks to Nikolai Grigorievich that the N.V. Timofeev-Resovsky Society is maintained." He presented a project of a monument to the scientist, which is planned to be created in Obninsk. I remembered how Timofeeva, after another life collision, invited O.G. Gazenko to work at the Institute of Biomedical Problems, to which Nikolai Vladimirovich replied: "You won't fly into space from a good life!" And Timofeev-Resovsky liked to repeat: "Science must be done with soul and without bestial seriousness."

Concluding the round table and the conference, A.V. Yablokov expressed his deep gratitude to Victoria Lvovna Korogodina and everyone who helped her for the titanic work in organizing the conference. "I would like to devote the next conference to the development of ideas thrown by Timofeev-Resovsky in passing or discussed seriously."

Instead of a postscript

Every morning we went up to the conference hall along the wide stairs under the stern gaze of Emperor Peter the Great, who met everyone from the mosaic picture of Lomonosov, beating the Swedes near Poltava, during breaks I talked with the participants of the conference, sitting on ancient sofas under portraits of the reigning persons and the first academicians, - it seemed , the spirit of history and the academic atmosphere have been reigning here for two centuries. After all, the St. Petersburg Scientific Center, which hospitably received this conference, is located in a building specially built for the St. Petersburg Academy in the 1820s by the architect G. Quarenghi, and the building has been preserved in its original form. Until 1936, it housed the Presidium of the USSR Academy of Sciences. In tsarist Russia, the presidents of the Academy of Sciences were appointed by the emperor. The last president was Grand Duke KK Romanov, who died in 1915. In 1918, the first presidential elections were held in the Academy of Sciences, and the geologist A.P. Karpinsky became the president. Under him, the administration of the academy began to move from Leningrad to Moscow. When everyone had already moved, only Karpinsky remained in Leningrad, pulling with the move. Stalin asked if the academician had any special wishes about where to live in Moscow? Karpinsky replied: he doesn't care where he lives, he just would like the windows of his apartment to overlook the Neva.

After 1991, the St. Petersburg Scientific Center was opened in this building, headed by Academician Zh.I. Alferov. The center united more than 40 St. Petersburg academic institutions. The story continues.

Olga TARANTINA, St. Petersburg - Dubna, photo by the author.
Translation by Svetlana Chubakova and Valentin Golosov.