

## EARLY MEMORIES OF OLGA LADYZHENSKAYA AND OLGA OLEINIK

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My first memory of the two Olgas is learning about them from Lipman Bers. He first heard about them probably in the mid-fifties after Stalin died. Of course, Lipa, being Lipa, was trying to get me to enter into competition. I never did. The real competition was between them.

In the summer of 1958, there was an International Congress in Edinburgh and rather surprisingly, Olga Ladyzhenskaya was allowed to attend. I could not go, but I eagerly asked all about her from those who did. Then in September, my husband Herbert, a polymer chemist, went on a visit to Russia (one of the earliest to do so). I told him to look up Olga Ladyzhenskaya when he was in Leningrad. He wrote back to me about her stunning beauty and her intellect and how in a world of drabness, she managed to look stylish in an old beret and very simple clothes. I was very impressed.

Then in 1960, Richard Courant and Peter Lax went to Moscow. They visited Petrovsky, the Russian dean of partial differential equations and there they met Olga Oleinik. Not so long afterwards Oleinik came to the United States as a Soviet delegate to a Women's Congress. This was a bit unusual under the circumstances, but it meant that we were able to arrange a visit to New York University. And that is how I got to know Oleinik.

I cannot remember if I met Ladyzhenskaya before my visit to Russia in 1963. I went on an academy exchange for a month. Oleinik, who had begun traveling a lot, was out of the country, but I met Oleinik's students, Vvedenskaya and Wencel. Officially I was in Russia in my capacity as a "plasma scientist" so I did not meet the mathematicians except informally. But even so I heard constantly about the intense rivalry between the two Olgas and was repeatedly asked whose side I was on. I wasn't on any side. They were both brilliant mathematicians who had risen to the very top. A little later, they both ran important top departments. Did they suffer from prejudice against women? As far as I could see, the answer is "not overtly," but there was a pervasive attitude against professional women in Russia and I believe their very rivalry was aggravated by the gossip among men, a sort of "that's women for you" attitude.

In 1963, Russia had just emerged from utter darkness and there was a lot of hope in the air. I spent most of my month in Moscow, a week in Leningrad and several days in Tbilisi. The relations with China were souring, which came through in the rhetoric of the scientists on May Day. People were still very careful. My interpreter later told me that she did not ask me to her home as her husband had recently been released from the gulag.

I was thus quite overwhelmed when Ladyzhenskaya invited me to her apartment where she lived with her mother. Stepping into Olga's apartment was a step into the past. It was packed with books and furniture and art. For me, it exemplified old Russia and it probably was a piece of the old Russia when the Ladyzhensky family had been gentry. There was not a lot of space and I especially remember that the skis were stored out of sight in the tiny lavatory.

We sat for a long time and Olga told me of the death of her father, her first teacher, shot in the purges of the thirties. But by then (1963), he had been exonerated after Krushev's famous speech. I was simply appalled at the fact and even then wondered how she could have survived to study and achieve, especially, as I later heard, since after her father's death, and so-called disgrace, it was exceedingly difficult for the family even to keep bread on the table.

Her great-uncle, Gennady Ladyzhensky, had been a well-known water color painter in Odessa and we looked at some of his paintings. She was proud of her connections to the nonscientific world. Her mother stopped by but she spoke no English and my Russian was very, very limited. I could see, however, that Olga did not have household chores, which no doubt made it easier to work. And work she certainly did!

The only other person whose home I visited was Nina Uraltseva who lived with her son and husband in one room in a relatively small apartment. Through Nina and Olga, I glimpsed the way life was lived by professionals in the sixties in the U.S.S.R., in fact, how, hard as it was, it was still eminently possible for mathematicians to do mathematics.

I got to know Olga Oleinik in 1965. Gaetano Fichera invited me and Olga for overlapping visits to the University of Rome. It was the beginning of the chaos of the sixties. In Italy, it was not the chaos of the Vietnam war but the standard clash between left and right wing politics. Just before I came to Rome, there had been a physical clash on the long steps of one of the buildings and a left wing student had fallen or been pushed to his death. As unhappiness escalated, the university began to shut down. So Olga and I spent our time looking at Rome where there is a great deal to see and we had a very good time together. Olga kept quizzing me on the student uprising. There were big signs saying, "a bassa il Papa" which I thought meant "down with the Pope." In fact, Papa was the name of the head of the university. Oleinik wanted an answer for everything and I did my best. I was told later that she was, wisely it seems, in constant touch with the

Russian embassy and was just seeking my thoughts. Finally when Olga's lecture time rolled around, the university was totally closed with tanks lined up inside the gates. How could she lecture? The ingenious Fichera managed to find a secret way in and a lecture hall and an audience, and Olga was able to deliver her lecture.

During our many walks, Olga expressed her concerns for her son back in Moscow, her need to see him. It was only later that I learned that he had severe mental problems and that this was an unbelievable burden that she bore throughout her lifetime. Looking back, I realize that she might have wanted to talk to me about this problem, but I failed to respond. She asked me a great deal about my four children and followed their careers and whatever they were up to. This was, in fact, something both Olgas did.

In later years, on the whole, everything relaxed, but there were times when Ladyzhenskaya was very restricted in her travel, especially after the Czech invasion of 1968. I met her at a meeting in Poland in the early seventies and she came several times to visit the Courant Institute.

Both Olgas were at the International Congress in 1970 in Nice. Ladyzhenskaya was in a whirl of activity but she came with Nina to swim at the beach near my hotel. Oleinik also came for a picnic on the beach. She really relaxed and enjoyed herself more than I had ever seen.

Once Oleinik and the fluid dynamicist Belotserkovsky came for dinner with me in Paris. I was living in a garret which, while extremely charming, once you got there, involved climbing up three flights of pre-revolutionary stairs (pre-French Revolution), followed by a short, almost vertical ladder. On the way up, Belotserkovsky complained in Russian, but I understood, about those strange Westerners who thought living in slums was charming. Olga shushed him up. We had a very good party when we got to the top.

Both Olgas were enormously helped by Western medicine. I would have liked to help on that front, but mathematical friends in Germany and France were able to do much more.

Those are the old memories. We all grow older, times change, but looking back, I feel enormously grateful that I knew these two amazing mathematical women in their prime!

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