

## Highlights

**(1) May 22, 1987, Ithaca, New York<sup>1</sup> and (2) July 19, 1987, Ithaca, New York**

### **A. Refuseniks<sup>2</sup> (Interview 1, Part 1 and Part 2)**

E. D. Let us start from the end. Tell me first about the circumstances of your departure from the Soviet Union<sup>3</sup>, and then we will go back further in time. What was the most unexpected moment?

M. F. The most unexpected thing happened on January 22, 1987 when we received a call informing us that our application for an exit visa would never be reviewed again.

E. D. Was it unexpected? If I am not mistaken, you had received similar calls before.

M. F. Yes, we had. Still it was very unnerving to hear that, all the more so because we considered the telephone call of Gorbachev to Sakharov in December 1986<sup>4</sup> as a sign of change, something we now call *perestroika*.

L. F. Moreover we were told that the refusal was final because it was based on the law.

M. F. However, on January 29 we were told that the review was possible and, if we didn't change our minds, then we needed to submit a statement confirming that there was no change in our family status. We submitted it on the following day and were told that our application would most likely be approved. On March 2 we were invited to OVIR.<sup>5</sup> However, in order to obtain our exit visas we also had to submit a formal consent from my sister. New regulations required a notarized formal consent from all close relatives. The next day I

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<sup>1</sup> Recorded at Dynkin's home. Mark, his wife Lera and their children Borya and Yulya came to the US on May 6, 1987 and they were given a ride to Ithaca by Mikhail Brin, Mark's colleague at the University of Maryland.

<sup>2</sup> <http://en.wikipedia.org/wiki/Refusenik>

<sup>3</sup> Freidlins applied for an exit visa from the USSR in 1979 but they received it only in 1987. For eight years, being "refuseniks", they were unemployed. Mark assisted by Lera worked on a monograph "Functional integration and partial differential equations" published in 1985 by Princeton University Press in the series Annals of Mathematics Studies. They supported the family by private tutoring.

<sup>4</sup> Gorbachev invited Sakharov to return to Moscow after six years of exile in Gorky (Nizhny Novgorod).

<sup>5</sup> The department of the Interior Ministry responsible for exit visas.

submitted such a statement.

E. D. Your sister wasn't particularly happy about your decision. Nevertheless she didn't try to prevent you from leaving, right?

M. F. She was very supportive of us in every possible way. Yet the biggest credit goes to my father. Shortly after a stroke that he suffered in 1983 he told me, "Mark, you've been trying to leave the country for a while now, but this seems hopeless. Maybe you should look for a job, even part time." But on the following day he apologized, saying that I made the right decision. Taking into account that he was 84 and that my departure would be a tremendous loss for him, he was a real hero.

E. D. How did other people behave during this period?

M. F. We communicated mostly with our close friends. However I must also acknowledge the help of Armenian mathematicians in solving the problem with higher education of our son Boris. He graduated from high school in 1981. There was no chance for him to be admitted to the Moscow University. However, he became a student in the Department of Mathematics of the Erevan University.

E. D. Did anyone visit you and help you in any way?

M. F. We made a lot of friends among other refuseniks. Among mathematicians our closest friends were Sasha and Louisa Kirillov. I also met with Sasha Wentzell a few times.

L. F. Sasha Wentzell is so shy. He brought me flowers, which is quite unlike him. He looked emotionally agitated...

M. F. ... and sad at the same time.

E. D. You told me that you had a farewell party. Who came to say good-bye?

M. F. A lot of people came: the Kirillovs, the Wentzells, Dobrushin, the Gindikins, Borya Polyak, Alik Yushkevich, and Valya Tutubalin with his wife.

E. D. He didn't come to say good-bye when I was leaving.

M. F. I wasn't in touch with him for eight years. I think he came only because his wife worked with Lera.

L. F. Also, he didn't miss the opportunity to pontificate about how wrong we were in our decision to emigrate.

M. F. There was also Yura Tyurin, who was a close friend during all these years. There were Misha and Masha Zalenko, Minlos, Volodya Pavlov.

E. D. You decided to accept the offer from Maryland just before you left, right?

M. F. Yes, and it was not an easy decision.

L. F. Since we also had offers from Israel, this was a very difficult decision. We didn't sleep for several nights. People were constantly coming to see us and discuss our situation.

M. F. In fact, we had several farewell parties. The one I mentioned was for mathematicians. Prior to that we hosted parties for our relatives and for our refusenik friends.

L. F. In addition we were visited by people who couldn't attend the parties or who only recently learned about our departure.

E.D. Okay, let's go a little bit back in time. Tell me more about that period of your life when you were refuseniks.

M. F. It was something special.

L. F. It changed me a lot ...

M. F. ... for the better.

L. F. Yes.

M. F. We reassessed our values and our attitude toward others.

L. F. We changed completely. If this had not happened to us, we would have lived only one life. Instead we have lived two.

E. D. And now you are about to start a third one. So did you quit your job in the university or did they fire you?

M. F. We had to quit. Otherwise we would not have received the documents required for our exit visa application. None of the refuseniks were successful in keeping their positions at the university. For example, Leonid Dickey who worked in the department of physics did everything he could to stay. He even went to court two or three times. Still he managed to hang on only for a few months. So staying at the university was not an option.

E. D. If you had known how things would turn out, you might have moved from the university to a research institute before applying for emigration.

L. F. At the time we had no reason to fear that our application would be refused.

M. F. Besides, such a move would arouse suspicion, and so I don't think they would have hired me.

E. D. Did KGB put any pressure on you?

M. F. Yes, but not too much. They never told me directly that if I refused to cooperate they would do something to Borya, although I had a couple of conversations where they seemed to insinuate that.

There is one very interesting story. In 1982 Vladimir Mikoyan, a Soviet diplomat in Washington, gave an interview to the *Baltimore Sun* claiming that all Jews who wanted to leave the U.S.S.R. had already done so. We learned about this from the radio and decided to write a letter saying that Mikoyan's statement was false and that, for instance, we wanted to leave the country but were denied to do so. The *Baltimore Sun* published our letter in 1983.

E. D. Obviously you didn't send it by mail.

M. F. Of course not. There were ten of us, mostly scientists, who signed the letter. There was also another letter written by musicians and artists. In about three or four months all of us were summoned for interrogation with regard to the "slandorous" article published in the *Baltimore Sun*. We were summoned as witnesses. According to Soviet law, witnesses were obligated to testify, and they could be persecuted if they refused. So I was shown a copy of the article with my name completely distorted. The investigator asked me what I could say about this slanderous anti-Soviet statement. Prior to that I had requested that all his questions be presented to me in writing and that I respond in writing as well. If I said that I hadn't signed the letter, then a Soviet newspaper could declare that Freidlin had nothing to do with that slander against the Soviet Union. Obviously I didn't want that to happen. But if I said that I had signed it, I would be accused of slander and then who knows what would have happened. So I wrote that the statements of the investigator were false, and that the entire interrogation was a provocation. I also said that I would be willing to provide concrete examples of people who still wanted to leave the country and dismissed because of that from their jobs. The case against me was not dropped, but it was suspended. After that I was the subject of another interrogation, this time in relation to a letter published in *Nature* and to a letter addressed to the president of Israel.

E. D. I heard about the second letter from Freiman.<sup>6</sup>

M. F. He was the one who wrote it.

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<sup>6</sup> His interview is a part of the present collection.

## **B. Mekhmat in 1980s**

### **(Interview 1, Part 2)**

E. D. Now let us talk about the present situation at Moscow University and about our mutual Moscow friends. Let's start with the doctoral dissertation of Sasha Wentzell.

M. F. Sasha decided to submit it several years ago. When he told this to the head of the Probability Chair, Gnedenko<sup>7</sup> said that the dissertation must contain no reference to any works of Freidlin or even to joint publications of Freidlin and Wentzell.

E. D. What an absurdity! How can you write a thesis without referring to the most fundamental works in the field?

M. F. Saddened by the news, Wentzell approached me. I told him that he should comply because there is no point in fighting windmills. So he submitted the thesis without any references to our publications. And this was a very good thesis.

E. D. No doubt, it was a world class contribution to science.

M. F. My impression is that it wasn't Gnedenko's idea.

E. D. That is quite possible.

M. F. Sasha is certainly one of the most distinguished members of the Probability Chair, and yet he has been told that he will not be promoted to the full professorship. He is an associate professor now. It has been suggested to him that he should change his status to a researcher which ranks lower than a professor.

E. D. Who works at the Probability Chair now? The head is still Gnedenko, right?

M. F. Yes. There are a number of strong people there. Some of them - Molchanov, Wentzell, Tutubalin -are your students. Tutubalin has been appointed full professor, although he is not very active in research.

E. D. He has done some nice work but his contributions cannot be compared to that of Wentzell.

M. F. There are two probability Chairs in Mekhmath: one headed by Gnedenko and the other by Rozanov. Rozanov's Chair, called the Chair of Statistics and Random Processes. (It includes a lab headed by Zhurbenko. ) Kolya Krylov is a professor there. Misha Malyutov

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<sup>7</sup> <http://www.gap-system.org/~history/Biographies/Gnedenko.html>

works there as well.

E. D. How is he doing?

M. F. Misha has four children and, as he says, he spends most of his time with his kids.

E. D. What about Shiryaev?

M. F. Shiryaev works at the Chair of Gnedenko. He is not on very good terms with Rozanov. At one point his position came under the purview of Rozanov, and it was unclear if Shiryaev would be able to keep it. But everything worked out well for him in the end.

E. D. But Shiryaev's main job is in the Steklov Institute of Mathematics. What about Rozanov?

M. F. Rozanov works there as well.

E. D. I have learned from Shiryaev that Kolmogorov is now the head of the Logic Chair. But only part time and without salary. Shiryaev said that Kolmogorov was constantly badgered at Mekhmat and that there were some unpleasant incidents during the celebration of his 80<sup>th</sup> birthday. This must be a huge blow to the prestige of the university. After all Kolmogorov has devoted his entire life to Mekhmat.

M. F. In recent years the atmosphere in Mekhmat has been simply intolerable. Arnold left. He was badgered too. My impression is that the current administration of Mekhmat doesn't give a damn about mathematics and the university

E. D. This has always been the case, but people who cared used to have at least some influence. Who is the dean now?

M. F. The dean is Lupanov.<sup>8</sup> He is a logician. As a mathematician he is quite good but as an administrator he is not very independent. He doesn't prevent other people from doing bad things. There is a group of people in Mekhmat who wield all the power. They are absolute zeros as scientists but are very smart politicians, and they promote only those who they think will stay loyal to them.

E. D. This must be a new generation. I used to know such people before. Take Ogibalov for example. Is he alive?

M. F. He is still alive, but he stays out of the way.

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<sup>8</sup> [http://en.wikipedia.org/wiki/Oleg\\_Lupanov](http://en.wikipedia.org/wiki/Oleg_Lupanov)

E. D. He must be about eighty years old I believe. Once he used to be the leader of this group.

M. F. Ogibalov was a master demagogue. I remember how in 1973 he gave a speech at the Scientific Council where he said: "Comrades! We are about to elect new professors for the vacant positions. What is the most important requirement for this position? There is no doubt that the candidates must be top level scientists who will adequately reflect the high standards of our university. However, since we are all top level scientists here, we have to pay particular attention to their political profile."

E. D. There was also Lenskii.

E. D. Gorbunov?

M. F. Gorbunov suffered a stroke and is no longer active. I think he has some mental issues too.

E. D. In a sense it is a true blessing that people are mortal because even if villains wield all the power they have to step down eventually.

M. F. Unfortunately, this applies to good people just as well.

E. D. What about Ulyanov?

M. F. Ulyanov is now making a big effort to be an honest and reasonable person.

E. D. Didn't you tell me that this happened because he realized that his wrongdoings became known in the West?

M. F. That certainly played a role, but he changed quite a lot after he was elected a corresponding member of the Academy of Sciences. He also became the head of Menshov's<sup>9</sup> Chair after Menshov's retirement.

E. D. Is Menshov still alive?

M. F. Yes, he is -- at least as far as I know.

E. D. He must be about hundred years old.

M. F. Ninety-five, I think. As for Ulyanov, at least he tries to give the impression of supporting such good mathematicians as Minlos and Kirillov.

E. D. Things seem to have changed quite a bit because he used to hold fairly strong anti-Semitic views.

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<sup>9</sup> [http://en.wikipedia.org/wiki/Dmitrii\\_Evgenevich\\_Menshov](http://en.wikipedia.org/wiki/Dmitrii_Evgenevich_Menshov)

M. F. When Gelfand was elected a member of the Academy of Sciences, the administration of Mekhmash did not congratulate him. But Ulyanov had a big poster displayed on the wall across from his office with the words: "We are happy to congratulate Izrail Moiseevich on his election to the Academy of Sciences."

E. D. Where else would I learn all this news if not from you. So how is my good old friend, Olga Arsenyevna Oleinik?

M. F. To be honest, in the past eight years I haven't talked to her at all.

E. D. Hardly surprising, but I would assume it was she who tried to avoid you.

M. F. True, but I wasn't too eager to meet her either. I have heard from other people that the situation at her Chair is pretty bad. On the one hand, she is on bad terms with Arnold. On the other hand, they have Kruzhkov who is on bad terms with everyone, even with Gusarova, who used to be his best friend.

### **C. The Book "Functional Integration and PDEs"**

#### **(Interview 1, Part 2, 30:00-40:30)**

M. F. After our application for an exit visa had been refused, we had to find some way to make a living and not to waste time. And so I came to the conclusion that I should write a book, especially because I accumulated a number of unpublished results.

Of course, publishing in the Soviet Union was out of question. So I contacted you to explore a possibility to publish in the West. To my surprise you responded that this will not be a problem. So I started to work on the book and Lera decided to help with its translation into English. Her command of the language was insufficient for this task, and she undertook enormous efforts to improve her skill. She studied grammar, read textbooks and research articles. She had several notebooks filled with phrases and expressions commonly used in mathematical texts. She started translating six months later, when I finished my first chapter.

We also found a very stringent critic in the person of Sasha Wentzell, who would often criticize Lera on the grounds that certain expressions are not used in mathematics. Lera was afraid of him. Once she took his class and got a B. You know, Sasha cuts a very intimidating figure on his exams, and I think Lera is still a little bit afraid of him.

E. D. I think it's usually the case with Wentzell's students that they like him and fear



him at the same time.

M. F. Sasha is a very nice and kind person, but he has a difficulty in showing his kindness.

E. D. I was never afraid of him but every time I happened to make an erroneous statement he would immediately produce a counterexample.

M. F. I must say that this quality also hinders him. He can discern the difficulties of a particular mathematical problem before he starts working on it and therefore he often never starts. I witnessed that a number of times because we often worked together. Usually I would come up with a certain result or even a tentative proof, and Sasha would immediately detect errors.

E. D. Well, there are different kinds of errors. Some are fundamental, others can be easily corrected.

M. F. My collaboration with him goes back to your seminar, where I gave a talk on the Dirichlet problem for elliptic equations with a small parameter and related diffusion processes. There was a gap in my proof, and I mentioned that in my talk. In two days Sasha asked me if I knew how to prove it. I said no, and he said that he knew. From that moment on we started working together. Our collaboration continued for a long time, and we both have benefited from it.

L. F. Sasha is the kind of person who derives particular pleasure in finding errors. He has a unique gift of spotting them, and every time he finds one he beams with happiness. Nevertheless he was extremely considerate toward me.

M. F. We used to give sections of translated text to our friends. I was mostly interested in their feedback on issues of mathematics, whereas Lera was mostly interested in linguistic feedback. Sasha Wentzell was the only person who could provide both.

E. D. Did you show the manuscript to foreign guests?

M. F. It wasn't possible because they usually stayed only for a couple of days.

E. D. Yes, it's a long book. I remember that Jerzy Neyman<sup>10</sup> visiting in Moscow gladly helped me to translate a certain mathematical statement. So maybe you should have asked only a few specific questions.

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<sup>10</sup> [http://en.wikipedia.org/wiki/Jerzy\\_Neyman](http://en.wikipedia.org/wiki/Jerzy_Neyman)

M. F. In fact we did but we didn't always receive correct answers.

L. F. Most people we asked were not mathematicians.

M. F. Even when they were, our questions were not such that one could answer them on the spot.

E. D. Was publishing a book abroad considered illegal?

M. F. There is no Soviet law explicitly prohibiting it. One could be subject to administrative penalties at work. But since I didn't have a job, it wouldn't apply in my case. However, there is a law that prohibits receiving money for publication abroad.

E. D. Did you take precautions to safeguard the manuscript?

L. F. Yes. There was a very critical moment when one of Borya's classmates, a dissident was arrested. The same evening the KGB conducted searches in the apartments of his classmates. Fortunately, they did not come to our apartment, maybe, they knew that Borya was in Yerevan. But when I learned about the searches I gave one copy of the manuscript to our friends.

E. D. In other words, it was the same story as with Solzhenitsyn's *The Gulag Archipelago*.

L. F. Yes, it was a horrible situation. I was so afraid that we were going to lose the manuscript. It would have been a terrible blow to us.

M. F. We were very happy when we received our contract from the Princeton University Press. It was delivered secretly by a foreign mathematician who was hiding it on her body. For obvious reasons my name didn't appear on the document.

E. D. And you sent me the power of attorney letter through her, right?

M. F. Not through her, but via another foreign visitor.

E. D. Even a publisher sympathetic with your situation still needed a legal document.

M. F. I perfectly understand that. By the way, I sent only a blank sheet of paper with my signature on it. The text was inserted by my colleagues in the U.S. The manuscript of the book (without the title page and the name of the author) was smuggled to the West by a foreign colleague.

## D. Life in Mathematics

### (Interview 1, Part 3. Interview 2, Part1 and Part 2)

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

M. F. As a child I lived in close proximity of the Moscow University and the Lenin Library. The first book on mathematics that drew my attention was the *Selected problems and Theorems of Elementary Mathematics* by Shklyarskii and others. I looked through a few problems in this book and decided to join the math circle at the University run by Sasha Krylov and Kolya Bakhvalov.<sup>11</sup> I attended it from the seventh to the tenth grade, and I liked it a lot.

E. D. Math circles provide a wonderful experience for students and instructors alike.

M. F. The early 50s was the time when math circles flourished. They were founded on pure enthusiasm, without any outside pressure (in contrast to the situation in Moscow today). Among the members of our circle were Kirillov, Arnold, Tutubalin and Vinberg. My school years were closely entwined with the activity of that circle. From time to time I also attended another circle run by Arkady Onischick and Nikita Vvedenskaya.

E. D. What Sasha Krylov is doing now?

M. F. He defended his Doctor of Science dissertation and works in the Institute of the Earth Physics.

E. D. What about your achievements in the mathematical Olympiads?

M. F. I enjoyed taking part in them and often won prizes, although never the highest one.

E. D. What was the highest prize you got?

M. F. I won the second prize a few times. I never won the first prize. The first prize, as a rule, went to Kirillov. I think Arnold also never received the first prize.

E. D. Did you have any problems getting into the university?

M. F. No. The year I took my entrance exams was a good year. I took seven exams.

E. D. This is because you didn't graduate from high school with a medal, right?

M. F. Yes, I didn't have one, but I scored 35 points out of 35 in the exams.

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<sup>11</sup> [http://en.wikipedia.org/wiki/Nikolai\\_Sergeevich\\_Bakhvalov](http://en.wikipedia.org/wiki/Nikolai_Sergeevich_Bakhvalov)

E. D. In other words, you scored 5 points in each exam.<sup>12</sup>

M. F. Correct. There was, however, a funny situation when I came to campus to verify that my name was on the list of admitted students. I was pretty confident that I got in because few people score 35. Surprisingly, my name was not on the list. The omission proved to be a simple mistake. So I was admitted to Mekhmath without any problems. That year the Chair of the admissions committee was Pavel Sergeyevich Alexandrov.<sup>13</sup>

E. D. It's very unlikely that he discriminated **against** the examinees.

M. F. Quite the opposite. When I was taking my oral exam in Russian language and literature, he entered the examination room and asked the examiners not to be too harsh to those who got 5 in mathematics since there were very few people who scored 5 points in mathematics. I scored 5 points in Russian language and literature as well. This is how I got into Mekhmath.

E. D. So one could say the beginning of your career was unclouded.

M. F. I guess so. One could say that most of my career was relatively unclouded.

E. D. What did you do in your first and second year of university?

M. F. Somewhere toward the end of my first year I joined your seminar. Most top students from our class, including Kirillov, Arnold, Vinberg, were in it as well. Sometimes the atmosphere was quite challenging. You would call a random student to the blackboard and ask him to solve a problem. I remember that one time you called on a student, and, when he couldn't provide an answer to your question, you referred to ~~a~~ Pavlov's experiment with an ape that was challenged to fetch a banana by connecting two sticks.

E. D. Yes, I wrote two statements on the blackboard and asked a student to combine them in order to obtain a stated result.

M. F. In your seminar I started to work on a term paper.

E. D. What was it about?

M. F. It was about the relation between Lie groups and Lie algebras.

E. D. In my opinion every research mathematician should be familiar with this relation.

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<sup>12</sup> 5 points = A.

<sup>13</sup> [http://en.wikipedia.org/wiki/Pavel\\_Alexandrov](http://en.wikipedia.org/wiki/Pavel_Alexandrov)

M. F. I agree. So I proved that the logarithm maps a neighborhood of the identity in a group to a Lie algebra. This was my term paper in the second year. Arkady Onischik served as my reviewer. In the third year I was writing a term paper on invariant measures on symmetric spaces. I found these problems difficult. I put a lot of effort into this calculation only to discover that this was already done by Cartan.<sup>14</sup> I was very upset.<sup>15</sup> If only I had known, I would have simply consulted his work. I had put a lot of effort into this problem. This was partly the reason why in my fourth year my interests veered toward the theory of probability.

E. D. Was it around 1954 or 55?

M. F. Yes, 1955 or 56.

E. D. Well, in 1955-56 I already began a series of works on Markov's processes.

M. F. In my fourth year, you left for China and you asked Girsanov<sup>16</sup> to be my adviser until you are back. I wrote a term paper on stochastic equations.

E. D. It must have been an important landmark in your career.

M. F. It was my first published paper. Later I incorporated parts of it into my diploma project.

E. D. Girsanov was a brilliant mathematician.

M. F. He also was a very nice person. We were more like friends than a teacher and a student.

E. D. Did you also work on diffusion processes with reflection?

M. F. Yes, I worked on processes with reflection at the beginning of my graduate studies. Later I wrote a dissertation on equations with small parameters. Then I stopped working on them for a while.

E. D. But later you returned to them.

M. F. Yes, and I have been working on them ever since.

E. D. What do you remember about your student years. It doesn't have to be related to my seminar.

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<sup>14</sup> [en.wikipedia.org/wiki/Élie\\_Cartan](http://en.wikipedia.org/wiki/Élie_Cartan)

<sup>15</sup> Note of E. D. I believe that it is beneficial for a student to get by himself an important formula or a theorem even if it can be found in the literature. This pedagogical method was used regularly by A. Kronrod in teaching motivated students.

<sup>16</sup> [http://en.wikipedia.org/wiki/Igor\\_Vladimirovich\\_Girsanov](http://en.wikipedia.org/wiki/Igor_Vladimirovich_Girsanov)

M. F. There were a lot of talented students in our class. Many of them were former participants of math circles, people like Arnold and Kirillov.

E. D. For a while Arnold and Kirillov used to have fairly similar research interests.

M. F. Yes, what happened is this. Aside from your seminar there was also Vitushkin's seminar on the theory of function of a real variable, and in that seminar Arnold developed a keen interest in Hilbert's thirteenth problem. Vitushkin argued that not every continuous function of three variables can be represented as a superposition of continuous functions of two variables. Arnold claimed the opposite. I remember how at Vitushkin's birthday party each one vowed to prove his argument.

E. D. And who prevailed?

M. F. In a sense both of them did.<sup>17</sup>

E. D. Which one of your early papers was the most significant one in terms of personal validation as a scholar?

M. F. Like many young people, I went through a period when I had doubts as to whether I can become a good mathematician. In 1963 I wrote a paper on a priori bounds for degenerated elliptic equations, and since **after that** became more calm and confident. I was at the end of my graduate study.

E. D. Did you participate in the seminar on probability theory together with Skorokhod?

M. F. No, it took place before my time. Girsanov, Seregin, Yushkevich, and Khasminskii were some of the older people who participated in it.

E. D. For some time I taught a joint seminar with Dobrushin.

M. F. This was also before my time. Dobrushin lectured on random processes. The subject was taught by Kolmogorov in the first semester, but his lectures were too hard for us, and Dobrushin had to start all over again in the second semester. He was a very good lecturer. It was a difficult subject to teach. There were no textbooks on random processes at the time. Doob's book had just been published but it was not an easy read.

E. D. Then you defended your dissertation and were very lucky to stay in the department.

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<sup>17</sup> Arnold was right. See [http://en.wikipedia.org/wiki/Hilbert's\\_thirteenth\\_problem](http://en.wikipedia.org/wiki/Hilbert's_thirteenth_problem)

M. F. Yes, my career is exceptional in this way.

E. D. Not unique but quite unusual—let's put it this way. Since 1945 there were very few cases when a Jewish student has been hired by Mekhmat after defending his Ph. D. thesis.

M. F. A number of students in our class became good mathematicians: Kirillov, Arnold, Tutubalin, Shur, Vinberg. We were good friends, we celebrated holidays together. Most of us stayed in MSU as PhD students, and about eight were hired as Mekhmatah faculty.

E. D. What about your teachers? Who had the most influence on you? Who were your first and second year teachers.

M. F. In my first year I took your algebra course and I must say you were a good lecturer. Analysis was taught by Tumarkin. He was a meticulous teacher but a bit boring.

E. D. I took classes with Tumarkin and Gelfand, and I was more impressed with Gelfand. I also took a class with Delone, a rather interesting character.

M. F. Delone taught a course in geometry, but I wasn't in his section. I was in Alexandrov's section.

E. D. Did you like Alexandrov as a teacher?

M. F. Not so much as a teacher but as a person. He taught analytical geometry which even then seemed a very strange field of mathematics. In class he wasn't concerned only with mathematics but expressed his views on all kinds of subjects.

We took a lot of classes with you. You taught required courses on algebra and probability theory. Olga Arsenyevna Oleinik taught partial differential equations and Pontryagin taught ordinary differential equations.

E. D. What were they like as teachers? Did they show interest in their students?

M. F. I don't recollect anything from Oleinik's lectures. Later I became interested in PDE. But my interest was not related to her lectures. Yet I do remember Arlen Il'in, who taught exercises for her course. He is a very good mathematician, although he probably did not live up to his full potential.

E. D. Olga Arsenyevna on the other hand made a good career, even though she did not achieve what she wanted: she is neither a member of the Academy nor a correspondent member.

M. F. She published a few solid works but ...

E. D. And then of course the tragedy of her life is her perennial rivalry with Olga Alexandrovna Ladyzhenskaya.

M. F. I always liked Olga Alexandrovna. This has more to do with her personality than with **her** research. I always enjoyed talking to her about mathematics. When I was close to defending my doctoral dissertation, she invited me to Leningrad to give a talk at her seminar. Actually, it was Smirnov's seminar, but at the time she already **taken** it over.

E. D. Ladyzhenskaya was a protégé of Smirnov, whereas Oleinik was a protégé of Petrovsky.

M. F. Smirnov was in attendance and considered it his duty to entertain the speakers during the break (a tradition which does not exist in Moscow; they know how to treat their guests). **So** Smirnov didn't find anything better than to tell me anecdotes about Kolmogorov.

E. D. Disrespectful ones, I presume.

M. F. Yes. Ladyzhenskaya suggested that I defend my dissertation in Leningrad. I was inclined to do that because the situation in Moscow was becoming intolerable. Eskin didn't pass his dissertation defense. Kolmogorov happened to be in Leningrad at the same time, and I told him that Ladyzhenskaya thought that I should defend in Leningrad and that she offered to be my opponent. Kolmogorov responded: 'Why do you need to associate with this extravagant woman?' So I had to follow Kolmogorov's advice and defended at Moscow University. My opponents were Skorokhod, Khasminskii and Oleinik.

E. D. Kolmogorov was always very protective of you.

M. F. I always felt his support. Even when I was transferring to the Chair of Biophysics, Kolmogorov invited me to his office and said that he was unable to help me to get a position of a professor at Mekhmath. When I decided to move to Biophysics, his letter to the rector was a key factor. Yes, Kolmogorov played an important role in all critical moments of my career.

I worked on various mathematical models in collaboration with biophysicists, but it never occurred to me that I could work at the Chair of Biophysics. However the situation in Mekhmath became repugnant. In 1977 the head of the Biophysics Chair Andrei Rubin<sup>18</sup>

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<sup>18</sup> <http://www.biophys.msu.ru/personal/rubin/cv.htm>



offered me a position there and everything worked out well. My transfer was the last document signed by the rector Khokhlov. On the following day Khokhlov went to the mountains and died there.

E. D. People say he was an honest man.

M. F. Not only was he honest, but he **had** done a lot of good deeds.

E. D. You cannot say that about his successor, Logunov.

M. F. Logunov is not a good match for the university. In fact, he is not interested in it at all, at least not so far as research and instruction is concerned. He **issues** a lot of pointless administrative regulations. In general opinion he is not doing a good job .

E. D. What do you remember about Iszrail Moiseevich Gelfand?

M. F. Our paths crossed only once, when I wanted to submit a paper to **the** *Functional Analysis*.

E. D. Victor Kac told me that Gelfand refused to write a recommendation letter for him. He said that it would be unfair to give Victor an advantage over young American scholars who were as good as him and whose only shortcoming was that Gelfand didn't know them.

M. F. Sounds quite absurd. In my case everything went well. My paper was published in the first volume of the journal. I think it was 1966. I brought my paper to Agranovich who was the scientific secretary of the editorial board. He rejected it saying that the journal maintains a very high **standards** of papers, even though he didn't know me **or have** any clue as to what my article was about. So I went to Gelfand. Gelfand asked what my article was about. I said it was about quasilinear parabolic equations. He sent it for review, and it was eventually published.

I had a much worse experience with the *Matematicheskie Zametki*,<sup>19</sup> whose chief editor was Stechkin.<sup>20</sup> He rejected an article on the grounds that in it I noted that a certain statement could also be proved under different conditions. I was told that the journal publishes only complete proofs of mathematical statements. So I went to their office and said that I can simply cross out this remark. Stechkin, who happened to be there, said, "How come all of you are so good in finding loopholes!" He handed back my paper. I **ended** up

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<sup>19</sup> *Mathematical Notes*.

<sup>20</sup> [http://en.wikipedia.org/wiki/Sergey\\_Stechkin](http://en.wikipedia.org/wiki/Sergey_Stechkin)

publishing it in the *Probability Theory* I believe. Also, after I applied for an exit visa, all of my papers that were already in the process of publication were returned under various pretexts. One article for example was rejected supposedly because it contained a statement that was not proven. I also submitted a couple of notes to the *Doklady*. When they weren't published in due time, I called Prokhorov,<sup>21</sup> who was a member of the editorial board. He promised me to fix the problem, and indeed they appeared in the next issue.

E. D. Tell me about your relationship with other mathematicians.

M. F. I had a somewhat awkward encounter with Yuri Vladimirovich Linnik. Shortly before his death he was working on a certain statistical problem. He came to Moscow and invited me to his hotel, saying that he had a problem that he thought I could solve. At the time I was very keen on the subject of large deviations. So when he presented his problem, I started talking about a problem that I was interested in. He took offence at this.

E. D. And that was the end of it?

M. F. More or less so. Kolmogorov has left a rather different impression on me. He always had something interesting to say on subjects I was interested in, while Linnik liked to talk only about his own research.

E. D. What do you know about Vinberg?

M. F. Not a lot. I know that he successfully defended his doctoral dissertation.

E. D. Was it on the same subject he had been working on?

M. F. Yes, it was on the same subject or almost on the same subject. He made ~~a~~ good progress, and various people tried to help him, but the opportunity to defend presented itself only recently. Recently, there were several defenses of doctoral dissertations which should have taken place earlier. Senya Gindikin defended his dissertation, and Fuchs defended too.

E. D. So there is a certain progress.

M. F. Both are excellent mathematicians, and it is outrageous that they could not get their degrees earlier. Even when they finally defended, they could not do it in Moscow. Gindikin defended in Tbilisi. Fuchs defended somewhere far from Moscow as well.

E. D. How is our "good friend" Pontryagin? Is he still active in his fight with

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<sup>21</sup> [http://en.wikipedia.org/wiki/Yuri\\_Vasilevich\\_Prokhorov](http://en.wikipedia.org/wiki/Yuri_Vasilevich_Prokhorov)

“Zionists”?

M. F. I haven’t heard much about him for a long time. Now there is a new generation of “anti-Zionists”. I am not sure if Vladimirov<sup>22</sup> qualifies as younger generation but he is very active now too.

E. D. Is he also as virulent as he used to be?

M. F. Rumor has it that he tries to be more moderate to have a better chance of becoming the director of the Steklov Institute.

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<sup>22</sup> [http://en.wikipedia.org/wiki/Vasilii\\_Sergeevich\\_Vladimirov](http://en.wikipedia.org/wiki/Vasilii_Sergeevich_Vladimirov)