

**Akiva M. Yaglom,  
Ithaca, New York, December 2, 1988.**

**Part 1**

E. D. Today is December 2, 1988, and Akiva Moiseevich Yaglom, who I have known for over fifty years, unexpectedly happened to come for a visit.

Kika, please tell about your life, starting from the earliest age possible. When did you actually realize that Stalin is not a very nice person?

Akiva Moiseevich Yaglom: Very early, I think. However, what does early mean? “Early” means that in 1937 I probably already understood everything. And for a long time I was surprised, as to why adults didn’t understand, and I did.

E.D.: How old were you then?

A.Y.: In any case, I’d say, I understood everything fairly well at fifteen.

E.D.: A talented boy.

A.Y.: I even thought that I am not the talented one, but the grown-up men are pretending, that it is to more advantage for them to not understand. I think my father played a big role. He never discussed politics with me. Later on I even asked him “why?” and he said that in his opinion, everyone should understand it himself. But he taught me everything in the world, all different subjects: math, physics, chemistry, which was his specialty.

E.D.: What was his profession?

A.Y.: He was an engineer. After graduation from the polytechnic institute with a degree in chemistry, he was supposed to stay for graduate school to work on a Ph.D. But at the last possible moment he was offered to get baptized. He was an atheist, but he entirely refused getting baptized, saying that it is a betrayal of his people, and that he will never do that.

E.D.: Was that in Moscow?

A.Y.: That was in St. Petersburg. After that he was sent to a factory. That was in 1913, and the war started in 1914. The factory, where he was working, got evacuated. After that, for nearly the rest of his life, he worked in institutions, ministries. In 1920s he worked in Yugostal. That was a trust in Kharkov, run by Tevosian. Later Tevosian brought him along to Moscow.<sup>1</sup> For a long time father was in a close relationship with Tevosian. Tevosian considered him his worker. However, the relationship cooled down when Tevosian moved on to using familiar terms, and father decided that there was no other way, and also started using familiar terms. After that Tevosian immediately went back to the official terms, and cooled down toward him considerably. After some time they parted. Although later, when Tevosian became the narkom of the ferrous metallurgy, father worked in that narkomat.

E.D.: Did Tevosian die a natural death?

A.Y.: Tevosian died a natural death, while an ambassador in Japan, which is reflected in a novel by Bek “The New Appointment.” This novel, originally published abroad, I read with great pleasure when it was published in USSR. Father considered Tevosian a very talented

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<sup>1</sup> Tevosyan Ivan Fedorovich (1902-1958) played a big part in building up Russia’s heavy industry in the post-war years. In 1940-1948 and in 1950-1953 he was People’s Commissar (Minister) of Ferrous Metallurgy.

engineer, very smart, but absolutely dishonest and cynical. Father said that twice Tevosian took him to a meeting with Ordzhonikidze<sup>2</sup>. And he was astonished that Tevosian lied fantastically to Ordzhonikidze's face. Father believed that Ordzhonikidze did not understand anything in metallurgy. He wasn't a bad person, but he was a paramedic by training, so what could be expected from him? He was a comparatively decent person, stood up for his people, tried to provide them with good living conditions. But he did not understand anything in machinery, and Tevosian would tell him such wild things, that it was obvious for any educated person. And father was disgusted that in the meantime he would wink at him: "Look, this is the way to do it!" Why did he lie? He was a great professional to press for a small plan. To decrease the plan, he would argue that some systems are not working, while they would be working well. And then he would heroically over achieve this plan, and get awarded. Father's stories do not exactly match up with the descriptions of the character in the novel by Bek: Bek's main character in not as openly cynical.

E.D.: I haven't read this book. Is it a worthwhile read?

A.Y.: It is. This novel is about the life of the upper class. For example, it describes how the main character accidentally got tardy along with someone from his entourage, and the car left, so he goes through Moscow. And it turns out that he doesn't know how much the ticket in the metro is, and he asks how much is it to get to a certain station, not understanding that the ticket price is fixed to get to any station. He has no idea what streets to take to get to his destination.

E.D.: But let's get back to you.

A.Y.: My father covered all subjects with me, and for many years my favorite subject was history. However, when I was once filling out some form, stating that history is my favorite subject, I already knew for a fact that I will not continue working in this field, because it is impossible in our country where everything is a lie. And the fact that I understood all that in 7<sup>th</sup> grade reflects the influence of my father. Although he would not speak directly, he would tell me about French revolution instead of ours. But, say, in the 9<sup>th</sup> grade, in 1937, while understanding everything that happens around, I still was very worried about the Republicans in Spain. That was a kind of romantic craze. Later I was meeting people who then wondered in fear, what would happen there if Republicans won – they would have what we have. And maybe they were somewhat right.

E.D.: Maybe Franko was not the worst scenario.

A.Y.: I think that the Spanish got lucky. First, Spain was not involved in the war: Franko was considered Hitler and Mussolini's puppet, but he refused to partake in the war.

E.D.: He did send the Blue division.

A.Y.: But they were volunteers, and they were not actively involved in battles. On the other hand, how quickly Spain went to democracy after the death of Franco...

There was no anti-Semitism in our country before the war, I can bet my money on that. Well, maybe some latent form of it existed, but...

E.D.: By the way, in fourth grade my classmate, a Russian boy, advised me: "Just don't tell anyone that you are Jewish!"

A.Y.: I didn't have that. There was no difference for us, who is Jewish and who is not.

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<sup>2</sup> G. K. Ordzhonikidze (1886 – 1937) was one of leaders of the Communist Party of the Soviet Union. See ([http://en.wikipedia.org/wiki/Grigoriy\\_Ordzhonikidze#Politburo\\_member.](http://en.wikipedia.org/wiki/Grigoriy_Ordzhonikidze#Politburo_member.))

E.D.: In my Leningrad school there was also no difference, but in Moscow, in a proletarian district, there was.<sup>3</sup>

A.Y.: I can say something else. Until seventh grade I was in an absolutely terrifying school near our house. Two or three of my classmates were shot for gangsterism a year after we graduated from the seventh grade. They were a little older than us, and they belonged to a rather big criminal group. I, personally, had a great relationship with all those bandits because I would prompt them during class. There was no anti-Semitism; they were all friendly to me and my brother. So I was very surprised when my father was insisting that we go to a technical school. I would ask him why, and he would say that while there is no anti-Semitism now, it may always appear, and that would not be a problem for an engineer, but it would for a school teacher.

E.D.: Do you know that when I wanted to become a mathematician, my mother would say: “Go to medical school; it may be useful at camp.”

A.Y.: Well, this is a magnified version of what my father would tell me. And he persuaded us to go to an open house to a few technical universities. Since we promised our father, we visited the open houses, even though we weren’t going to study there.

E.D.: And when did you decide to become a mathematician and deviate from politics?

A.Y.: Probably sometime in ninth grade. Beginning in eighth grade we started going to math circles<sup>4</sup>. In eighth grade we went to a math circle at the Pedagogical Institute. It was led by Ivan Kuzmich Andronov.

E.D.: It seems he was a rather decent person, while a null at mathematics.

A.Y.: Yes, a null mathematician. But he was a wonderful lecturer. The rumor goes that it wasn’t always correct (then we didn’t notice it), but it was very engaging. And we would go to the circle with great pleasure.

I always considered father an amazing person, he knew a lot. Back during the war he was a member of the editorial board of a practically Bolshevik newspaper. Well, the newspaper was not Bolshevik, but it was associated with the left wing of Bund.<sup>5</sup> Father would write reviews of the international situation for this newspaper. He was very Left, during the election for the fourth (the last one) Gosduma he voted for Bolsheviks. But he would say that God saved him: he did not join the Bolshevik party when he found out that in 1918 by Lenin’s personal order some Mensheviks and SR’s<sup>6</sup>, who didn’t yet return from the Tsar’s exile, were simply left there. It was too much for him: he could not join the party that would leave people, imprisoned for their fight against the Tsar regime, the same place they were even after the opponents of the Tsar regime won.

Nevertheless, his brother joined the party in 1918, and made a career. He was close to Tomskii<sup>7</sup>. We came to Moscow in 1926, when he was the editor of the “Trud” newspaper. Approximately in 1926 or 1927 “Pravda” was criticizing him a lot. It was an implicit attack at

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<sup>3</sup> [Note by E. D.] At the beginning of 1935 my parents were exiled from Leningrad to Kazakhstan and they sent me to Moscow where I stayed with my mother’s sister’s family till the end of the academic year.

<sup>4</sup> Mathematical circles [“kruzhki”] for gifted high school students were run at Moscow State University by the University students. At some other institutions they were led by professors. This system is quite different from any form of work with motivated high school students in the USA.

<sup>5</sup> The Bund or the Jewish Labor Bund, was a secular Jewish socialist party in the Russian Empire. See [http://en.wikipedia.org/wiki/The\\_Bund](http://en.wikipedia.org/wiki/The_Bund).

<sup>6</sup> The Party of Socialists-Revolutionaries (PSR, the SRs, or Esers) was a major political party in early 20th century Russia and a key player in the Russian Revolution. See [http://en.wikipedia.org/wiki/Socialist-Revolutionary\\_Party](http://en.wikipedia.org/wiki/Socialist-Revolutionary_Party).

<sup>7</sup> M. P. Tomskii (1880-1936) ( member of the Politburo in 1922-30) was also the head of the USSR Council of Trade Unions. In a situation of mass repressions he committed suicide.

Tomskii but, at that time it was fine to criticize Yaglom but not yet to criticize Tomskii. My uncle was removed from his editorial position, and was sent to Novosibirsk as the chairman of the Siberian trade unions' council. Then Eikhe came to Novosibirsk as the first secretary, and started a bloody massacre, destroying everyone, who had any connections to the left or the right opposition. My uncle was saved by Mikoyan, who had known him for very long. He went to Siberia, took my uncle to Moscow, and made him his deputy. At that time Mikoyan was the Narkomsnab (People's Commissar for Supply). There were probably about eight People's Commissars at that time. And Mikoyan was responsible for foreign and domestic trade, light industry, and something else. He was a survivor. There was a joke "From Ilyich to Ilyich he is without heart attack or paralysis<sup>8</sup>." But he saved my uncle. However, in 1938 my uncle was imprisoned, and he was sentenced to 10 years without the right of correspondence.

E.D.: My father, who had never been involved in any politics, got the same sentence. They were probably shot at once.

A.Y.: 10 years without the right of correspondence - now we know that it meant to be shot, but we didn't know it then. So for many years out of naiveté I was expecting him to come back and tell me something about the history of the party. He was close to Bukharin. And in our childhood my brother and I would wear suits, made out of the fabric that Bukharin had brought from Germany and gave as a present to my uncle, who later gave it to my father. Now I am able to talk about these crimes!

E.D.: Pants sounds even better. "We used to wear pants made of the material presented to us by Bukharin."

A.Y.: In my lifetime I have met several people who used to know my uncle and loved him. Here is a story worth telling. It was before the war, during my second or third year at the University. I was being examined in the political economics by some person, who asked me: "Is Yaglom of the Unions your father?.."

(For whatever reason, everyone who knew him would call him "the Trade Union Yaglom." It was likely because he had worked in the Unions under Tomskii. By the way, for the construction of what is called now "the Mikoyan kombinat" he received the Order of the Labor Red Banner. At that time there were few of those given out. He was shot shortly after that.)

So this professor asked me: "Is the Trade Union Yaglom your father?" I said: "Uncle." And the professor asked: "And where is he now?" I said: "He is absent." "Ah, yes, of course. Well, give me your examination book." And he added: "He used to be a good person," and gave me an excellent grade without any questions. That was a brave move. To give an excellent grade without ever asking was a kind of political act, a clear expression of condolences. Entirely unexpected.

My father lived well to be sixty. He would always say that he is younger than Stalin. Nevertheless, he died before Stalin.

E.D.: Maybe we should move on to mathematics now?

A.Y.: In order to get me and my brother interested in math, my father started solving competition-level math problems for school teachers from the "Mathematics at School" magazine. While being a common engineer, he received the first prize two years in a row. As a youth, he left the family because he wanted to study, and nobody in his family studied. Because of discrimination of Jews in Russia, he hitchhiked first to Germany, and then to Belgium. In Belgium he attended a Polytechnic Institute, while earning his living by giving lessons in

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<sup>8</sup>"From Vladimir Ilyich Lenin to Leonid Ilyich Brezhnev...."

mathematics and Hebrew .(He graduated from a cheder<sup>9</sup>, so, naturally, he knew Hebrew.) Then he moved from Belgium to the Warsaw Polytechnic Institute, and when one opened in Petersburg, he moved to Petersburg. In 1919 he graduated from Petersburg Polytechnic Institute. This is how he got us interested in math. Later my brother and I would solve those kinds of problems ourselves.

I entered the Moscow State University in 1938, and before that we were first involved with the school math circle at the pedagogical institute, and later, starting in ninth grade, moved on to the school mathematical circle at MSU. The style was very different. Formerly we used to have only lectures by Ivan Kuzmich Andronov, and here Schnirelmann, Pontryagin, Kolmogorov gave lectures every Sunday. Schnirelmann was the best out of the three in giving lectures to the high school students. Kolmogorov was difficult to understand.

E.D.: It is part of history, isn't it?

A.Y.: It is also historical how my brother and I lured one of our peers to the circle at MSU. The school near our house had no eighth grade, and everyone who wanted to continue the education went to the neighboring schools. We went to the 114<sup>th</sup> school, and our classmate Tolya went to the 113<sup>th</sup> school. And a little later he told us that there is a very strong mathematician in his class, who is as good as we are at solving math problems. His name was Andrei Sakharov. We rebelled: who could be better than us at solving math problems? So we went to meet Andrei Sakharov. My brother and I liked the guy, and we dragged him to the high school math circle at MSU. And in ninth grade (that means, in the academic year 36-37) we would attend, together with him, the school math circle run by Shklyarskii.

E.D.: Can you talk about Shklyarskii? He deserves it.<sup>10</sup>

A.Y.: Shklyarskii created his own style. In class he would himself tell us something. We thought that he was improvising, but later, to our amazement, we found out that he would always go through extensive preparations.

E.D.: Just as we all later on would go through extensive preparations.

A.Y.: Yes, yes. Of even greater importance was the work on homework problems. And the next time we would get up and talk about our solutions. Andrei Sakharov, although a strong mathematician, turned out to be unfit for this style. He would frequently solve the problem, but wouldn't be able to explain how he arrived at the solution. The solution was correct, but his explanation would be too sophisticated to understand him. He had remarkable intuition, and somehow he understood what should be the final outcome, but he frequently could not explain why it came out to be that way. However, in atomic physics, that he got involved with later, it turned out to be just the right thing. At that time there were no strict formulas in that field, and mathematical software was not helpful, but intuition was of utter importance.

And Shklyarskii was a very engaging lecturer. Furthermore, he would go on walks with us, and would try to work on our proper upbringing then. He was a lot more Soviet than my brother and I was. For example, he tried to tell us what a great poet Mayakovski is, and we would naturally disagree, and would exhibit a very low intellectual level because we liked Bryusov. Now I understand that Bryusov is a significantly worse poet than Mayakovski, but then we didn't understand that.

Shklyarskii would also read to us works by classic poets – Pushkin, for example.

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<sup>9</sup> The Religious Jewish elementary school. See <http://en.wikipedia.org/wiki/Heder>. (Transliteration “cheder” is of Judeo-German origin. An English counterpart is “kheder”.)

<sup>10</sup> David Oskarovich Shklyarskii (1918-1942).

See: L.I. Golovina, *Russian Mathematical Surveys* (1970), 25(3):184

E.D.: He was 5-6 years older than you were, right?

A.Y.: I think fewer than that, maybe 4 years.

E.D.: These were very happy times. Later both you and I got involved with this type of work.

A.Y.: Yes, yes, these were very happy times. There was a tradition that we all called him Dodik.

E.D.: Yes, of course, the same way that I am still Zhenya to Karpelevich and all other participants of my early circles.

A.Y.: By the way, in 10<sup>th</sup> grade Sakharov did not come to the mathematics circle. When we asked him why, his reply was: "Well, if there was a physics circle at MSU, I would join it, but I am not interested in the math one." Perhaps he didn't have the love for strictness. Indeed, he was more of a physicist than a mathematician.

E.D.: Well, these are different sciences, different styles.

A.Y.: We continued on seeing him, visited his house several times. He used to live not far from us.

## Part 2

A.Y.: My brother and I used to say that one of us would go to Fizfak,<sup>11</sup> and the other one would go to Mekhmat,<sup>12</sup> and that we would flip a coin to determine who goes where, and in reality we would both study in both departments. But I think it was a little bit of a game. I went to Fizfak, and he went to Mekhmat, and I think it was predetermined to be this way.

At first we actually did study together. I studied only in Mekhmat because Fizfak didn't have any physical disciplines except for general physics. We attended the general physics lectures together.

E.D.: It was some sort of a nightmare - Mlodzeevski.

A.Y.: He was excellent at demonstrating experiments.

E.D.: Yes, and he would tell us about Einstein's idealism, and would explain that inertia forces are imaginary forces. Overall, he was fighting with idealism in physics.

A.Y.: Everything was quite uninteresting, so we eventually stopped going.

During our first year we went to the seminar of Gelfond<sup>13</sup> and Schnirelman<sup>14</sup>. It was presumed to be analytical number theory and complex variable theory, so they were very disappointed, that we, the first year students, came. I should say that Gelfond was amazing. Taking into account that the majority of the audience were first year students, for the first two or three lectures he was talking about the complex variable theory to people, who didn't even know the integrals yet, didn't know anything at all yet. And it was taught in an interesting and engaging way.

And then the theory of numbers came. For example, we were taught density according to Schnirelmann. Everything was very good indeed. But it didn't last long. And then Gelfond came and said that Schnirelmann died.... I don't remember if he was crying, but he was extremely upset. Gelfond couldn't say that Schnirelmann had committed suicide: in some ways he was a

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<sup>11</sup> Department of Physics.

<sup>12</sup> Department of Mechanics and Mathematics.

<sup>13</sup> <http://www-history.mcs.st-and.ac.uk/Biographies/Gelfond.html>

<sup>14</sup> See <http://www-history.mcs.st-and.ac.uk/Biographies/Shnirelman.html>

very Soviet person, and he could have simply been scared. In any case, everything possible was done so that we didn't understand what was going on.

E.D.: Naturally. Do you know what really happened? Sofya Aleksandrovna Yanovskaya told me that he had left a note saying: "I am dying honest to my friends and the Soviet power." They tried to make him an informer.

A.Y.: Evidently it was a great tragedy for Soviet mathematics that two endlessly talented and extremely honest people died: Urysohn<sup>15</sup> (very early) and Schnirelmann.

E.D.: Well, with Urysohn - that was an accident, and Schnirelmann - that's a crime. Sofya Aleksandrovna told me that the NKVD worker who recruited him was shot. However, that didn't bring Schnirelmann back to life.

A.Y.: Yes, and in place of Schnirelmann, Gelfond brought Delone. And soon Delone stole us all from Gelfond. He was an unbelievably engaging lecturer.

E.D.: By our time he no longer left that kind of impression.

A.Y.: In my opinion he was the best lecturer I have ever heard. He talked in a remarkably brilliant way.

E.D.: He was a nice lecturer, but by the time I was a student, it was closer to a circus.

A.Y.: No, it was unbelievably engaging in our times. Furthermore, he would invite us to his house, where we would stay till late at night.

E.D.: Of course, he liked gossiping with young people. He even said that the Soviet mathematicians were not allowed to the congress in Oslo because Trotsky was there. He had the courage for that in 1940s.

A.Y.: I went to visit Gelfond's house a lot later. Back then, naturally, we did not go to his house. Gelfond was a very talented mathematician and a good person, who stood up for many. On the other hand, he was a person completely devoid of sense of humor. He had some inner, particular party-like seriousness (he actually was a party member). I remember, for example, he was criticizing Kipling, saying that it was imperialistic propaganda, which left a funny impression on me. But he firmly believed that nobody should read him. He also criticized Chesterton (calling him anti-Soviet) for his novel "The Man Who Was Thursday," which was in my opinion a great parody of a detective novel. I don't know why he thought it anti-Soviet. At the same time he also strongly criticized Tairov, who staged the play "The Man Who Was Thursday."

He followed some sort of party orthodoxy. He was in fact very close to Vinogradov. There was even talk that Vinogradov's textbook on number theory was actually written by Gelfond. Gelfond was, in fact, the editor of the first edition, and Vinogradov, as is well known, is a good mathematician, but cannot coherently present anything.

And later we became friends with Pontryagin. We would also go walking with him, and he would talk about Luzin's tricks on Gelfond. It is well known that Luzin was a master at making fun of people. And Gelfond was, first, a member of the party, and secondly, without a sense of humor. And when Gelfond solved Gilbert's seventh problem, Luzin told him that he was personally requested by Nikolai Ivanovich Bukharin (then editor in chief of "Pravda") to publish a big article in "Pravda" about the solution to Gilbert's seventh problem. So Gelfond went to the appointment with Bukharin. Naturally, Bukharin did not admit him. Gelfond said that Bukharin was personally interested in his achievement, to what the secretary replied that Bukharin doesn't know anything about it, but if it is in fact such a great achievement, he can send a reporter to talk to Gelfond.

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<sup>15</sup> <http://www-history.mcs.st-andrews.ac.uk/Biographies/Urysohn.html>

E.D.: This is all very curious. A couple more years, and these kinds of details will be lost. Talk about Pontryagin. There is a famous photograph: Yagloms, Kronrod, Pontryagin and Shklarskii.

A.Y.: Additionally, there are also very young Boltyansky and Yablonsky, who were then receiving the first prizes at the Olympiad, and a small girl Nelya, who also received the first prize. She was then in the seventh grade, and did not subsequently become a mathematician.

E.D.: I remember the times, when Kronrod, and maybe even you, insisted that cute-looking girls should receive awards, even if they did not really deserve them, because cute girls are needed in Mekhmat.

A.Y.: We supported him, but the idea definitely belonged to Kronrod. He even managed to achieve a strange resolution that any member of the organizing committee of the Olympiad can award a third prize to any girl he liked (but no higher than third) if she is pretty and everyone agrees with that. And I remember at least one girl received the prize in precisely this way. Her name was Tanya Doronina, who is now married to Ivashov-Musatov.

Isya and I fought hard for Lelya Morozova, who was in our mathematical circle. But everybody admitted that she deserved the third prize herself, regardless of her appearance. She later always played a very positive role in the Department.

E.D.: So Pontryagin used not to shun friendship with Jews? There is a legend that he became antisemit because Lida Udenson refused him mutual feelings.

A.Y.: I think this is nonsense. The only thing that I can say is that Pontryagin was always surrounded by cute Jewish girls. Rosa Bari and Asya Gurevich belonged to the first generation.

E.D.: Rosa Bari, who later married Efimov.

A.Y.: And Asya Gurevich, who married Rokhlin. Those were his first graduate students. And he was serious about courting Asya. He was seriously in love with her. In the next generation, before Lida Udenson there was Lena, who went on to marry Borya Katsenelbaum. And there were many such Jewish girls around. I am not talking about the boys, because my brother, Kronrod, Borya Rosenfeld and I, all of us went for walks with him.

E.D.: Did he ever show any hostility towards you?

A.Y.: No, quite the contrary. Pontryagin was an odd person. He would always ask, what people looked like, and he discovered a mutual female friend with Borya Rosenfeld, based on the description of her appearance. Neither knew her last name, and somehow they remembered different first names. However, based on the descriptions of her appearances they agreed that it was the same woman. So when we would go on walks, he would always ask of people's appearances. He would also ask about sceneries. He went blind when he was 12, and he never tried to cover up his blindness.

During the war time, he was the only one of my professors, with whom my brother and I kept up the letter exchange: he would write letters to us from Kazan. In fact, he did not know Braille's alphabet, and his mother read to him. She had learned foreign languages so well that she could read mathematics articles to him.

E.D.: Yes, and then he sent her to the hospital to die, and altogether humiliated her.

A.Y.: Yes, and that too. Did you know that she died only a few years ago? She was mentally ill, and died in a mental institution. Lida Udenson would visit her. I knew the mother as well. She was convinced that no woman would ever be able to live with him. She considered Pontryagin her property, and her entire life revolved around that. She would walk with him, read for him; she managed to write something for him without knowing mathematics. He typed up his

works himself. By the way, he typed his letters to us on a typewriter. I think that during the war he must have had other correspondents as well. Probably all Jewish.

E.D.: This is some sort of extremely fascinating phenomenon.

A.Y.: Also, it is important to know that in at least two cases Pontryagin helped to get people out of camps: Rokhlin and Efremovich.

E.D.: Kolmogorov was also involved in both cases.

A.Y.: Yes, but Pontryagin was a lot more active: In regard of Efremovich he went to see the Internal Affairs Minister Kruglov. But what happened to him, nobody really understands. It is likely that his wife had a great influence on him. People say that she was a very mean woman and an extreme antisemit. In fact, Pontryagin himself states in his autobiography that he started reading the plans by Fizmatgiz<sup>16</sup>, and his wife, after looking through these plans, stated that all authors sound the same. Perhaps, this appeared in the newspaper “For Socialistic industry” that was also antisemitic. Several articles by Pontryagin appeared there.

E.D.: It is hard to expect anything like that from Kolmogorov. Maybe he was not a judophile, but he definitely wasn’t an antisemit.

A.Y.: He definitely wasn’t an antisemit. When it comes to Pavel Sergeevich Aleksandrov, in some ways a more refined intellectual than Kolmogorov, with all his attempts to adapt to the authority, this was one of the things that he could not adapt to.

E.D.: As you know, Urysohn was his close friend. Have you read his famous article in *Uspekhi Matematicheskikh Nauk*<sup>17</sup> about Ivan Matveevich Vinogradov as the scientist and the director of the Steklov institute? Shiryaev explained to me that this article was written in a very pragmatic fashion: Shchepin was his latest favorite, and it was very important for Pavel Sergeevich to get him a position at the Steklov institute. And he was ready to do anything for that. Pavel Sergeevich has in fact left his half of the dacha in Komarovka to Shchepin in his will.

A.Y.: However, the one thing that I will stand by is that Pavel Sergeevich was extremely irritated by antisemitism. (He did not hide it, at least in my presence, and I am convinced that it was absolutely sincere.) It was like a personal insult for him. He thought of himself as a member of Russian intelligentsia, and he felt that it is an insult to all Russian intelligentsia.

E.D.: Well, Kolmogorov said that no “percentage norm”<sup>18</sup> could be applied to the most talented people.

A.Y.: Yes, Kolmogorov said that, and he wasn’t pleased with antisemitism either. However, as I recall, there were no Jewish among the people very close to him.

E.D.: There weren’t, and that is the other side of his life. His personal likes are one side, and his dedication to mathematics is a completely different side. And he put on all his medals, and went to the Ministry to protect me when they wanted to send me to the Pedagogical Institute in Vitebsk after graduate school. He also stood up for Sinai, Dobrushin, and Yagloms. He had a very high opinion of Sinai, and valued extremely highly the half-Jewish Arnold.

A.Y.: Yes, of course, of course, for all of us he did a lot of good things. And of course, Andrei Nikolaevich felt somewhat insulted by the antisemitism, he couldn’t accept something like that.

Now I will tell how only once I had an argument with Andrei Nikolaevich. It was during a banquet after the thesis defense of one of his students, Arato from Hungary. At that time such

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<sup>16</sup> Publishing house for Physics and Mathematics.

<sup>17</sup> English translation “Russian Mathematical Surveys” was published until the last issue of 1997 by the London Mathematical Society and the British Library.

<sup>18</sup> A maximal percentage of Jewish students existed at universities in the Russian Empire till 1917.

banquets were still allowed. I was an official opponent. It was the only time in my life when Andrei Nikolaevich yelled at me. This is what happened: for some reason we started talking about politics. I had read in a newspaper that some sort of united French-German military units were being assembled. And I said that it was wonderful, that it was the end to historical disagreements, and that in general I dislike nationalism. And suddenly he started yelling at me: "How can you say such things! French had suffered so much from the Germans. French are wonderful people, and Germans are just roughnecks, and they are always dream to grab something." Where did he get these anti-German ideas?..

E.D.: What was his relationship with Hilbert? He used to visit Göttingen.

A.Y.: Yes, he used to visit Göttingen, and he actually wrote that he didn't like it in Göttingen. But he liked France a lot. He was fluent at both, French and German, but preferred French (and he did not know English). So he literally screamed at me. The outcome was a little unexpected. He called me the next day (he did that extremely rarely) and said: "Akiva Moiseevich, I have never visited your new apartment. I will be in your area today, may I visit you?"- That was his somewhat unconventional way to say he was sorry for his behavior the night before.

E.D.: He was, indeed a very special person. In his presence I always felt (and probably many others), that he is a great man.

A.Y.: No doubt of that.

E.D.: You see, that is very rare.

A.Y.: Yes, indeed, he is a great person. But now, as I am getting old, I am realizing that quite frequently (and even now) I have been in the presence of another great man – Andrei Dmitrievich Sakharov. I have different opinions of their human qualities. But Andrei Nikolaevich is definitely a great man. And he gave us extraordinarily much.

E.D.: And not only to us.

A.Y.: His large, gigantic school. In fact, I have always thought that although Andrei Nikolaevich could help through not the most deserving people, he would never intentionally fail the ones who deserve. He would always help those who deserve it. In the end, unfortunately, he changed a little.

E.D.: It was still some sort of light spot in a dark kingdom.

A.Y.: No doubt of that, although, he was a compounder. I was very disappointed by his letter with apologies in relation to Mendelism-Morganism<sup>19</sup>.

E.D.: I do not judge him. On the contrary, I think that he easily got out of this because he did not publish anything on this topic.

A.Y.: However, there were certain things that he did that irritated me. And now it is hard to fight that. For example, introducing letter M instead of E for mathematical expectation. Because letter E is "expectation," it is "Erwartungswert," it is "esperance mathematique"- in English, German and French. They are three different words, and all of them begin with letter E, and in Russian it is "математическое ожидание."

E.D.: My entire life in Russia I would write M - but that doesn't matter. What difference does it make?

A.Y.: Kolmogorov introduced it specifically as a battle against cosmopolitanism.

E.D.: I don't think so. Didn't he have it in his first edition of "Foundtions of Probability Theory"?

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<sup>19</sup> The word used in a political campaign in the USSR against the classical genetics associated with names of Mendel and Morgan and declared to be a reactionary pseudo-science.

A.Y.: No, he had E in his first edition.

E.D.: Well, it is better to write a letter than to kill people.

A.Y.: Yes, it is better indeed.

It is worse though that he signed the letter against Solzhenitsyn. I think that there was some nationalism in him, and Solzhenitsyn had to be somewhat close to him. And together with Aleksandrov they signed a letter against Solzhenitsyn that they should not have signed.

E.D.: You know, they signed it mechanically. They were punched, punched, punched, and they got used to....

A.Y.: Kolmogorov still was often a compounder. During the election to the Academy, he was supporting Tihonov only so that Markov didn't get elected. He disagrees with Markov regarding the foundations of mathematical logic.

E.D.: I can tell you something about Markov. At some point during Stalin's time there was an address to the Central Committee of the Communist Party that just as there is Morganism-Mendelism, there is also a set-theoretic idealism. A.D. Aleksandrov and Markov talked at the meeting of the Moscow Mathematical Society and blamed Kolmogorov in set-theoretic idealism. Those were not jokes – it was in 1952 or around that time. And Kolmogorov even asked Sofya Aleksandrovna Yanovskaya as a philosophy expert if she thinks that this attack was justified.

A.Y.: Now about Close Friendship.<sup>20</sup> You were saying that Kurosh repented. I don't remember him repenting. It is strange that a person, who wasn't ideal later, was, in my opinion, excellent here. Markushevich repented in a very funny way. He was blamed that he had explained to his students, two Jewish boys, that he cannot accept them to graduate school because they were Jewish. Markushevich publicly repented: yes, he did not know that he couldn't say that, and he will never say that again.

E.D.: But you weren't present there.

A.Y.: I wasn't present there, but Isya told me. By that time Isya was an associate professor, and he simply exited during the vote.

E.D.: What do you mean exited? As a demonstration you mean?

A.Y.: To avoid partaking in the vote, because everyone was voting, not only the members of the scientific council.

E.D.: I don't remember any of that. I am younger than your brother, but I was present there. And I remember that story with Kurosh, who had to deny everything there. And, by the way, Sofya Aleksandrovna was in the same awful position. But she simply did not come. Being in a poor health, she went instead to the hospital.

A.Y.: What pertains to Kolmogorov, Kolmogorov had a very pragmatic presentation, and somewhat unpleasant, as Isya said. But he wasn't ready to accuse Kolmogorov. He had a concrete task. He had to protect Yura Prokhorov, so he was trying to explain that different people were guilty in different ways, and they should not be put in the same line. And nothing could be said here, since it is true that it was hard to help Akivis, Lifshits and others.

And Isya said that he was deeply shaken by the speech of Khinchin who stated that he, Khinchin, feels extremely guilty. Although, of course, he did not have any personal relationships with any of those people (he never had any students), nevertheless, he felt guilty because they took his lectures, and he did not recognize them.

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<sup>20</sup> A group of fifth year students (mostly Jewish), accused of slander against the Soviet government since they were discussing discrimination against Jewish in graduate school acceptance process. Nearly all of them were expelled from the university right before graduation.

E.D.: I don't remember any of that. I remember that Gorbunov addressed the meeting with accusations. Lidsky was also there but he remained silent.

A.Y.: Lidsky behaved decently. He was a party member. And when he returned from the army, he was offered to go to graduate school but not to Gelfand, so he refused.

E.D.: We have just skipped a large chunk of time.

A.Y.: Although Khinchin was considered the best lecturer at Mekhmat, he was after all a great lecturer for weak students. He would speak well, but was too detailed.

E.D.: I have never taken his lectures, so I wouldn't know. I looked through his "Eight lectures in Calculus" – not bad. In my freshmen year, Gelfand was a good lecturer for me. He was actually an awful lecturer, but he turned me into a mathematician. Just like Kolmogorov.

A.Y.: Just like Kolmogorov, who was also an awful lecturer in my opinion. At some point I was teaching problem solving for probability theory right after Kolmogorov.

E.D.: I have taught that as well.

A.Y.: I had a completely female group, incredibly weak. And Kolmogorov proudly told me that during his first lecture he talked about everything up to and including the law of large numbers, but when I came and asked "So what were you taught during the first lecture?" there came a shy silence, and then the girls said: "We didn't understand anything." And to be honest, that entire year I would start by first summarizing the lecture by Kolmogorov. Strong students did not come to these sessions, but the weak ones did, and they couldn't understand anything in his lecture.

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A.Y.: So we did see a lot. I am very sad that Isya did not record his memories. They would have been incredibly interesting, although they would have probably contained some incorrect elements, because sometimes he talked through his hat. There were some situations in which our two memories were dramatically different. And frequently it was impossible to check what really happened.<sup>21</sup>

E.D.: Well, tell about Israel Moiseevich. How did you meet him, and how did you work with him?

A.Y.: I have never heard his lectures. He ran the problem solving sessions before the war, but I never went to such sessions. So we met in relation to the program for high school students. He was one of lecturers, and in one of the prewar years he was the chairman of the organizational committee of the Olympiad while my brother and I were the members of the committee.

E.D.: I can repeat once again what I have already stated about Isarel Moiseevich Gelfand: I owe him a lot. Yet people say diverse things about him.

A.Y.: Well, he is a complicated person. I think that for many years he was under a positive influence from his wife Zorya Yakovlevna Shapiro, a very charming woman. We live now in the same building, and we all love her very much. I have to say that Gelfand was never any ruder to any other people as he was to those, closest to him. It is unbelievable how he treated Zorya and Yura Shylov at his seminar.

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<sup>21</sup> [Note by E. D.] This remark has to be taken into account in connection with the description of Markushevich's, Kolmogorov's and Khinchin's speeches by Isya Yaglom mentioned above. Probably I would remember them, but I have no such recollection.

E.D.: And, of course, what he was doing to Naimark and to other members of his seminar.

A.Y.: Only a little bit to Naimark, but he simply yelled at the others. However, he never yelled at me.

E.D.: He never yelled at me either. However, at some point I resented and stopped to attend his seminar.

A.Y.: He was indeed a very difficult person, although he accomplished a great deal. Although he would exploit people a lot. In summary, he isn't an ideal person, but still a very interesting one.

E.D.: Indubitably. And how did you start working with him?

A.Y.: Right here – typical Gelfand. He made me an offer himself.

E.D.: Of course. When I was a freshman, he offered me and Kronrod to write a supplement to his linear algebra textbook.

A.Y.: He recruited me later, when after the war I came back from the evacuation from Sverdlovsk. He was then interested in theoretical physics, and he was very attracted to the fact that I graduated from Fizfak. So for some time he simply flattered me to persuade me to work with him. And he persuaded me in the end.

E.D.: He could be very persuasive.

A.Y.: Yes. And I was very engaged in our work with him. I think that I got extremely lucky with my teachers because I can view both Kolmogorov and Gelfand as my teachers. I worked quite a lot with Gelfand. The paper on functional integrals is very typical in the way that Gelfand did not write it, just like all our joint papers. But this was the only paper that not only did he not read, but he didn't even want to talk about it. He said that we shouldn't work on that. We had a joint seminar on Functional integrals in Mekhmat. Quite strong students came to that seminar. Mityagin and Gorin were among them.

### Part 3

I was talking about the seminar on Functional integration, which Gelfand and I run in Mekhmat. We came up with a detailed outline. (With him no work ever gets done for the whole day, up until eight, but 8 to 11 he works energetically and you are late for the metro). After that he came to the first three classes, and was very involved, but then he stopped coming. I did come to him with some questions a couple of times, and we discussed something. But he stopped going to the seminar. After I said that the seminar was successful, and suggested that we write it up as an article. He said: "You run it, you should be writing it. I didn't really partake at all. Let it be your work." I questioned, how it is possible, we both had worked on the outline. He indeed played a large role, and the idea of the seminar was his, but he wouldn't come to class. "No, it was your seminar, you do the writing." I wrote it up and came to show it to him. And I could see that he really wanted his name to be there as well. He asked: "Do you really think that it should be your work?" – Although I don't think that, he told me that himself. It was a very explicit teasing, and I said: "Well, Israel Moiseevich, I did offer it to be a joint work. Would you like me to add your name?" "Well, if you insist on it..." I wasn't actually insisting.

E.D.: So the end result was Gelfand-Yaglom?

A.Y.: Gelfand-Yaglom. I think it would have been less popular had it been only Yaglom. I believe that the article would have still been popular, just not that much. And I think that Gelfand has long forgotten the odd circumstances behind writing this paper.

E.D.: Well, of course, we are all sinners, and he, evidently, has some ambition, or maybe even vanity.

A.Y.: Yes, and it is necessary to add that he received Stalin's award for his work with Naimark. And in order to justify giving it only to Gelfand, works of Gelfand and Yaglom on relativistically invariant equations were added. Officially, the prize was for "Work on infinite representation groups and their application to the theory of infinite relativistically invariant differential equations." Gelfand gave 40% of the money to Naimark, and 10% to me, leaving 50% for himself. I have no complains about myself. However, I think that he should have given Naimark as much as to himself.

E.D.: It is not only about money.

A.Y.: Of course. And in the beginning he said that he would protest and would not accept the award without Naimark. As Volodya Rokhlin told me, the same happened with the award to Sergei Novikov. Novikov was saying that he would not accept it without Rokhlin, but he accepted it in the end. Since I started talking about that, it is rather odd that both Kolmogorov and Gelfand were very sensitive to references to their work. They were referenced so frequently and so much and any omission was the rare exception. Nevertheless, they talked about that like being offended. And Gelfand would always bother me, since I am Kolmogorov's student "Who is a greater mathematician, me or Kolmogorov?"

E.D.: And what did you answer?

A.Y.: I never said that he was. I either angrily said: "Kolmogorov" and added something about the role of general ideas or I said: "You know, I think it is absurd to compare. It is a partially ordered set, and not the ordered one." And I do believe that.

Gelfand is, of course, a great mathematician.

E.D.: Naturally. However, Kolmogorov isn't small either.

A.Y.: I think that Kolmogorov is even greater. In some depth. He doesn't have technically difficult works. But Gelfand doesn't either. The technically difficult part was done not by Gelfand but by his collaborators. Mark Gregorievich Krein definitely has some challenging works, but he is a slightly less prominent mathematician than either of the two. He is a very strong analyst, able to overcome serious technical difficulties. But the impact of a work depends not only on the level of its difficulty.

E.D.: Of course. I don't know what is harder: the Lebesgue integral or the Denjoy integral. I think the Denjoy integral is harder.

A.Y.: Well, I find it unfortunate that Krein is underestimated.

E.D.: He is highly regarded in the West.

A.Y.: And highly underestimated in the Soviet Union. Krein is a little provincial, but he is very honest, just a very good person.

E.D.: I don't know him personally, but he is an excellent mathematician.

A.Y.: He has very many students who adore him. He does not exploit students, but helps them, absolutely selflessly.

E.D.: I think Gelfand is a little offended by me. In my mathematical childhood I was his student, but later I refused to work with him.

A.Y.: And Kolmogorov has a grievance against Gelfand. There are two joint articles by Kolmogorov, Gelfand and Yaglom. I interacted both with Gelfand and Kolmogorov, but Kolmogorov said: "Unfortunately, I cannot work with Gelfand." There was a famous story, when Kolmogorov was the chairman at a meeting of the Moscow Mathematical Society. Gelfand was

the speaker, and he was running late. When Kolmogorov was told that Gelfand was just a floor below talking to someone, Kolmogorov got up and left.

E.D.: Yes, I remember this well. Many got irritated by Gelfand.

A.Y.: Yes, yes. So there are three papers by three authors whom Kolmogorov arranged in alphabetical order: Gelfand-Kolmogorov-Yaglom. In one of the papers he used parts of a talk by Gelfand and Yaglom. But he wrote the entire paper, and sent it to us with a question: if we didn't mind a joint publication. And another case – a big paper in “Proceedings of the Third All Union Mathematical Congress”. Kolmogorov's irritation was expressed in the form of a footnote “The first and second sections were written by Kolmogorov, the third and fourth sections were written by Yaglom”. This paper was reproduced in the third volume of Kolmogorov's Selected Works. Very typical Kolmogorov, claiming that certain formulas belong to Yaglom. I swear, I didn't derive them! The works by Kolmogorov and a collaborator were usually written by Kolmogorov.

The editor of the book by Gnedenko and Kolmogorov told me: she understands, when in the middle of the book by two authors all of a sudden the second half has different symbols, but that book was written by only one person! Of course this was Kolmogorov.

E.D.: The young Yura Prokhorov was the technical editor, and Kolmogorov once said to me: “If I was writing with Prokhorov, it would have been a lot easier.”

A.Y.: Krein once told me that he wrote the first two Gelfand's works. Those were Gelfand's talks, but it was impossible to make him write them, so Krein wrote them himself.

E.D.: Israel Moiseevich is a complex person, but I have to say that as I was leaving for America, I called Kolmogorov and Gelfand to say goodbye. Kolmogorov was in Komarovka, and I told his wife Anna Dmitrievna that I was leaving, and asked to let Andrei Nikolaevich know... Andrei Nikolaevich did not react in any way, so I never said goodbye to him. Then I called Gelfand. We said goodbyes, and he wished me all the best.