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E. B. = Eugene Dynkin

R. L. = Roland Dobrushin

E. B. Let us start from your early life. Where are you from, what about your ancestors?

R. L. Well, I have two family lines. One is the common Jewish line of the Dobrushin's. There is a Dobrushin in Kharkov who has drawn up the genealogy of all of the Dobrushins. According to his claims, the first Dobrushin drove a herd of horses from Baltic area to Ukraine at the time of Catherine the Second. From him come all the Dobrushins.

E. B. And this Dobrushin worked mainly with the horses?

R. L. I don't know anything more about him. I tried to find out from some linguists if my last name has a Jewish or Slavic origin. And the best linguist of my friends—Andrei Zalizniak—claims that it is Slavic all the same, from the Slavic name Dobrusha. Nonetheless, these were ordinary Jews. My grandfather, who was a lumber merchant near the city of Kravevets, a former Chernigov province, had an enormous family, then went bankrupt and died. My father was the youngest of his sons. These were the years of the revolution, when he couldn't get an education anyhow, but was considered a timber engineer without education. But recently I found out that in '20s, he was a prosperous (?) NEP man. This was hidden for a long time. In the '20s he had a horse carriage and drove around Moscow, which was a very stylish thing to do at that time. Then he was a timber engineer at Leningrad Harbor, a specialist in exporting timber. This was a family profession. And there he met my mother, who was from an entirely different background. Hers was a family of a German craftsman on Vasilyevskij Island. I was told that he has been the best, at least one of the best, master cabinet makers. He made model boats for the navy—one of the highest fine arts. This was a German speaking family, protestant, although with a rather diverse background. It seems that among their ancestors were both Latvians and Estonians...

E. B. No wonder you have this sort of connection with our colleagues in the Baltic area.

R. L. Maybe. I feel myself at home in that place. I don't know if it is connected with ancestors. My mother's last name was Bokum. And actually my grandmother carried me to be baptized. So I was baptized in the protestant faith, which is how I got the name Roland.

E. B. That name you know, is associated-

R. L. with the German tradition, Baltic ones, of course.

E. B. Furious Roland...

R. L. Right. And my Jewish relatives have called me Yulik.

E. B. And the majority of your friends call you the same way.

R. L. Yes... I know how my maternal grandfather died off. His toe festered and a part of it had to be cut off. He didn't agree. Then the whole toe had to be cut off—he didn't agree. Then half a leg—he didn't agree. And eventually he died.

My mother is recorded as a Russian for the following reason. They had to be recorded as Latvians, since they were from Latvia, but this was very dangerous in the 20s because Latvia was a bourgeois country. And, as she explained, she had a choice: mark herself as a Russian or as a Jew. Both options seemed fine, but for some reason she wrote Russian. So officially I am a half-Russian.

E. B. But still, what is written in your passport?

R. L. I was sixteen, and I had to choose how I wanted to write in it.

E. B. You yourself chose?

R. L. I myself.

E. B. What did you choose?

R. L. I wrote Jew. This was in '45, and then I already understood well what it means to be a Jew. That's why I wrote it.

I. G. [E. B.'s wife] But by Jewish law you aren't a Jew.

R. L. Now I understand that well, but then I didn't know. No, but somehow when confronted by such a choice, it was natural to make the harder decision.

I was brought up not by my parents. My father had died when I was six years old and my mother even before was sick with tuberculosis. At that time this was a very harsh disease, so she was practically unable to work. Well, somehow she lived in the hospital and came back...she was a self-taught artist, not admitted to the Academy of Arts because the quota for children of single artisans—this was her official social status—was very low. Afterward, she studied in some studios, she earned a little extra, she designed some candy wrappers. My father had seven siblings, all in Moscow, and when he died they brought me and mother to Moscow. I lived with my aunt and uncle. And when my mother died a few months before I turned 16, they officially adopted me.

E. B. And what kind of people were they?

R. L. My uncle was a rather famous Soviet sculptor Chaikov. In his youth he was a good sculptor, then he came to be a socialist realist...

E. B. And successful?

R. L. He was successful before the war. At some point he was even chairman of the Society of Russian Sculptors. This sort of thing was possible in the 30's for Chaikov Iosif Moiseevich. All Soviet people knew one of his sculptures: "Soccer-players". It stood in front of the Tretyakov Gallery for a long time. The reason was that its center of gravity was such that, although it seemed it should fall, it did not.

E. B. They had no children?

R. L. Right. No children. I had another uncle, a rather well known Yiddish writer, a playwright, who perished together with the Jewish Antifascist Committee. So I practically lived in their family. There were no material hardships.

E. B. They were not a subject to repressions?

R. L. No, for some reason. They themselves were always surprised.

E. B. "If not, then why?"

[This is a quote from a joke: "Have you been a subject to repressions, and if not, then why?"]

R. L. Well, that's just luck...

E. B. So now tell me...

R. L. About my acquaintance with mathematics. My first encounter was when I, being in eighth grade of school, wandered by chance into the Olympiad where Fridrich Karpelevich, who was my classmate, took me...

E. B. So you studied in the same school?

R. L. Yes, in the same class.

E. B. I hope that I will meet with him some day, perhaps in Moscow.

R. L. Yes, of course. He just now started to work on networks of communication systems and he is coming to our seminar at the Institute. Recently he published a joint paper with Sasha Rybko.

What happened at the Olympiad is a well-known story that was already published at some place. I solved all the problems. And in one I had to use the Pash axiom, saying that if a straight line crosses one side of a triangle, then it crosses another side. I wrote that I can't prove this because, to my shame, I didn't know what a straight line was. This impressed the jury and I got the first prize. After that I never had such a success. Probably, because I felt that I must solve all the problems. Only once I came to kruzhek of Kronrod ["kruzki" – mathematical circles for school students at Moscow University]. And he offended me - this I remember. He was explaining that there was no smallest positive number greater than zero, and I asked "but infinitely small?" He laughed hard at me, and after that I stopped going to kruzki.

And when I decided to enter the university, I wanted to be a physicist. I don't know whether it was luck or misfortune, but this was a transition year when Jews were not admitted to the Fizfak [Physics Department] but were still admitted to the Mekhmat [Mechanics and Mathematics Department].

E. B. Was it year forty-six?

R. L. Forty-seven. I had a medal, not gold but silver. I graduated from school with all fives [the highest grades corresponding to A] except in the geometry because at the exam I wrote that symmetry arguments obviously imply that the center of a regular pyramid coincides with the center of its base. And this was needed to be proven. That's why I got a four [corresponding to B.] This story played a big role in my life, and that's why I love to recall it. Because of my medal I had to pass an interview instead of entrance exams. I didn't pass it. Besides being sick, I was not able to take exams. Otherwise I would have tried. That's how I found myself in Mekhmat. For the first couple of years I thought all the time whether I should transfer to the Fizfak. However I realized that I didn't like how physics was organized and how it was taught. I wanted physics to be organized like mathematics. Starting from axioms and in such a way that it is clear what follows from what. And only at a fairly adult age did I understand that this is not just the fault of bad teachers, but a property of physics itself.

And later, Evgenij Borisovich, was your seminar. I remember a problem in which I realized what probability theory is. For us, not knowing the word probability, the problem was formulated in terms of liquid: there are N reservoirs, out of each a portion of water flows into another reservoir, and you must prove that the quantity of water in each reservoir tends to a limit. Honestly, for me even now the probability is a liquid leaking out of one vessel into another. This is my intuitive vision of a random process.

E. B. What else do you remember from that time?

R. L. I remember that it was good, that it was interesting and very lively. I remember how you edited my first paper. It was on ergodic theorems and equations for homogeneous Markov chains.

E. B. Probably this wasn't your first work. Your first work was about the condition for non-explosion of continuous time Markov processes...

R. L. But this was a trivial work—there wasn't any construction, that is why it was not so hard to write it...No, you aren't correct—it was my first work. Maybe it was published later because it was long. But I remember well how you arrived from the Kolmogorov seminar in which he developed an idea how to build general equations, and how you formulated a chain of problems which I solved. Actually it was, I believe, an individual assignment for me.

E. B. I remember your work on inhomogeneous processes...

R. L. There were two works. One on their equations. In a situation when there is no transition density I introduced a sort of infinitesimal operator by using a general integral.

E. B. And split times.

R. L. Yes. The other work, I think, is not completely understood even to this day, although it contained some profound ideas about the conditions under which the trajectory is stepwise (that is only finite number of transitions happen in every finite time interval). Maybe someday these ideas will be understood if someone will need them.

Later on I worked under the influence of Kolmogorov (as I understand, you had decided that only Andrej Nikolaevich could secure my fate because of all the complexities). The next problem posed by Kolmogorov was to find all the limit laws for a series of Markov chains with two states. I started to deal with them. Then there were the limit theorems for Markov chains in finite state spaces. My fate was in the hands of Andrej Nikolaevich who really made things almost impossible at that time by leaving me as a graduate student on the eve of "the infamous case of doctors". This was very difficult. They gave me a four on my Marxism-Leninism exam even though I was perfectly able to pass such exams. I was very surprised and asked for the second exam, but they proved that, anyway, they could give me a four. Then, Andrej Nikolaevich specially came to my graduate school entrance exam on Marxism-Leninism—this I remember. Everything seemed fine but there were more complications. But one fine day I did not receive the scholarship support entitled to nominees for the graduate school – a sign that I was again derailed.

E. B. Did you know (so we might digress a little) that there was a kind of Certification Commission, approximately in '48 or '49, and each teacher at MSU was certified. It was written about Kolmogorov and Aleksandrov that "There are elements of formalism in their research" (or maybe "teaching").

R. L. No, I didn't know. Who told you this?

E. B. Well, I just know...first, from Sophia Alexandrovna [Yanovskaya]. It was such a slap in the face. They have been pillars in some sense. They applied to Petrovskiy [rector of MSU]. It seems that, in the end, there was a kind of hearing and that these "elements of formalism" were deleted.

R. L. And who did these ["elements of formalism"]

E. B. Ogibalov or other people of the same type. And do you remember “Tesnoe sodruzhestvo”? [“Close friendship” - a group of students accused of having organized a secret society]

R. L. Of course I remember. Well I watched it from below.

E. B. You were a little younger.

R. L. Much younger. I think I was in my second or third year when they were in their fifth. I love a related story about Yesenin-Volpin who was at that time a member of the Mekhmat Profkom [the trade union committee]. All the organizations, including Profkom, were supposed to discuss “Tesnoe sodruzhestvo”. Ogibalov came there and made a big speech. Then Yesenin-Volpin asked: “Please tell why do you think this organization was secret?” “Well—said Ogibalov—of course it was secret: I, the secretary of the party organization of the faculty didn’t know anything about its existence.” Yesenin-Volpin replied: “You know, until today I also didn’t know of your existence, but from this I have not drawn the conclusion that your existence was secret”.

What else should I recollect?

E. B. Whatever you like. I would like also to take an opportunity to ask (if there is an opportunity): do you remember how my 25th birthday was celebrated?

R. L. Yes I do.

E. B. I don’t know whose initiative it was but it was the most enjoyable anniversary. I was presented with a chocolate bunny, ping-pong, and something else I don’t remember exactly.

R. L. Wait a minute. It was your 25th birthday?

E. B. It was 1949.

R. L. We'de been preparing Dynkin diagrams made out of plasticine for one of your birthday.

E. B. Yes, my thesis defense was the occasion.

R. L. Exactly. Now I recollect. I remember because we tried hard to find the way to prepare this and used needles and plasticine which I took from my uncle, the sculptor.

E. B. Thanks to Andrey Nikolaevich, everything was okay with your graduate studies. And after that as well.

R. L. It was some kind of easy times when I was finishing my graduate studies. Kolmogorov had been a dean already, and leaving me to work at the university didn't cause me any difficulties. Anyway, the decision didn't involve me.

E. B. And then you performed some civil act.

R. L. As it was written in my character reference for many years: demonstrated political immaturity.

E. B. Tell how you had ‘demonstrated political immaturity’? To begin with, you were not a youngster at that time. How old were you, 26?

R. L. I think it was two years later after I defended my dissertation.

E. B. It was 1956.

R. L. In 1956 I was 27.

E. B. So how had you ‘demonstrated political immaturity’? Tell us about it, and then I'll make some comments.

R. L. So at that time there were the first signs of freedom, one of which was the appearance of a Mekhmat wall newspaper. I have already forgotten what actually

happened there. There were some quotations from John Reed not published earlier and something about sincerity which had been discussed at that time, Pomeranets...and some other historical material not to be published. And somebody wanted to use this opportunity to advance his career. All fifth-year students were solemnly expelled from Komsomol. Misunderstanding the situation, it was decided to do this at the general Komsomol meeting of the department in which all the students of the department attended and students from other departments were actually crowded out. And perhaps this was my first impression, which remained for the rest of my life: of participation in a revolutionary mob of people, where like-minded people shout down the opposition. At the start of the meeting, decisions were to be made by voting. And, by voting, it was decided to erase some “adversary material” from the newspaper. It did not cross the initiators’ minds that people may wish to know what it is that they are supposed to denounce. Various speeches were made – on both sides. And I made what, to my way of thinking, was a rather prudent speech. Probably, I have something of an oratorical gift, which seems to have emerged and apparently held an audience. This is the origin of my character reference.

E. B. My recollection is a bit different. It was 1956, there were events in Hungary, and a number of students had been expelled or would have been expelled from the University for criticizing the Soviet actions. And you told me in advance of the meeting that you were going to make a stand for the students, and you encouraged me and other faculty members to support it. I discussed this with Kurosh, who told me that it was a kind of suicide and would lead to no good. And after the meeting you told me what you had said there: possibly students made mistakes, but it’s wrong to herd people and to not allow them to express themselves, and, even if they are wrong, give them a chance to mend their ways...

R. L. Yes, something of that sort, but put mildly...I think, it was happening at the time of the Hungarian uprising, but it was about the newspaper surely. A number of really good students had been expelled...

E. B. I had not just gone to Kurosh, whom I considered fair, but I had also discussed the matter with him. He was horrified and said that it was childish and insane.

R. L. I realized how risky all this was and that, under other circumstances in our country, it could end really badly. But I had to express myself somehow ...

E. B. Someone, perhaps you, has told me that it cost you 10 years of working as an assistant...

R. L. Later I even calculated the cost of each word of my speech in rubles. It resulted in a nice number – 10 rubles per word. But I also think that Andrey Nikolaevich saved me. At least I wasn't expelled from the University, and I believe that that is due to Andrey Nikolaevich intervention. It seems he was not so angry with my coup de main.

E. B. Yes, there’s a lot to remember about him as well. And basically we all are terribly grateful to him, but he too had his triumphs and failures.

R. L. Sure, he is a man of compromise...

E. B. Besides, he was programmed. For instance, his speeches against Sakharov and Solzhenitsyn...

R. L. Well, apparently he had chosen to adopt a cooperative posture sometime in the 30's, i.e., to live within the framework of the system, figure out the minimum which is

required to remain a man inside the system and still have a possibility to act effectively when he thought it necessary. This is the way I understand him.

I like the story, I'm not sure if you know it, how he saved the theory of probability, by proving that the term 'independence' is not opposed to Marxism. Should I tell this story?

E. B. I don't know it. I know only some associated stories.

R. L. So the story is as follows (I like it). I was told that at that time some of the philosophers said that the term 'independence' is opposed to the thesis which states that everything in the world is interconnected. Kolmogorov invented an example of independent events which none of Marxists could oppose. Do you know about it? The example is the following: if a prayer about the rain is received and then it rains – these are independent events... Thereby he overcame such difficulties and arguments...

E. B. I know something that you perhaps don't know or don't remember. Surely you know that he published research works on genetics. And in 1948, after the infamous session of the Lenin All-Union Academy of Agricultural Sciences, a Moscow Mathematical Society meeting was convened to criticize genetics. It was expected that Kolmogorov would admit his mistakes. But he found a better way out. He didn't come to the meeting but instead sent a note which was read out by Lev Abramovich Tumarkin. His note roughly said: that it cannot be denied that science is an enemy of the randomness [a statement of Lysenko approved by Stalin]. Therefore, fortunately, true biology does not need any assistance from probability theory, and so there's no need for him to come and help the true biology...

I believe that, unlike other influential people of his time, Kolmogorov was sincerely interested in the progress of sciences and mathematics...

R. L. Absolutely...

E. B. He cared if a person was an outstanding mathematician or a mediocrity. Certainly, he, like any other man, had personal sympathies or antipathies: he liked some people more and some less.

R. L. I believe that the significant part of Moscow mathematics of that time is based on ideas that Kolmogorov generously distributed.

E. B. Exactly.

R. L. I think that, by modern standards, he should have become a co-author of tens, or even hundreds of works.

E. B. Unlike Gelfand, who was looking for co-authorship.

R. L. Kolmogorov always shared his ideas willingly and was always happy when somebody developed them, absolutely not thinking about a co-authorship...

E. B. Anti-Semitism was certainly strange to him. I remember that in 1946 there were difficulties with admission of Yulik Shreider to graduate school. There were seven candidates, and A. N. explained that, even under the quota for Jews in the pre-revolutionary Russia, Yulik could pass as the only Jew in the group...

R. L. It seems that even if he didn't like a good mathematician, he nevertheless supported him.

E. B. For instance, he always supported Gelfand even though sometimes he was (as were a number of others) annoyed by Gelfand's behavior.

R. L. In a sense, Kolmogorov is a man of passion with respect to people. And at the same time he was trying through his intelligence to temper his passion by objectivity.

E. B. When I was a child I believed ardently in revolution and communism ideas and so on. I was 11 when my parents were exiled to Kazakhstan from Leningrad, 13 when my father was arrested. All these events were awful tragedies, but I treated them as a Catholic child would treat the burning of his parents at stake: the God anyway remains the God. I had a belief, probably because there was nothing else at that time, nothing opposed, and my parents also protected me for my own good from any heresy. Then, when all this happened, I had a moral depression. I found the only way out - enter Komsomol. And only when I entered Moscow University, even though there was no straight political discussion, the atmosphere was different, and I felt that there's something else in the world apart from this truth of NKVD [predecessor of KGB].

R. L. No, I cannot say the same. I don't know why, maybe because I was younger. Even now I don't understand how I found ideas since, if my family had any ideas, there was never any thinking which might spoil a child's or their own fate. However I grasped some specific antagonisms from somewhere. I remember, for instance, my own first political awakenings. I was keen on reading newspapers – I still have this hobby - I started to read since my early childhood.

E. B. And I, at 10, followed the Leipzig process.

R. L. So I remember my first revelation in 1940, when it was announced that Bessarabia, which traditionally and historically belonged to Russia, and Northern Bukovina, which nationally belonged to the Soviet Union, had been united to the Soviet Union. [Two regions of Romania were occupied by the Red Army under the Molotov-Ribbentrop pact.] I recollect that I made a personal investigation and found that Bessarabia nationally and Northern Bukovina historically belonged to Romania. I was 11.

E. B. So you already had a critical mind at that age.

R. L. I don't know where I got it from, but I found it somewhere. In 1941 there was a pioneer camp for writers' children, and I've been there thanks to my uncle. So I heard the first anti-Soviet anecdotes there...

E. B. I heard anti-Soviet anecdotes as well...

R. L. Well for me the truth seemed to be in these anecdotes. Actually, I cannot say that it was an age at which I realized, seriously at least, what I understood. And perhaps it was the history of the party, when I've started to study it, that made me realize clearly what was actually going on. This fight with one enemy or another was quite evident to me. So I can say that I never took this ideology seriously. I resisted entering Komsomol for a quite long time – my parents demanded that I do it, but only in 10th grade did I yield and enter. But I could not make my daughter Nina enter Komsomol. She sabotaged my attempts and refused. So finally I retracted my demand. I always treated social life like some sort of a game, one in which I partook. The situation was a little strange, a bit like a mathematical exercise: assumptions were specified within which one had to act. I had also been studying Marxism-Leninism, passing it but never taking it seriously. To me it was some formal system, with rules which could be learned and even useful when learned. I recollect, for example, that I was making a report "Stalin is a leader of the world proletariat" at some conference. The topic was really difficult since to prove it was terribly hard, but I could collect all relevant quotations and make a brilliant report. There were two wall newspapers in Mekhmat and in one of them it was written that attendees applauded Dobrushin after his speech and in the other that the attendees rose in applause

in honor of Stalin after Dobrushin's report. Two interpretations... So that was kind of a game. But, you know, all these revelations and disclosures were not something new to me. After all, I had understood all this much earlier.

E. B. OK, let's get back to some other topic – your student experiences. Recall something good or bad about your professors.

R. L. I don't remember anything bad about anyone. I remember my first impression about lectures. Uzkov lectured on algebra and was good at it. I remembered for the rest of my life how he constructed a field out of two galoshes.

E. B. It's mentioned in a Mekhmat student song. I tape recorded this song performed by Karpelevich.

R. L. I really liked Uzkov's construction even though much of the idea was familiar to me. I remember Kreines lecturing about analysis. I recall that he gave a quite general notion of the limit over a partially ordered set. Most of the audience didn't understand it but, in contrast, I was really glad. It was clear and elegant. Delone lectured on geometry, but it was a bit not serious.

E. B. He seemed to be always acting as a buffoon.

R. L. Yes. What else do I remember about my study? Gelfand lectured on calculus of variations.

E. B. Did it impress you?

R. L. It was not bad. I was impressed during the exam – he liked to give each student a problem which the student would never solve.

E. B. It was his style.

R. L. So finally I revolted and got my A.

E. B. So it was relatively innocent... Well the tape is over.