
Vershik Anatoly M., Ithaca, New York, March 15, 1990; Highlights¹

A. Early Biography

E.D. How did you get interested in mathematics? There were many mathematical circles² and Olympiads in Moscow. Were there any in Leningrad?

A.V. While in high school I used to buy every book on mathematics I could, including *Mathematical Conversations* written by you. There were not many books available, so that as a high school student I could afford buying virtually all of them. I don't know why I got interested in mathematics. I wasn't sure what I wanted to do in my life. I had other interests as well, but I knew that eventually I had to choose.

There was a permanent mathematical circle at the Pioneers Palace³. In fact, before the 60s it was the only one in Leningrad. I didn't want to join it for some reason. I joined the lesser-known mathematical circle hosted by the Leningrad University. When I was in the tenth grade, it was supervised by Misha Solomyak, who is a good friend of mine now. A few years later, when I was a university student, I supervised it myself. Serezha Maslov⁴ was one of my

¹ The interview is presented by its highlights A, B, C, D related to four parts 1, 2, 3, 4 of the corresponding audio as follows:

- A. Early Biography
 - a. Books, Math Circles, Olympiads - Part 2, 00:00-3:27
 - b. Admission to the Leningrad University - Part 2, 3:28-10:47
- B. St. Petersburg School of Mathematics - Part 2, 16:36-29:00 and 38:30-41:32
- C. Rokhlin – Part 2, 36:56-47:07 and Part 3, 14:50-25:16
- D. Ladyzhenskaya – Part 3, 36:56-47:07 and Part 4: 00:00-13:45

² Mathematical circles [“kruzhki”] for gifted high school students, originated at Moscow State University in 1930s, were run by the university students. The system, spread gradually throughout the country, is quite different from any form of work with motivated high school students in the USA.

³ http://en.wikipedia.org/wiki/Pioneers_Palace.

⁴ <http://www.mathsoc.spb.ru/pers/maslov/mints.html>.

students. He also supervised it later, and one of his students was Misha Gromov⁵.

While in school I participated in science Olympiads. I won prizes in a physics Olympiad in the eighth grade and in a mathematics Olympiad in the tenth grade. At the time there were no science competitions at a national level.

E.D. When did you apply to the university?

A.V. In 1951.

E.D. Did you have any problems getting in?

A.V. Oh, very much so! I grew up without being aware of antisemitism. I went to a very good school, the Peterschule. It is located on the Nevsky Avenue⁶ and is one of the oldest in St. Petersburg. There were many Jewish students and teachers. Later, after I graduated, I spoke to my former teachers about it, and they said that, though antisemitism existed, it was not felt within the school walls. It was 1950.

E.D. In the 50s antisemitism was rife throughout the country.

A.V. You are right, but I have good memories of my high school years, which is quite unusual. We had high-quality teachers. So when I applied to the university, I naively assumed that my honors diploma and awards in science Olympiads would guarantee admission. When I came for my interview, one of the people on the committee glared at me and asked: "Why do you apply to the Department of Mathematics and Mechanics?" I wasn't expecting this sort of question, given my high school credentials. I humbly replied that I was interested in mathematics and even participated in a mathematics Olympiad. "We don't care!" he yelled. The committee followed up with a very basic question about the tangent graph, but I already was dejected, feeling that something went wrong.

⁵ [http://en.wikipedia.org/wiki/Mikhail_Gromov\(mathematician\)](http://en.wikipedia.org/wiki/Mikhail_Gromov(mathematician)),
<http://www.nytimes.com/2009/06/01/nyregion/01nyu.html>.

⁶ The main street in St. Petersburg.

When I told my mother about it, she said that I should apply to a different university. I was extremely disappointed and could not understand what I did wrong. I knew that antisemitism existed, but I thought that to be admitted to the Department of Mathematics and Mechanics one only had to have some solid credentials and I was convinced that I had them. For some reason I was invited for a second interview. This time the committee did not ask any questions at all. In fact, they seemed surprised to see me again. They said: 'We already had an interview with you. What else do you want?' I left fully convinced that my application was accepted. Without further ado, I went straight to the Komsomol⁷ committee and volunteered for a construction project away from Leningrad for the whole summer. When I came back, I found out that I hadn't been admitted when I had left. As a matter of fact, I didn't get admitted until late August. What happened was as follows. My mother was constantly checking the announcement board to see my name posted among those who were admitted. Having not found it, she went to the *partkom secretary*.⁸ She asked him: 'Was my son rejected because he is Jewish?' The secretary seemed to be a rather honest man. He looked over my documents and agreed to reverse the decision of the admission committee.

E.D. So you were accepted in the very last moment.

A.V. Yes, and I was the only Jewish student in my year. The following year there were no Jews admitted at all.

B. St. Petersburg School of Mathematics

E.D. Please, tell me about the Leningrad mathematics.

⁷ <http://en.wikipedia.org/wiki/Komsomol>.

⁸ The head of the university Communist Party organization.

A.V. The Leningrad school of mathematics descends from the old St. Petersburg school. Recently I was contracted to write a history of the St. Petersburg Mathematical Society for its newly established publication series. The society was founded at the end of the 19th century but then disappeared. It was revived thanks to Steklov in 1921. This was a direct line from the old St. Petersburg school of Chebyshev,⁹ Lyapunov,¹⁰ Markov,¹¹ and others. The line continued through Steklov, Gunther, and of course Smirnov, who was the most immediate link between the old and the new school. Before 1934 Leningrad was the home of the Russian Academy of Sciences. At the time, with a few the exceptions (Luzin¹² in Moscow,

N. M. Krylov¹³ in Kiev) mathematicians who were members of the Academy (including Vinogradov¹⁴ and Bernstein¹⁵) lived in Leningrad.

So the society was revived in 1921. Steklov passed away in 1926. Then, in the end of the 20s and early 30s, came the period of severe repressions against the intelligentsia. Egorov,¹⁶ the president of the Moscow mathematical society, lost all his academic positions and was exiled to Kazan, where he died in a prison hospital. (I have heard this awful story from Laptev, and I am quite surprised it has not received the publicity it deserves). At that time Smirnov, who on the one hand understood what was going on but on the other hand was closely affiliated with the upper echelons of the communist regime, came up with an ingenious idea. He proposed to dissolve the Leningrad society of physics and mathematics, thus saving its president at the time - Günter¹⁷, who was very

⁹ http://en.wikipedia.org/wiki/Pafnuty_Chebyshev).

¹⁰ http://en.wikipedia.org/wiki/Aleksandr_Lyapunov.

¹¹ http://en.wikipedia.org/wiki/Andrey_Markov.

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

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

¹⁴ http://en.wikipedia.org/wiki/Ivan_Matveyevich_Vinogradov.

¹⁵ http://en.wikipedia.org/wiki/Sergei_Natanovich_Bernstein.

¹⁶ http://en.wikipedia.org/wiki/Dmitri_Egorov.

¹⁷ Guenther N. M. (1871- 1941), President of the Leningrad Mathematical Society in 1923--1930 (<http://www.mathsoc.spb.ru/pantheon/guenter/index.html>)

outspoken and therefore inconvenient for the communist authorities. As a result, Günther became a regular professor at the Polytechnical University and eluded persecution. This was the end of the society. It was revived only in 1959.

A very significant event took place in the 20s: Yakov Uspensky, a distinguished member of the Academy, fled to the US and stayed there. Later I realized that excellent familiarity of the American scholars with Markov chains is due to him. Another example is Bezikovich, who fled from the country by crossing the border. Among those who fled was also Tamarkin,¹⁸ who was a colleague and good friend of Smirnov. Apart from them, there was also such an important scholar as Friedmann,¹⁹ who died quite early. He was a friend of Smirnov since high school.

In the 30s the situation was as follows. There was Smirnov with a number of talented young students, like Sobolev.²⁰ There was Fichtenholz, who had a genius

student, Kantorovich.²¹ There were talented young people like Dmitry Faddeev²², Markov Jr.,²³ and Alexandrov.²⁴ I must also say that everyone was under the influence of Delone,²⁵ who was in Leningrad before the transfer of the Academy to Moscow.

E.D. I know him pretty well. When I was still a freshman, he used to invite me to his house. He liked being in the company of young people. He also liked gossip.

A.V. I know. I heard it from many people. Gossip-mongering is still very much characteristic of MIAN, and Delone is partly responsible for that.

¹⁸ http://en.wikipedia.org/wiki/Jacob_Tamarkin.

¹⁹ http://en.wikipedia.org/wiki/Alexander_Friedmann.

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

²¹ http://en.wikipedia.org/wiki/Leonid_Kantorovich.

²² <http://www-history.mcs.st-and.ac.uk/history/Biographies/Faddeev.html>.

²³ http://en.wikipedia.org/wiki/Andrey_Markov_%28Soviet_mathematician%29.

²⁴ http://en.wikipedia.org/wiki/Aleksandr_Danilovich_Aleksandrov.

²⁵ <http://www.univer.omsk.su/LGS/Delone.html>.

E.D. But I assume that it is no longer common to gossip with freshmen.

A.V. His influence is evident in publications. Unfortunately, nobody in MIAN studies the history of scholarship in earnest; history is not merely textual analysis but the tracking of influences, which is much more difficult and interesting. I can feel the influence of Delone on Faddeev and Alexandrov.

As to the post-war period, when I was a student, I can simply list people by names. For example, Fichtenholz, who was a university professor *par excellence*. I took his class on the Metric Theory of Functions; Faddeev, a brilliant lecturer and a man of moral integrity, unlike his son; Alexandrov; Markov, whose class on theoretical mathematics I also took; Linnik, who taught juniors and seniors.

E.D. Linnik was probably a bad teacher, wasn't he?

A.V. Yes, but he was a remarkable person and a good mathematician, although his research is not quite to my taste. In the 60s came Rokhlin.

E.D. You were already a graduate student, right? Who was your adviser?

A.V. Yes, my adviser was Akilov²⁶. Now that I mention Akilov, I should also add Kantorovich. These were the two major figures in the field of Functional Analysis. They co-authored a book.

E.D. I met Akilov in Novosibirsk in 1968. He seemed a very nice person.

A.V. 'Nice' is probably not the right word. He was a man who understood what was going on around him. He dodged the draft during WW2 on ideological grounds. He didn't want to fight for the Communist regime, and he was quite outspoken about it with those of his students whom he trusted.

A.V. After graduating from the university I worked for two years at a computer center. While I was there, I discovered linear programming. Linear

²⁶ Gleb Pavlovich Akilov (obituary), Russian Math. Surveys, 1988, [43 \(1\)](#), 221-223.

programming was developed in 1939 by Kantorovich. It was a truly great invention.

E.D. It was also developed independently by Dantzig.

A.V. Well, Dantzig came up only with the simplex method. One should probably mention von Neumann in this regard. Anyhow, Kantorovich did a more thorough job. Later, however, he stopped referring to it completely. Initially his method found some practical application in industry, but in reality it was a high level science. He was almost thrown to jail for developing it and therefore refrained from talking about it until 1956.

In 1957, while working with certain tables I needed to use Chebyshev's approximation, and Akilov recommended discussing my problem with Kantorovich. This was my first encounter with linear programming. I was one of the first people to learn about it. By that time this method was already well-known in the US and, as is often the case, scholars in Russia were learning about it from there. I tried as much as I could to promote linear programming. But Kantorovich was already garnering success and, as you know, eventually received the Nobel Prize. It is also worth mentioning that I got a job in the Leningrad State University not as a mathematician but as a specialist in linear programming. Moreover, to this day I formally belong to the Department of Operations Research and not Department of Mathematics.

C. Rokhlin

E.D. Please, tell me about Rokhlin. There is hardly anyone who knew him better than you. He was a remarkable person.

A.V. No doubt, Rokhlin was an outstanding personality. But, it often happens that remarkable people do not get to live an easy life.

E.D. True, their lives are often full of adversity.

A.V. The first time I met him was at a conference on Functional Analysis in Moscow in 1956. I was then a student. He was giving a talk on something that had to do with Topology. I couldn't understand anything. At the time it was a whole new and incomprehensible world for me. Next I met him a few years later at a conference in Baku. This time around he was giving a brilliant and perfectly clear presentation on the Kolmogorov entropy, which had been devised shortly before that. By that time in Leningrad we were already warming up to Ergodic Theory.

E.D. Where was he at that time?

A.V. He was in Kolomna. He was born in Baku. His father Abram Rokhlin was Jewish and an active menshevik.²⁷

E.D. Was it before the revolution?

A.V. Yes. Mikoyan²⁸ mentions Abram Rokhlin in his rather loathsome memoirs, alleging that in 1918 he had attempted to interfere with Mikoyan's political affairs in Azerbaijan. None of this is true, of course, because at the time Rokhlin the father was no longer a menshevik; he was gradually transforming into a bolshevik.²⁹ Later he worked at low level administrative positions in various parts of the country. This is why Vladimir Rokhlin graduated from high school in Alma-Ata.³⁰ Rokhlin the father, however, was eventually thrown into jail

²⁷ Mensheviki and Bol'sheviki were two factions inside the Russian Social Democratic Party in the early 20th century: (<http://en.wikipedia.org/wiki/Menshevik>).

²⁸ A Soviet statesman during the eras of Lenin, Stalin, Krushchev, and Brezhnev: (http://en.wikipedia.org/wiki/Anastas_Ivanovich_Mikoyan).

²⁹ A faction of the Russian Social Democratic party in the early 20th century which eventually became the Communist Party of the Soviet Union.

³⁰ The largest city and the former capital of Kazakhstan (presently renamed Almaty).

and executed, although the precise details are unknown. When this happened, Rokhlin was already a student in the Department of Mechanics and Mathematics at the Moscow State University, where he had been admitted at the age of 16. Luckily, he did not bear the full brunt of persecution in the wake of the arrest. He was not expelled from the university but was disqualified from undergoing basic military training.

E.D. Sorry for interrupting. Were there any “enemies of the people”³¹ in your own family?

A.V. No, but when my father defended his dissertation in 1945 or 46, the official opponents in his defense were later declared “enemies of the people”. At the time of “the Leningrad Affair”,³² they— serious economists Reihard and Rosenfeld —were imprisoned. One of them died in jail. The other returned back later. As a result, an anonymous informer questioned the validity of my father’s degree on the grounds that his opponents had been declared “enemies of the people”. In 1950, when he was teaching at a military academy, he was stripped of his degree precisely on this basis. He was discharged from the military and expelled from the Communist party. In 1952 he was unemployed and was forced to work as a type-setter, an occupation he had had before he went to the university. He passed away before suffering more severe repercussions. Later I learned that his imprisonment was inevitable. So fortunately there were no “enemies of the people” in my family.

E.D. Let’s get back to Rokhlin.

³¹ A term used by the communist authorities to refer to anyone they considered a threat. Once declared an “enemy of the people”, a person could be imprisoned, expelled, executed, and lose property to confiscation.

³² The Leningrad Affair was a series of criminal cases fabricated in the late 1940s–early 1950s in order to accuse a number of prominent members of the Communist Party of treason and intention to create an anti-Soviet organization out of the Leningrad Party cell: (http://en.wikipedia.org/wiki/Leningrad_Affair).

A.V. When Rokhlin graduated from the university, he was recommended for a Ph.D. program by a number of professors. His adviser was Abraham Plessner,³³ who is a remarkable personality in his own right.

E.D. Again sorry for interrupting, but these facts of his biography are well known. Tell me what you know about him from your personal interaction. How did you meet him?

A.V. In Leningrad we used to have a study group for young people. We studied Ergodic Theory from the books of Halmos,³⁴ and other sources

E.D. Who was in this group?

A.V. There were several people, more or less of my age.

E.D. Who organized it?

A.V. There were Sudakov, Makarov.

E.D. Makarov?

A.V. Boris Makarov. You are not familiar with him. There were all kinds of people. By the way, Kagan, who was a Ph.D. student in statistics, also participated every once in a while. So by the time of Rokhlin's arrival in Leningrad, there was already a group ...

E.D. So what was happening when he arrived?

A.V. There were a few people who were interested in this kind of research. But, on the other hand, everyone knew that Rokhlin's arrival signaled something special. He brought two things: first, Ergodic theory, which was a trendy field because the era of entropy had just begun; and, second, Topology, which was even trendier. There was no specialist on Topology in Leningrad, and this was precisely why Alexandrov³⁵ invited Rokhlin in the first place. Although you say that the basic facts of his life are well known, it is difficult to understand Rokhlin's

³³ http://en.wikipedia.org/wiki/Abraham_Plessner.

³⁴ http://en.wikipedia.org/wiki/Paul_Halmos.

³⁵ Rector of the Leningrad University.

situation without taking into account the vicissitudes of his life during World War II.

He was in a military reserve force. He was taken prisoner by the Germans, survived captivity, and escaped. Upon his return, he spent some time in the so-called filtration **camps** for returning Soviet prisoners of war. He was released only thanks to the letters of Kolmogorov³⁶ and Pontryagin,³⁷ although there are different views on this matter. For example, some people say that their letter arrived somewhat late—when Rokhlin was still under custody but no longer formally a prisoner—and in fact may they may have delayed his release.

At any rate, in the end of 1946 he returned to Moscow and took only three years to brilliantly defend both of his dissertations on Ergodic theory, receiving positive reviews from Kolmogorov, Pontryagin, and others.

Then began a period of anti-cosmopolitanism and greater suspicion on the part of the Communist regime. He was fired from Steklov Mathematical Institute where he worked as an assistant of Pontryagin. He then moved to Arkhangelsk and then to Ivanovo and Kolomna, at which point Alexandrov offered him a position in Leningrad. Shortly after his arrival, we formed a seminar consisting of people who already had a fair amount of expertise: Ibragimov,³⁸ Sudakov, Makarov, Kagan, and later Yuzvinsky, two of whom are now in the US; some younger people as well: Zaidman and Belinskaya. It was a very lively and stimulating seminar which allowed Rokhlin to flourish because prior to Leningrad he had had little if any mentoring experience. He supervised two graduate students. One of them was Abramov, who defended his dissertation on entropy and moved to Leningrad earlier.

³⁶ http://en.wikipedia.org/wiki/Andrey_Kolmogorov.

³⁷ http://en.wikipedia.org/wiki/Lev_Pontryagin.

³⁸ <http://www.jstor.org/stable/2245822>.

Rokhlin came to Leningrad riding a wave of positive momentum. It bears mentioning that prior to that he had some complications with the authorities in Ivanovo as a result of his involvement in ideologically subversive literary discussions. His first years in Leningrad were simply wonderful. Gradually though the momentum began to wane. What happened to his son was the last straw. In 1974 he had a massive heart attack. How this happened even I can't say, even though we used to go for summer vacations to the same small place in Estonia. After the heart attack, which was quite serious, his son emigrated, and everyone in Leningrad thought that it was only a matter of time before Rokhlin would follow him. At any rate, the whole situation had a negative impact both on his health and on his position in the department. Rokhlin's wife, Anna Alexandrovna, whom I love dearly and often talk to, is very much emotionally attached to her son. He often calls her. Rokhlin was not an easy person to get along with, but his wife is a remarkable person, and he always treated her with care and affection. They were a well-matched pair.

As I said earlier, everything went well in the beginning. Leningrad was lucky to have him. His major contribution was not so much his research but the fact that he managed to build a bridge between Moscow and Leningrad. Leningrad is indeed a very special city. In the 19th century, as you know, it was under a heavy French influence. Nevertheless the Leningrad school of mathematics was a isolated branch in sense, for it received very little external input. Even though there were a number of big names, few people worked on modern mathematics: for example, Faddeev, who was a top-notch specialist. Linnik was probably a separate figure.

E.D. Yes, he should be considered apart.

A.V. Rokhlin had his roots in Moscow, which was the navel of the world for us at the time. His impact cannot be attributed only to the fact that he brought Topology but to the broad network of his personal connections. I realized the significance of his arrival quite early. Although I already had an adviser, Akilov,

and had some research topics, I realized that Rokhlin's arrival foreshadowed the beginning of something new, something where I could find a place for myself. Few people understood that, and many of those who did were afraid. It was a little different for people like Gromov, who were at the beginning of their academic careers and considered Rokhlin as belonging to the Leningrad school. Not so with me. In the final analysis my realization proved to be correct, for I made a lot of friends with scholars from Moscow.

E.D. And with scholars from the US.

A.V. Personal connections were very important, especially because both Topology and Ergodic theory were on the rise. On the other hand, it hurts me to remember how he was being forced to retire. It was awful. You probably don't know about it.

E.D. No, I don't. Tell me more.

A.V. The Leningrad University moved to Petergof thanks to A. D. Aleksandrov, who probably visited Cornell at some point.

E.D. No, he didn't.

A.V. He may have been here before you.

E.D. Could be, but certainly not while I've been here.

A.V. Of course, when you moved here, he was no longer the rector of the University. He traveled abroad way back when nobody was yet allowed to. He was familiar with all these beautiful college towns, like Cornell, which it is difficult not to fall in love with; everyone wants to have something similar in their own countries. He didn't understand, however, that trying to replicate them in the Soviet Union might have negative consequences; and so it happened indeed. He later attributed his decision to the fact that he was not properly informed in what direction the city of Leningrad would develop. He once told me on a train packed with students: "I put my trust in the plan of the party", which meant that, according to the plan of the Communist party, the city was supposed to develop southward and not northward, as it in fact did. In reality this is all irrelevant.

Regardless of the place, any transfer would have been a disaster. When the university moved to Petergof in 1979, people such as Rokhlin, who was not quite healthy, were not able to commute. As a result the Department of Mathematics and Mechanics lost a lot of highly qualified faculty. Reasonable people would have allowed him to teach at LOMI³⁹ in order to retain such a valuable specialist, but the Department did the exact opposite, claiming that he could no longer fulfill his teaching duties. Yet at the time he was not teaching the general course anymore. He had passed it to Viro⁴⁰. The course was well developed and other people could teach it. He taught only specialized courses and supervised graduate students. This was the period of the “Brezhnev Stagnation”.⁴¹ Given that his son lived abroad, the administration decided to retire him.

E.D. Very humane treatment in comparison to the Stalin era.

A.V. Borevich, the dean at the time, was the foremost proponent of Rokhlin’s retirement.

E.D. The co-author of Shafarevich?⁴²

A.V. Yes.

E.D. Which of them is a ‘better’ person?

A.V. Good question. When Shafarevich was a dissident, everyone told me not to invite him because this would drive Borevich crazy. Borevich did his best to conceal the fact that he co-authored a book with Shafarevich. Later, however, he was willing to emphasize this fact. Now he tries to explain that he is not the one to blame. So he followed the instructions of KGB. He called Rokhlin and told him that the Department could not keep him. Rokhlin did not resist. Others, however, including me, did. I tried to talk to various people. All we could do, however, was

³⁹ Leningrad Branch of Steklov Institute of Mathematics.
(http://en.wikipedia.org/wiki/St._Petersburg_Department_of_Steklov_Institute_of_Mathematics_of_Russian_Academy_of_Sciences).

⁴⁰ en.wikipedia.org/wiki/Oleg_Viro.

⁴¹ Refers to the period of economic stagnation that started in the 70s under Leonid Brezhnev:
(http://en.wikipedia.org/wiki/Brezhnev_stagnation).

⁴² http://en.wikipedia.org/wiki/Igor_Shafarevich.

to keep him for another year in the capacity of Professor-Consultant, and even that was pretty difficult. I also tried to pass this story on to people in the US, saying that Rokhlin was only sixty years old and is still perfectly capable to work.

E.D. I didn't know anything about it.

D. Ladyzhenskaya

E.D. Tell me about Ladyzhenskaya. I have known her for a long time.

A.V. With pleasure. Olga Aleksandrovna is a very special person to me, and I would be happy to talk about her. What would you like me to talk about?

E.D. I know a few things about her early life, but maybe you could remind me.

A.V. Her mother was Estonian. By the way, I discovered that when my daughter started learning Estonian. Her father belonged to the Russian intelligentsia. He was a teacher in a small town of Kologriv. He was an honest and respectable man, who was arrested and perished at the hands of the communists. About two years ago a movie director from Leningrad shot a movie about Tatyana Zaslavskaya,⁴³ Olga Ladyzhenskaya, and another woman with whom I am not familiar. Knowing that Olga Ladyzhenskaya likes to share her personal story with other people, I was expecting to hear it again in this movie. To my utter surprise, however, there was not a much about her at all. In fact, if the narrator had not mentioned that she was a famous mathematician, it would have been unclear who this petite, elderly lady was and why she was talking about her father. She was telling a very touching story about how her father was trying to save the children of a priest whom the communist authorities were about to exile, and how the people of Kologriv were trying to resist his own arrest later

⁴³ Soviet and Russian economical sociologist, one of the theoreticians of perestroika, an author and co-author of several books on economy of the Soviet Union: (http://en.wikipedia.org/wiki/Tatyana_Zaslavskaya).

on. I could not listen to all that without tears—a horrible story indeed. Incidentally, Olga Ladyzhenskaya was acquainted with Solzhenitsyn,⁴⁴ who visited Leningrad in the 60s. She must have told the story of her father to Solzhenitsyn, because he is explicitly mentioned in *The Gulag Archipelago*. The fact that the novel talks about real people is precisely what makes it such a powerful narrative of personal suffering and heroism. On the other hand, it is absolutely clear that there were millions of people with very similar stories.

E.D. True, to shape the material at his disposal the way he did is a sign of a gifted writer.

A.V. I bring up this point for a reason. I used to hear from certain people that Solzhenitsyn based his novel on the testimony of 220 people, which one could argue is not a representative sample. It is a small number indeed, especially considering the scale of the tragedy. Yet the stories he chose were very much on point, and the story of Ladyzhenskaya's father is a good example in that respect.

I don't know exactly what happened next. In the 30s she was still in school. She was a smart kid. She was admitted into the university, and graduated in Moscow.

E.D. I don't know why she went to Leningrad.

A.V. I don't know either. I never asked her about it. But what I know is that she always had good things to say about her graduate adviser, Petrovsky.⁴⁵ Moreover, she has always been on good terms with many people from the Moscow State University. Gelfand is a case in point: she never criticizes him too harshly. When I worked with Gelfand, she told me a humorous story about him. She said that once she had attended one of his lectures. There Gelfand

⁴⁴ Russian writer, historian, and political dissident, particularly known for such works as *The Gulag Archipelago* and *One Day in the Life of Ivan Denisovich*: (http://en.wikipedia.org/wiki/Aleksandr_Solzhenitsyn).

⁴⁵ I. G. Petrovsky was the rector of Moscow University between 1951 and 1973. (http://en.wikipedia.org/wiki/Ivan_Petrovsky).

presented a theorem and promised to prove it later. In the following lecture he reiterated the promise, and so it went on and on. He never made good on it. More recently, she told me that the theorem presented by Gelfand has not been proven to this day.

She moved to Leningrad in 1947. Again I don't know many details, but she quickly developed a good rapport with Smirnov,⁴⁶ for whom she had a tremendous amount of respect. Smirnov in his turn always supported her, as also did the then rector of the Leningrad University, Alexandrov, who endorsed her promotion. She climbed the academic ranks very quickly and soon became a professor. For the most part she worked in the Department of Physics. She worked in various fields of mathematical physics, where she made a name for herself. It was mathematical physics *à la* St. Petersburg, although one could say that this style is no longer peculiar to them because Sobolev's embedding theorem has become mainstream these days. She participated in Smirnov's seminar, and now she is in charge of it.

But let's talk about something else, her other qualities. She is a profoundly religious person, which I think can be attributed to the influence of Smirnov.

E.D. Smirnov was religious as well, right?

A.V. Not only that, he was very active in his parish. His father was a priest. He was always a deeply religious person and never made a secret of it. When he passed away in 1974, the burial service took place in the church.

E.D. I know that she attended.

A.V. I also attended, but the thing is that back then it was considered, for all intents and purposes, illegal. Only because it was Smirnov, the authorities had to allow an additional, civil funeral service in the Academy, which however never took place.

⁴⁶ http://en.wikipedia.org/wiki/Vladimir_Ivanovich_Smirnov_%28mathematician%29

Most of the time Smirnov lived in Komarovo, where he met Akhmatova.⁴⁷ Ladyzhenskaya also got to know her, and they developed a very close friendship. Akhmatova even dedicated a poem to Ladyzhenskaya. Olga Alexandrovna has always had a very keen appreciation of literature and art.

She is a unique person. She is a fragile-looking woman, whom I paradoxically used to call the only man in Leningrad.

E.D. Yes, she reminds me of Margaret Thatcher.

A.V. She is a temperamental person. Many people are aware of this, and even the nicest of them do not always get along with her. Yet she is also a person known for her courage and loyalty. For example, consider her stance with regard to politics in scientific community. True, she has her own likes and dislikes, which may have something to do with her research interests. Nevertheless, if she was resolved to support someone, she spared no time and effort doing it. Sometimes, I believe, her efforts were much greater than her protégés deserved. One friend of mine, affiliated with MIAN,⁴⁸ put it really well while talking about one of his colleagues: ‘as a typical Soviet functionary, he would never support anyone or anything if he knew he could not win the case’. Ladyzhenskaya is the exact opposite of that. She often undertakes cases which are clearly hopeless and sometimes is lucky enough to win them.

I for one have had an entirely different relationship with her. She has always been involved in socio-political activities, which I suspect can be attributed to the influence of Smirnov. She was very interested in Samizdat,⁴⁹ at the time when it was extremely dangerous. It is amazing that, in spite of all this,

⁴⁷ One of the most acclaimed Russian poets of the 20th century.
(http://en.wikipedia.org/wiki/Anna_Akhmatova).

⁴⁸ Steklov Institute of Mathematics.
(http://en.wikipedia.org/wiki/Steklov_Institute_of_Mathematics).

⁴⁹ A form of dissident activity in which individuals reproduced censored publications by hand and passed the documents from reader to reader (<http://en.wikipedia.org/wiki/Samizdat>).

she faced no obstacles on her career path. Moreover, she told me that after her defense Vinogradov⁵⁰ started showing her certain support. She worked in MIAN, after making her debut in the department of Physics of the Leningrad University.

E.D. Well, it was important for Vinogradov that she was ethnically Russian.

A.V. Not only that. According to her, she was promoted in opposition to Olga Oleinik,⁵¹ who was backed by Petrovsky.⁵² She said she didn't realize that at first, and this is understandable because she was still very young. She was allowed to attend the International Congress of Mathematicians abroad. There is this famous story about how one night she did not come back to her hotel and thus incurred the anger of the functionary who controlled the Soviet delegation.

Eventually, the conflict between the two Olgas petered out, and she came out without losing her reputation and appreciation of friends and colleagues. She was clearly the 'black sheep' in MIAN, and it is incredible that she managed to retain her position. She attracted the attention of the KGB on account of her friendship with 'wrong' people. For ten years she was not permitted to travel abroad. Her phone was routinely wiretapped. I remember that someone called her to schedule a meeting, and she could hear a voice in the background repeating the address she had dictated. This happened briefly in the mid-70s, when she was associated with Efim Etkind.⁵³ It was a very stressful period of

⁵⁰ As the director of Steklov Institute for an ample 49 years, I. M. Vinogradov implemented enthusiastically the anti-Semitic policy of the Soviet government. See http://en.wikipedia.org/wiki/Ivan_Matveyevich_Vinogradov#Personality_and_career.

⁵¹ http://en.wikipedia.org/wiki/Olga_Arsenievna_Oleinik.

⁵² The relations between the administration of MIAN headed by Vinogradov and the Moscow Mathematical Society representing all Moscow mathematicians were quite strained. Vinogradov enjoyed the support of both academic and communist party leadership. The Moscow Mathematical Society was affiliated with Moscow University and was naturally supported by its rector, Petrovsky. Kolmogorov and Gelfand also commanded considerable amount of influence. As a rule, nominees for the election to the Academy of Sciences and for prestigious state awards proposed by the Moscow Mathematical Society were rejected because of the opposition of MIAN. (See)

⁵³ Russian philologist, linguist, and translator who was persecuted for his dissident activities: (<http://www.larousse.fr/encyclopedie/ehm/Etkind/182551>,

time, which recurred quite recently. Few people know how troublesome Andropov's⁵⁴ ascent to power was. He started to gain political influence during Brezhnev's⁵⁵ term.

E.D. Andropov was considered a liberal.

A.V. Yes, but in reality he cracked down on dissidents; nearly all of them were thrown to jail. Communist functionaries in Leningrad were always excessively zealous to carry out the orders, and in that sense the early 80s were a very difficult time. One time Ladyzhenskaya came to my birthday party, and we talked with apprehension about what the future might hold in store.

Ladyzhenskaya was also a very charitable person. Many people received all kinds of help from her. Maybe it has something to do with the fact that things in her personal life didn't work out quite well.

E.D. I remember that when she invited me to Leningrad a while ago, she was married.

A.V. Her first husband, Kiselev, was a historian of mathematics. Their marriage didn't last long. She loved her nephews, who even lived with her for some time. It seems that she always needed someone, human or animal, to bestow her love upon. She had a wonderful poodle.

E.D. What else do you know about that notorious rivalry between the two Olgas?

A.V. I don't know much about it, but I don't believe there was an actual rivalry. Both worked in the theory of partial differential equations but in different subfields of this theory.

E.D. I heard that they exchanged some hostile remarks. Is that true?

<http://www.jstor.org/stable/309996>).

⁵⁴ General Secretary of the Communist Party in 1982-1984
(http://en.wikipedia.org/wiki/Yuri_Andropov).

⁵⁵ General Secretary of the Communist Party in 1964-1982
(http://en.wikipedia.org/wiki/Leonid_Brezhnev).

A.V. Yes, it is, but I try to stay away from such things. I think it was an instance of female competitiveness. Of course, their mutual dislike was fanned from outside. There were some important people who took sides, but, to tell you the truth, I don't see any real reason for a conflict. I met Olga Oleinik a few times, and, with all due respect to her, she is very different from Ladyzhenskaya in her outlook on things. Careerwise, however, they were pretty similar—just as their respective supervisors, Smirnov and Petrovsky, although the latter was a more powerful figure. But Smirnov also had considerable influence.

I wasn't there to witness the high point of Olgas' rivalry, but I know that Ladyzhenskaya is on good terms with all the best mathematicians in Moscow which can not be said about Oleinik. Ladyzhenskaya is a very flexible person with a somewhat naïve desire to keep abreast of everything in mathematics. She invites other scholars to come and give talks and always tries to find subjects of common interest. For example, she is good friends with Arnold,⁵⁶ Novikov,⁵⁷ and Sinai,⁵⁸ who visited her in Leningrad.

E.D. I also count myself among her friends. In the 1980s we met in Paris.

A.V. There was a time in the mid-60s when the method of stochastic differential equations or rather its success became known to many mathematicians. In the beginning specialists in the theory of differential equations have not acknowledged the value of this method for the theory of differential equations. It is a paradox worthy of discussion by a historian of mathematics that for some time probabilistic methods including stochastic differential equations were for many analysts something mysterious. However this approach proved to be very useful for the study of degenerate linear and quasilinear equations – a direction attracted many researchers including Ladyzhenskaya. She knew about the work of Khasminskii, Freidlin, Wentzel, and yours of course. She invited

⁵⁶ http://en.wikipedia.org/wiki/Vladimir_Arnold.

⁵⁷ http://en.wikipedia.org/wiki/Sergei_Novikov_%28mathematician%29.

⁵⁸ http://en.wikipedia.org/wiki/Yakov_G._Sinai.

probabilists. They were passionately talking about the mathematical expectation of some additive functionals, but the method of stochastic differential equations still eludes most of this generation. She even wanted me to explain the subject from the very beginning, but I did not think that I could succeed in this task.