

Mikhail Malyutov

September 3, 1990 (Interview 1: Moscow, Inn Akademicheskaya) and September 13-14, 1996 (Interview 2: Ithaca, New York)

Highlights

A. Family History (Interview 1, 0:00-7:15)

E. D. Let's start with your background and your family. Interviewing my students I learned a lot of interesting things about their background. For example, it turns out that some of them are of noble descent. Others have their roots among clergy and peasants. What about your ancestors? As a rule, people in this country can't trace their family very far back.

M. M. Unfortunately, I am one of them. All of my mother's family perished at the hands of the Germans in Ukraine during WWII. They were Jewish. My father hails from a peasant family in Vladimir region from where they moved to Moscow. To be precise, it was my grandfather who first moved to Moscow. He worked as a taster in a tea factory, which partly explains why I like tea so much. [*Laughs*].

My dad was a self-made man. His father fought in WWI. He was wounded and passed away in 1918 when my dad was still very young. My grandmother was left alone to raise two sons and a daughter. She managed to put all of them through university in spite of being just a custodian. The family barely managed to make ends meet. They were also on bad terms with their relatives. There was no one to help them out.

To make a long story short, my dad was raised in an orphanage. To get secondary education he had to move to Vladimir. A local priest helped him by convincing a communist boss to give him a spot in the orphanage. The priest pointed out what a bright and talented kid my dad was. He sang in the church choir. The priest said that all of these talents would be wasted if the orphanage turned him down.

This orphanage was a secondary school which offered professional training. Having finished the school, he came back to Moscow with the intention to apply to a university. He was admitted into the Bauman Institute. I don't even know what it was called at that time.

E. D. The Highest Technical School.

M. M. Then he was drafted into the army, where thanks to Stalin's purges¹ he quickly managed to make a career. He was a military engineer specializing in building bridges. Most pontoon bridges of the Red Army were captured by the Germans at the beginning of the war, and my dad worked on constructing new ones.

In 1948 all of a sudden he changed his profession. He was hired to work on a nuclear project and served as the head engineer in nuclear weapons tests. He was a double-starred general and the Candidate of Technical Sciences.²

E. D. Double-starred? What does that mean?

M. M. Lieutenant-General. He was a strict man. My kids' lineage is far more interesting than mine because my wife's ancestors are related to some major figures in the history of Russia. My wife's grandmother was a close relative of the Ulyanovs.³ Her grandfather's last name is Kalashnikov. He was a manufacturer of ship engines. He also owned a number of museums in Gorky (Nizhny Novgorod) and Uglich. He married a daughter of a millionaire by the name Smirnov. The Smirnovs were relatives of the Ulyanovs. Kalashnikov's son became a revolutionary, very likely under the influence of Ulyanov-Lenin. People have written books about him. He perished in the purges of 1937.

E. D. Was your family affected by Stalin's purges?

M. M. No, on the contrary. I used to know quite well some of Beria's deputies.⁴ [*Both laugh*].

E. D. How was it possible?

M. M. My mother was a doctor. She worked in a hospital. There she met my dad when he was undergoing a treatment. Her close friend had an affair with a man by the

¹ These purges had the objective of cleansing the Red Army of the so called "politically unreliable elements".

² See [academic degrees page](#) on this site.

³ The family of Lenin.

⁴ http://en.wikipedia.org/wiki/Lavrentiy_Beria

name Vladimirsky who was Beria's supervisor in the investigations unit. He was a terrible person. He ended up being executed.

E. D. When was he executed?

M. M. In 1953. These people were our family friends. Perhaps this is the reason why my father remained alive. The nuclear project was closely supervised by Beria, as you know.

E. D. Of course.

M. M. Beria had a deputy in Kazakhstan who was personally supervised the tests, and my father used to have some serious disagreements with him. I can't say they didn't touch him because of his friendship with Vladimirsky. It wasn't really friendship. Bottom line is that they were afraid to do anything to him. In those difficult times cautious people survived.

E. D. Sometimes they did. Sometimes they didn't.

M. M. Alright, let me get back to my wife's family.

E. D. Your story is very fascinating, not only on a personal level but also because it gives an interesting historical perspective on Russia of those times.

M. M. Aunt Raya, the woman who was in a relationship with Vladimirsky, used to provide medical treatment to me. She worked in a clinic for upper echelons of the KGB.*[Laughs]*. Moreover, I went to school with a daughter of a very important KGB officer and almost ended up marrying her. So KGB got along pretty well. Perhaps I should be even grateful to them in some way.*[Laughs]*.

On her father's side my wife's relatives are even more impressive. Among them you find two generations of imperial generals. One of their descendants was a very prominent pianist Boris Leonidovich Zhilinsky, one of the favorite students of Balakirev.⁵ Zhilinsky's wife was a daughter of Fedor Bogorodsky.⁶ Clearly, that side of the family was artistic elite.

⁵ http://en.wikipedia.org/wiki/Mily_Balakirev

⁶ <http://welcomeart.net/bogorodsky-fedor>

B. Early Life and First Steps in Mathematics

(Interview 1, 7:15-11:46)

E. D. How did you get interested in mathematics?

M. M. This is also a very interesting story. As a son of a general, I was expected to ...

E. D. I never knew that you were a son of a general. Not that it mattered.

M. M. Well, I kept it a secret.

E. D. No, you didn't, but you didn't advertise it either.

M. M. At least I can say that I never used it to my advantage.

E. D. Yes, of course. But I knew that some other students had influential parents.

M. M. This wasn't relevant in my case. My dad never interfered in my life or upbringing. He only made sure that I did my chores and brought home good grades.

E. D. And you call him a tough man?

M. M. However, he was uncompromising when he needed my help in building a summer house or doing renovations.

E. D. You were a pretty good student.

M. M. He was quite happy with my academic performance and didn't care about the details. So I cannot say that parents played a big role in my upbringing.

The person who did was my teacher of music, and she did it without asking for anything in return. My parents thought that I was a talented kid because in the age of six I took part in an audition at the Moscow Conservatory. According to my mother, I was the only kid who passed it. As a result I was assigned a tutor, completely free of charge.

E. D. A tutor in singing?

M. M. No, in piano. I was too young for singing. My tutor was a Pole, who eventually returned to his country. When he left I was tutored by other people, but they didn't do a very good job. At one point I simply stopped practicing. But one day my parents invited Angelina Sergeevna Shapran, the wife of the head of the Department of Music at the Pedagogical Institute, who was brought up in the family of Abram Mironovich Lopshits⁷.

⁷A prominent mathematician who worked as a professor in the chair of Geometry at the Yaroslavl Pedagogical University. Renowned for his erudition, Lopshits was an expert in art, music, and literature.

Angelina Sergeyevna grew very much attached to me. I was in grade six or seven I believe. I remember that within a month after she was hired I had a fight with my mother. She was so mad with me that she let go all of my tutors: a tutor in French, in music, and all others. So she basically fired Sharpan without giving any explanations. However, Angelina Sergeyevna decided to continue working with me even though she didn't get paid.

She introduced me to Abram Mironovich. I had absolutely no intention to become a mathematician. When I was in grade nine, my interests for the most part revolved around music, engineering – due to the influence of my dad, although I didn't know anything about his work – and even a military academy. In grade nine I was invited to the house Lopshits. His family lived in an old, wooden building in the Arbat.⁸ The house was later demolished. I was enchanted by the atmosphere of the house and fascinated by the intellect of Abram Mironovich. He began giving me math problems. At about the same time I also started attending a math circle run by Mitya Fuchs⁹ and Galya Tyurina¹⁰. Attending the sessions of the circle I realized that I liked mathematics. In grade ten for the first time I took part in the Moscow math Olympiad. Although I wasn't among the winners, I did pretty well and received an honorable mention. To this day I remember the feeling that I had when I was trying to solve these problems. I must say that they demanded a lot of focus and concentration, and I had very little experience. I was new-comer in the circle. I also remember the feeling of satisfaction when I went from struggling with math problems to competing at a very high level.

(Interview 2, 71:19-79:12)

M. M. What do children need? They need to know that somebody cares about them and tries to expose them to various aspects of human culture. This is exactly what I received from Angelina Sergeyevna.

⁸ Historic center of Moscow.

⁹ <http://www.math.ucdavis.edu/research/profiles/fuchs>

¹⁰Galina Tyurina was a specialist in algebraic geometry and wife of Dmitry Fuchs. She died on a kayak trip in the summer of 1970. See obituary by Vladimir I. Arnold, *Russian Mathematical Surveys* (1971), 26(1):193.

Angelina Sergeyevna often brought me to the Lopshits house. It was a very interesting place. People listened to music and discussed all kinds of things. Her tutoring was not limited to one-on-one teaching. She took me to concerts and educated me about the cultural life of the city.

E. D. Were you the only student?

M. M. No, she had a lot of students. Most of them were girls. I think I was the only boy.

E. D. Did she spend time with you apart from the rest?

M. M. Absolutely. I met her other students, but she always gave me her undivided attention. I consider her my second mother. My parents were always busy. My father worked in Kazakhstan, and even when he was back in Moscow he used to come home from work very late. Don't get me wrong, I am not complaining. God knows my dad loved us. He had a car, and every once in a while he took us out on Sundays to pick mushrooms. Other times we would take a train and go skiing. I give him credit for forcing me to stay in shape. These outings, however, were rare and sporadic. No one supervised me on a daily basis. I was an A student at school, and this was all my parents cared about.

My mother was an activist of some sort. She had the degree of Candidate of Sciences from the Mechnikov Scientific Research Institute of Vaccines and Serums. She participated in development of a number of vaccines. No doubt, she was a very interesting person in her own way. She is still alive, though of course retired, and she is very active in war veteran organizations.

The husband of Angelina Sergeyevna was a member of the Composers' Union. He wrote a number of symphonies and concerts. He even played them to me when I visited their house. Can you imagine how flattered I was when a real composer played his works just for me? It seemed that a whole a new world opened up before me. This was exactly what I needed. I could have easily chosen a different path. I could have pursued a military career, and my father's connections would have helped me, He never helped me personally though. It was against his principles.

At first I had only general conversations with Lopshits. But after a while he started giving math problems to me. I remember that the first cycle of problems that he gave me had to do with the solution of a system of linear equations. We didn't the subject in school,

but I did a good job, and Lopshits moved on to other problems. Pretty soon he realized that I was pretty good in logic and a fast thinker too. He told me that in his opinion, since I didn't have any other passions, I should become a mathematician. To make further steps in this direction, he encouraged me to join a math circle. Aside from math, he gave books in English and took me to concerts.

E. D. Did he work with you individually?

M. M. There were a lot of kids who were under his tutelage, but every single one of them met with him individually. And to be honest he didn't spend too much time with me – certainly not as much as Angelina Sergeyevna. He was only interested in me to the extent that I was a member of his intellectual salon. These gatherings featured musical improvisations and intellectual conversations on various topics.

E. D. You were still a little boy at that time, weren't you? I assume that most other participants were adults.

M. M. A lot of people were coming to his house, and Lopshits was able to find time for everyone. He never considered it his goal to make a mathematician out of me. We were just friends. After my admission to the MSU I visited him a few times but our relationship started to wane. After all, there was nothing else he could give me in terms of mathematics. Moreover, he held a professorship in Yaroslavl and was often away from Moscow.

He was an important figure in my education mainly because he sparked my interest in math, but he never really was my mentor.

C. Admission to Mekhmat (Interview 1, 11:47:15:54)

M. M. Another interesting thing is that I failed my entrance exams but was nevertheless admitted.

E. D. How did this happen?

M. M. The head of the admissions committee was Konstantin Alxeevich Rybnikov¹¹. To begin with, this was the year when students graduating from high school with medals

¹¹http://ru.wikipedia.org/wiki/Рыбников,_Константин_Алексеевич

were no longer admitted automatically. Like everyone else, they had to take entrance exams. The admissions committee broke the news two weeks just before the exams.

Since I graduated with a medal, I considered myself a genius. I was somewhat weaker in physics and therefore tried to prepare. As for math, I didn't study at all. So I took the entrance exams completely unprepared. To make things worse, there was one problem on the exam that simply had no solution. I was not the only one who stumbled on it. As usual, I didn't allocate my time correctly. Because I couldn't get it right, I spent most of my time on this problem. I thought that the rest of the problems were trivial, but I managed to make some errors even there. Thus, in one of them I wrote arc sine instead of arc cosine.

I ended up getting an F. This was one of the most humiliating episodes of my entire life. I have never experienced anything similar since then. I was emotionally crushed. But then I approached Konstanin Alexeyevich to appeal my grade. Perhaps he felt that it was partly his fault, and when I showed him my honorable mention...

E. D. But let me tell you what I think. The fact that he helped you probably had nothing to do with his feeling of guilt. He must have known that your father was a decorated general involved in nuclear projects and having connections in the KGB. Maybe even somebody gave him a call.

M. M. I can't rule it out. I know that my father talked with people in the admissions committee but not with him personally.

E. D. It doesn't matter. All I want to say is that he was a man from the upper echelons of power.

M. M. You may be right. I don't know why but they raised my grade from F to C and allowed me to take the second exam. There I also got a C. There was no competition at all because many people failed the first exam.

There was a positive side of this incident. It taught me a lesson and forced me to reconsider my attitude. I started working much harder than before. As a general's son I used to be a little bit spoiled. By the way, in my high school there was an excellent math teacher Alexander Abramovich Shershevsky. But he taught in a parallel group, whereas my teacher didn't want to have anything to do with me because I knew math way better than he. He didn't even correct my homework and as a result completely spoiled me. I should have transferred to the group of Shershevsky.

D. Mekhmat 1958-63
(Interview 1, 17:48-19:47)

M. M. As a freshman I started attending various seminars. One of them was the seminar of Pavel Sergeevich Alexandrov.¹² Almost immediately I was assigned Shura Arkhangelskii¹³ as my supervisor. I remember that he gave me a problem which, I believe, I could solve. This was my chance to have a publication already in the freshman year. However, I wasn't too thrilled with this seminar. Around the same time I made friends with Leontovich and Vakhutinsky who went to the Gelfand seminar. Prior to this Leontovich had contacts with Arnold and, possibly, also with Gelfand because of his family¹⁴ and because of many years of his participation in mathematical Olympiads. I was instinctively attracted to them and went to many seminars (including your seminar) beginning from the freshmen year. I participated in the seminar of Arnold until my fifth year. There I didn't receive any results. My first success was achieved when I worked at your seminar on random walks on groups with a finite number of generators.

E. D. Our joint paper¹⁵ on this subject is very frequently cited. Of course you contributed very significantly but, unfortunately, sometimes only my name is mentioned in this context.

M. M. Due credit must be given to Leontovich, also a participant of your seminar. He considered a special case. This is acknowledged in the paper. I also used an estimate that he deduced. Work at your seminar had a great impact on my formation as a mathematician. Arnold's seminar was entirely different. I never considered myself his student, but he has always been a beacon for me. Subsequently, I had many interactions with him. Together we kept watch by the bedside of ailing Kolmogorov. His self-sacrifice stunned me.

¹² http://en.wikipedia.org/wiki/Pavel_Alexandrov

¹³ http://en.wikipedia.org/wiki/Alexander_Arhangelskii

¹⁴ A. M. Leontovich is the son of Mikhail Alexandrovich Leontovich (February 22, 1903 - March 30, 1981) - a Soviet physicist, member of USSR Academy of Sciences, specializing in plasma and radiophysics.

¹⁵ Soviet Mathematics, Doklady, March 1961, Vol. 2

(Interview 1, 21:57-22:30)

M. M. I remember vividly the freshmen analysis recitations¹⁶ taught by Boris Pavlovich Demidovich.¹⁷ The first thing he asked was what marks we received in our entrance math exam. When I heard that I grew pale. I already told you about this debacle. Right away he started calling on people who he thought needed an extra control. I solved scrupulously all problems and soon became his favourite student, the only one in the group allowed not to take the final exam.

(Dynkin - Interview 2, 7:23-9:50, 20:20-21:45)

M. M. In my second year I attended three remarkable seminars. They were very different. One of them was yours. It was extremely popular among younger students. I don't think there has ever been a seminar that could rival it. You used to tell us that every complex theorem can be broken down into pieces which can be proved by any able student. The thing is, you are the only person I know who was capable of dissecting a theorem in this way. First, it is hard to imagine that anyone would take it upon himself to do that because there is nothing to gain from this exercise in terms of research. It benefits only students. Second, it is hard to find a person who can do it even if they want to.

Another notable feature of your seminar was the breadth of topics which we studied. Among them were angles between subspaces, game theory, Markov processes, information theory, and many other things.

E. D. In other words, a few exiting topics that I understood well enough to communicate my excitement to other people.

M. M. What you consider "few" was more than enough for us. Also, the seminar was coordinated with your lectures.

E. D. What were these lectures on?

M. M. They were on algebra.

E. D. Well, this is a very standard subject.

¹⁶A regularly scheduled session of problem solving associated with a lecture course.

¹⁷ http://en.wikipedia.org/wiki/Boris_Demidovich

M. M. True, but in addition to the mandatory algebra course you started soon a course on manifolds and Lie groups and algebras.

E. D. You probably know that back then every three or four years I used to scout for talented students with whom I worked afterwards for a number of years. Your class was one of those I picked for these purposes. The previous one was the class of Mark Freidlin.¹⁸

(Arnold, Gelfand, Godunov, Kolmogorov – Interview 2, 9:50-17:10)

M. M. The second seminar was that of Arnold. Leontovich brought me there. I can name some of its participants: Sergey Novikov, Sinai ...

E. D. This was not a seminar for beginners.

M. M. Yes, you are right, but it was open to everyone. There were also Oseledets, Anosov ...

E. D. These are all big names.

M. M. The brightest star was obviously Arnold himself. Students admired and wanted to emulate him. His approach was very different from yours. You invested much time and effort in educating us. Arnold didn't care about that. He was interested only in science, but somehow we wanted to be like him.

M. M. A seminar for young people was started by Gelfand. He handpicked five or six participants but talked only to Leontovich and Vakhutinsky and ignored the rest. Also, he didn't take into account our level of knowledge. He would present a problem in vague terms difficult to understand for unprepared people.

He got fed up with it pretty soon, in about five months. I think that Ilya Vakhutinsky managed to write something related to tomography but I don't think this was published.

Later I participated in the seminar of Godunov. I met him on kayak trip when I finished my third year. It was Girsanov who invited me. On this trip I met a lot of wonderful people with whom I went on similar trips later on. I went with Dobrushin and Berezin. On the same trip I also met Vvedenskaya. I like Godunov a lot.

E. D. He is a very talented person.

¹⁸ Interview with him is a part of this collection.

M. M. In his seminar Godunov assigned his students to read papers. I was assigned a paper by Riemann on sound waves.¹⁹ He didn't give any specific instructions. I had to present and discuss it. I didn't understand what that meant, and so I didn't approach the project creatively. Godunov wasn't happy with me, and our collaboration ended at that point. He was an interesting person, but his seminar was boring.

There were also lectures. I took a lot of those, and I will try to classify my lecturers as well. To begin with, I attended all Kolmogorov's lectures I possibly could. I didn't understand any of his courses but the last one, and I will try to explain why. I also attended his talks and presentations outside the Mekhmat curriculum. I learned much less from them than I did from my one-on-one conversations with him. When I started working in his lab and had a chance to hear his opinion on various subjects, it was absolutely terrific. Prior to that I was a bit intimidated by him and never dared to approach him with a question. He no longer offered probability seminars and I had no chance to establish a personal relationship with him. Nevertheless, Andrey Nikolaevich taught a wonderful assortment of courses, and I tried hard not to miss any of them, even though I barely understood what he was talking about. His basic course on probability theory was quite unusual. I don't understand why he devoted two lectures to the decomposition of measures into absolutely continuous and singular parts. Why he wanted to explain that to freshmen?

E. D. It must have been a specialized course of some kind.

M. M. No, it was an obligatory first-year course. If I had known probability theory at that time, I would have greatly benefited from this class. Without knowing it, it was very difficult to keep track. The only course that was extremely useful for me was his class on random processes for engineers which I took in my fifth year. It was wonderful. I already knew everything because I had taken before your class. It was so typical of his teaching style to jump from one subject to another. The engineers barely understood anything. He had a selection of topics that were not related in any way. Among them was harmonic analysis of random processes beginning from examples. To follow him was difficult but, since I was already prepared, this was possible and very interesting.

¹⁹ <http://www.maths.tcd.ie/pub/HistMath/People/Riemann/Welle/>

(Landau – Interview 2, 22:30-23:43)

M. M. The most brilliant lecturer of all I attended was Lev Davidovich Landau.²⁰ His showmanship was unsurpassed. He would have been a great actor if he had pursued a theatrical career. Every single one of his lectures was a work of art. He always finished them ahead of time and based them on chapters from his books. I took his courses on mechanics, hydrodynamics, and the theory of elasticity. His lectures were so polished in every tiny detail that I was stunned and was unable to approach them critically. Nevertheless, whenever somebody asked questions (and it is well known that his works contain a lot of inaccuracies), Lev Davidovich took time to answer them after class and tried to clarify everything that was unclear. At the same time he also tried to sidestep particularly difficult problems. I think that this approach is pedagogically sound. I think that sometimes it is sufficient for a lecturer just to mention that a particular problem is difficult and set it aside. It is not always helpful when a lecturer tries to prove meticulously every step of the argument.

E. Boundary value problem with oblique derivative (Dissertation)

(Interview 1, 23:05-28:26)

E. D. Tell me about your work on the boundary value problem with oblique derivative.

M. M. It began in my fourth year from a conversation with Mark Freidlin about one of his articles.

E. D. What year was that?

M. M. It was around 1961. We were good friends already then. The subject was the classical boundary value problem with oblique derivative for the Laplace equation in a smooth plane domain. A vector field is given on the boundary and conditions on solutions involve their derivative in the direction of this field. Mark suggested that, if the field is tangent to the boundary at some points, then the behavior of solutions near this point can

²⁰ http://en.wikipedia.org/wiki/Lev_Landau

be investigated probabilistically by considering the behavior of the corresponding diffusion.

In my fourth year as a student I started working on this problem. At first I couldn't crack it. However I knew more or less how to approach it. Aside from that I studied all the relevant literature. Poincaré was the first to formulate the problem in his work on the theory of tides. Hilbert achieved a major breakthrough. His work became an instant classic. I read the works of Hilbert in the original. I also read the relevant sections of Smirnov's *Course on Higher Mathematics*.

E. D. If I am not mistaken I learned the Hilbert approach based on complex variables from you. It doesn't happen as often these days that I have a student who can teach me something.

M. M. To make a long story short, by the beginning of my fifth year I completely changed my approach. Of course I continued to work within the context of probability theory but the method was completely different. I started using the method of barriers, a very basic method which was never applied to this problem. This way I very quickly managed to deal with solutions with singularities at tangent points of the vector. However, I still had to find a way to get smooth solutions. To this end Hilbert used complex variables, but this was an artificial approach. The solution came to me suddenly in the middle of night at three o'clock. Extension of the probabilistic approach to the 3-dimensional case was the subject of my Ph.D. thesis.

F. Mekhmat 1993-1995
(Interview 2, 51:30-55:48)

M. M. I want to share with you my impression of the state of mathematical education in recent years. Up to 1995 I was teaching introductory courses on random processes and probability theory, and here is what I noticed. Secondary schools produce a fair amount of talented students who are genuinely interested in math. They get into Mekhmat and for the first couple of years study with passion: they work on problems and it's easy to communicate with them. I couldn't help falling in love with students I taught. Such wonderful kids!

It is also interesting that even today Sadovnichy admits students from the former republics of the USSR without charging tuition. They receive stipends and are treated as if they are citizens of the Russian Federation. In a sense, it is a paradise of mathematical education. But by the time they start their third year their attitude changes drastically. Take the class on random processes for example. For many years this class was taught by Yuri Anatolievich Rozanov. This was a disaster. The ego of this man knows no bounds. An obligatory course for hundreds of the third-year students, scheduled in the largest lecture room 0.2 was attended usually by about five persons. So the bulk of the work was done by people who taught exercises. I tried to do my best to fill the gaps. I tried to explain the subject. There was no use trying to tackle problems because they had no foundation whatsoever. Basically, I had to give lectures myself in addition to showing them how to solve problems. It was absolutely futile. Even when I felt that I managed to spark some interest during one particular session, there is not much I could do because the same students did not show up for the following session. Moreover, nobody worked on the problems that I assigned.

E. D. What year was that?

M. M. This was 1995. But the situation was typical of the 90s in general. The foundations of mathematical education were completely lost. There was absolutely no control over what was going on in the classroom. There was no communication with students. I also think that the diploma of the MSU does not carry the same prestige as in the past.

I know it's a serious statement. The diploma issued by the MSU is equivalent to the Master's degree here in the US. It would be nice if it continued to be this way because MSU students coming to the US are still more proficient than their American peers.

E. D. It depends on what American university you choose to compare.

M. M. But the level of knowledge is nowhere near what it used to be. No doubt, the Golden Age of mathematics in Mekhmat is over. The MSU simply does not prepare creative and hardworking mathematicians. There are of course a few exceptions but the mass production is finished.

E. D. There was always a huge gap between the top of the class and weaker students. Andrey Nikolaevich used to say that Mekhmat produced scientists and waste.

G. Music

(Interview 2, 1:07:10-11:11)

M. M. In the Mechnikov Scientific Research Institute of Vaccines and Serums where my mother worked, there was a professor who taught philosophy. He held a concurrent professorship of philosophy in the Moscow Conservatory. My mother and he were friends. One day he suggested my mom to take me to an audition in the Conservatory. I was only five years old. Myself and another kid emerged as the winners. I vaguely remember that there were some graduate students who worked with us after the audition.

Later, when I was six, the graduate student who tutored me left. He was Latvian or Lithuanian. My parents sent me to a music school, but I flunked the entrance exams. My mom was upset and decided to hire a private tutor. At that time my dad was a high ranking military officer, so money was not a problem for us. Among people of my dad's social standing it was considered prestigious to homeschool one's kids by hiring private tutors. From an early age I had a tutor in English, which proved to be very useful, and I had a tutor in music. My schooling in music, however, didn't go well at all. I don't think my tutors were good teachers. They simply couldn't spark my interest. My parents changed seven tutors in music, all of whom were appalled by the fact that I never did my homework.

E. D. Did your parents punish you?

M. M. My father used to slap me every now and then but not because of that. I was a well-behaved kid. In this case, it wasn't my fault. Rather, the method of teaching itself was profoundly flawed. I knew a lot of children of military officers who were privately tutored in music and yet had no interest in whatsoever.

The whole system of musical education in Russia, in my opinion, was flawed. It was based on a pedagogical method that did not encourage interaction between the teacher and the student. Likewise, it did not involve joint performance. The teachers of music were only interested in preparing professional musicians. A kid who wasn't gifted or interested enough to become a professional musician didn't retain anything from this kind of instruction.

But I was lucky, when for the first time in my life a teacher of music expressed a genuine interest in me. This person was Angelina Sergeyevna Shapran.

(Interview 2, 1:19:12-1:31:00)

E. D. Do you still play piano?

M. M. Yes, I do.

E. D. Do you have an instrument at home?

M. M. I used to have one in my old apartment in Boston. But I have had a hard time finding a place for it in my new house. I couldn't haul it up to the second floor. I used to have a wonderful instrument back in Moscow, but unfortunately I couldn't take it with me.

E. D. Perhaps there is a way of bringing it to the US. It must cost a lot of money though.

M. M. Yes. First of all, it is extremely expensive. Second, you have to clear it at the customs. It's a major headache.

E. D. I guess it's much easier to buy a new one.

M. M. I still practice, although not regularly. As a student, I practiced a lot, one or two hours every day. I played all the sonatas of Beethoven and Schubert. Then little by little I also started singing.

E. D. The advantage of singing is that you don't need any instruments.

M. M. No, you certainly do. One needs an accompaniment in order to stay within the tonality of a song. It wouldn't work otherwise.

Again, the motivating factor was completely random. In 1970, when I was a scientific secretary in Kolmogorov Laboratory, we received a request from Bulgaria to teach a course of lectures on random processes. Sergey Vasilievich said: "Let's send Misha". Andrey Nikolaevich said: "Alright".

E. D. Do you mean Sergey Vasilievich Fomin.

M. M. Correct. He served as the deputy of Andrey Nikolaevich for a long time.

E. D. A very good person as far as I know.

M. M. True. But I am not sure he played any significant role in the development of our lab. His research had nothing to do with statistics, and although his overall influence was positive, the actual impact on our lab was minimal.

Anyway, when I came to *partkom*,²¹ they said: “You are too young for this. Have you ever taught a series of lectures on the subject?” In my foolish naïveté I decided to be honest: “No, I haven’t. But I learned the subject from Kolmogorov.” “Alright,” they said, “we’ll give him a call.” I went to Andrey Nikolaevich and explained what happened. He said that he would call them and settle the matter. Fortunately for me, the request was issued by *Vneshtekhnika*²² and it was based on a contract that they had with the Bulgarian side. *Vneshtekhnika* had to fulfill its obligations under this contract. The main concern of *partkom* was my ability to represent the Soviet science in an adequate way.

It is very interesting how this story ended. I was supposed to go to Bulgaria in February and teach a course of lectures till May. It was my first trip abroad, even though it was a country of the Eastern bloc. Bulgaria is a fascinating country, and I really enjoyed my trip. In the end of March, *Vneshtekhnika* started to worry. Its obligations under contract were overdue, and they were liable for damages. I told them: “What can I do? *Partkom* doesn’t allow me to go.” They were outraged. On the following day I was free to go.

I prepared very quickly and gave a series of lectures. It was a very useful experience. Andrey Nikolaevich was of the opinion that giving lectures in Bulgaria would prepare me for giving the same lectures at home.

I finished my work in May, but under the terms of my contract I had to stay in Bulgaria for another two months. So I had two months to explore the country, and I think I visited every single mountain in it. I also bought a collection of songs by Schubert. It was much easier to find scores in Bulgaria than in Moscow. There was a piano in the club of the Soviet embassy which was close to my hotel. Since I had plenty of spare time, I played the piano and sang quietly to myself. The workers of the embassy noticed that and immediately recruited me for their activities. Emphasis on cultural cooperation and exchange with Bulgaria was a major policy component of the Soviet diplomatic mission in Sofia. The

²¹ Party committee.

²² It is the subsidiary organization of Ministry of education and science. operating in different sectors of science and technology, education, industries, agriculture, healthcare.

embassy provided me with teachers. There were a lot of great specialists there. The person in charge of my instruction was a Russian émigré who had fled from the Revolution in Russia and worked in a radio station in Belgrade. After WWII, when the tension between Tito and Stalin flared up, he decided to go back to Russia. However, the Soviet authorities didn't allow him to return, and so he ended up somewhere in between. He was true patriot of Russia and an expert of his art. This man taught me to sing, and I even participated in a number of concerts, including one that was attended by the Soviet ambassador.

Another fortunate circumstance was that he had an assistant who was married to a deputy minister of transportation. They were from the family of Bulgarian expats who lived in Russia for a long time and were culturally assimilated. To make a long story short, we became friends, and the couple showed me the entire country. At that point I realized that there was some benefit to be derived from my musical inclinations. I visited the best music salons in the country.

This experience revived my interest in singing. From that point on, I started taking it more seriously. The next stage in my singing career was when I joined an opera troupe called *Camerata*. Originally *Camerata*²³ was a group of singers directed by Claudio Monteverdi. Their singing was a renaissance predecessor of the opera. None of the members of our troupe were academics. All of them were graduates of the vocal school in the Bolshoi Theater. Since most their bills were paid by the MSU, they needed at least one person with ties to the university. That's why I managed to get in very easily. I never was a lead singer. We usually performed ancient operas. For example, we performed Purcell's *Dido and Aeneas*, an opera with many choirs and few soloists. We also performed some old Russian operas and a few modern ones.

E. D. What about *Eugene Onegin*?²⁴

M. M. No, of course not. Our troupe was too small for that. We were seven or eight people. We would never be able to pull it off. There was another troupe whose members were students. They performed operas requiring a large number of people. They had costumes and props. But I doubt that even they could perform *Onegin*. Our troupe had no

²³ http://en.wikipedia.org/wiki/Florentine_Camerata

²⁴ http://en.wikipedia.org/wiki/Eugene_Onegin_%28opera%29

costumes. What we did was more of a concert performance. But we had a director who was an outstanding professional, a young man by the name Ilya Podkaminsky.

(Interview 2, 1:31:00-1:48:00)

M. M. [*Singing*]

(1) Russian orthodox chant entitled 'Да исправится молитва моя' ("May my prayer be set"). The lyrics are borrowed from the Book of Psalms:

May my prayer be set before you like incense, and the lifting up of my hands as the evening sacrifice!

O Lord, I call upon you; hasten to me! Give ear to my voice when I call to you!

May my prayer be set before you like incense, and the lifting up of my hands as the evening sacrifice!

Set a guard, O Lord, over my mouth; keep watch over the door of my lips!

May my prayer be set before you like incense, and the lifting up of my hands as the evening sacrifice!

Do not let my heart incline to any evil, to busy myself with wicked deeds.

May my prayer be set before you like incense, and the lifting up of my hands as the evening sacrifice!

(Psalm 141:1-4)

(2) The Prayer of Francois Villon by Bulat Okudzhava (translated by Alec Vagapov)

While the world is still turning, and while the daylight is broad,

Oh Lord, pray, please give everyone what he or she hasn't got.

Give the timid a horse to ride, give the wise a bright head,

Give the fortunate money and about me don't forget.

While the world is still turning, Lord, You are omnipotent,

Let those striving for power wield it to their heart's content.

*Give a break to the generous, at least for a day or two,
Pray, give Cain repentance, and remember me, too.*

*I know You are almighty, and I believe You are wise
Like a soldier killed in a battle believes he's in paradise.
Like every eared creature believes, oh, my Lord, in You,
Like we believe, doing something, not knowing what we do.*

*Oh Lord, oh my sweet Lord, my green eyed Lord, You're good!
While the world is still turning, wondering, why it should,
While it has got sufficient fire and time, as You see,
Give each a little of something and remember about me!*