
HISTORY OF SCIENCE

I. M. GELFAND'S SEMINAR ON BIOLOGY

Genius

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The legend of Cinderella: a university variant told by a fellow passenger, a student of the Faculty of Mechanics and Mathematics. After the ninth grade in a small town near Odessa, Gelfand was told by his teacher in mathematics, “Dear Israel, there is nothing I can teach you. Move to Moscow, find Moscow State University and the Faculty of Mechanics and Mathematics. Go on learning, and you’ll become a great mathematician!”

At the Faculty, the ninth-former was stopped by the dean’s secretary, “Young man, where your high school diploma is? Oh, you don’t have it yet! Then return to Ukraine and come back next year with the diploma!” But Gelfand could not return home. His teacher’s words about a great future sank deep into his soul. He decided to stay in Moscow and got a job of cloakroom attendant in the Lenin Library—to earn his living and to be closer to books. Once, young but already famous mathematician Andrey Nikolaevich Kolmogorov found him reading a monograph on higher mathematics. The mathematician asked, “Boy! Why are you are holding this book? You cannot understand a word in it!”

“I’m sorry, Professor, but you’re wrong!”

“Am I? Well then, here are three problems, try to solve at least one of them before I come back for my coat. You have two hours!”

Kolmogorov spend more time in the library than expected and gave his cloakroom ticket to another attendant forgetting about his task to young Gelfand. But when he was leaving the cloakroom, he heard a timid voice saying, “Professor! I have solved them...” Kolmogorov came back and took squared paper sheets written in running hand. He was astonished to find that *all* problems were solved, and the last one, the most complex, in an elegantly simple way unknown to him.

“Did anyone help to you?”

“I’m sorry, but I have solved everything myself!”

“You did it yourself?!! Well then, here are three more problems. If you solve at least two of them, I’ll take you as a PhD student to the Faculty of Mechanics and Mathematics. You have four days to do it!”

Four days later, Kolmogorov appeared in the Library cloakroom and immediately made his way to the sector served by Gelfand.

“Well, how are things going?”

“I think I’ve solved them...”

Without taking off his coat, Kolmogorov started to read the sheets written in the same running hand. After

reading, he gazed into Israel’s eyes and said respectfully, “I’m very sorry for doubting that you solved the previous problems yourself several days ago. Now you have proved that no one helped you. The point is that no one in or outside this Library could help you in solving the *third* problem: it was considered unsolvable in mathematics until now! Get dressed and I will introduce you to the Rector of Moscow State University.”

They found Rector in his office in Mokhovaya Street. He was sitting at his desk cluttered with papers and rapidly writing something. He lifted his head for a moment, “Andrey Nikolaevich! I need to finish this job urgently, and you rush in with a boy!”

“I am terribly sorry, but he is not a boy but a genius mathematician Israel Moiseevich Gelfand. He kindly accepted an offer to be my PhD student. I ask you to make the necessary arrangements.”

Thus, academician Gelfand never finished the tenth grade and never was a university student.

Acquaintance. Forty years ago, A.S. Spirin invited me to the Gelfand’s Seminar on biology. I came knowing nothing about the cruel rule of the seminar to make a newcomer give a one-hour presentation on any problem he likes. Moreover, the audience represented the elite of biology—the seminar was private with carefully selected participants.

I found a comfortable place in the last row between Inna and Fedor Severin and got ready to listen without knowing that it is me who is the speaker. Finally, not high round-shouldered man with vivid eyes somehow resembling my late grandmother entered the room. Fedor nudged my side and said in a terrible whisper, “He is Gelfand!” He took his seat in the first row, turned to the audience, and said, “We have a newcomer. He was invited by Alexander Spirin. Skulachev, please, go to the blackboard and tell us something interesting.” Luckily, I was in the last row and had some time to consider the presentation topic when I traveled across the long conference hall at the Institute of Biophysics. I decided to tell about my idea that the enzyme is not just a powerful catalyst of chemical reactions but a smart *self-tuning* catalyst capable to immediately evaluate the intracellular environment and to determine the place, time, and direction of the catalyzed reaction based on this evaluation. Fortunately, I have just sent to press a manuscript of a book with a chapter describing the concept of self-tuning catalyst.

The audience found the idea or, at least, reasoning original. I was interrupted with questions that I seemed

to answer well, since Gelfand suddenly rose, squatted, stood up, looked round the room, and exclaimed, "Look, where did you find him?" Fine lips of Spirin were smiling, and Inna's beautiful eyes were shining with proud for her friend. At this moment, I let things slide. For just a tiny little, I crossed the boundary between facts and inventions, and a couple of my next answers were, to be honest, audacious. I recollected myself and, luckily, the seminar neared its end. Cheered by the audience, Gelfand said, "I think he is accepted, isn't he?" Thus, I became a member of the famous biological Seminar for quarter of a century until it was closed in the early 1990s. But I learned the real Gelfand's opinion on my debut only 10 years later.

Once, Israel Moiseevich thought that the speaker sins against the truth to make his concept more attractive. Gelfand interrupted him and told an anecdote about memoirs written by a Leningrad actor. He sent his manuscript to his friend in Moscow with a note saying, "I send you my memoirs. Hope, you will see yourself what is true and what is my talent!" "I think," said Gelfand, "we face a similar problem with your attempts to make the presentation more attractive. If I need something attractive, I visit cinema! Do you remember Skulachev at the end of his first report also sliding to attractiveness? To give him his due, I never noticed it anymore."

Amazingly, how could he catch my flaw without being a specialist in the problem discussed. Amazingly, he mentioned it not after my first presentation but many years later, when I was in unrequited love with him and

when a non-failure presentation at his Seminar was the main marker of my scientific success.

Parting. In the early 1990s, a period of severe economical crisis in Russia, Gelfand was awarded the Kyoto Prize, the most valuable and honorable scientific prize awarded annually to a single scientist. At the same time, he was invited to organize a laboratory of neurobiology at Rutgers University in Newark. (Note that practical Americans invited an 80-year-old mathematician to lead a biological laboratory considering its international recognition and citation index—the highest among all scientists in Russia.) Gelfand accepted the invitation. The famous Gelfand's Seminar ended, which was an irreplaceable loss for intellectual life in Moscow. One year later, Gelfand returned for a short period and organized a meeting with mathematicians. It was held in room 536 of the Building A at Moscow State University, where his seminar on biology took place each second Friday. My office is one floor below. When I learned that Gelfand is in room 536, I ran upstairs and looked in just to see my idol. He noticed me and went out to the corridor, where we stayed for some time staring at each other in silence. I am not sentimental, but I felt tears coming to my eyes. Gelfand hugged me and tiptoed to kiss my forehead. Then I realized that my love to him was not entirely unrequited.

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