Mischa, my teacher

by Rodrigo Arocena

Mischa Cotlar arrived to Uruguay in 1928 when he was 15 years old, with his parents and a brother. From what he told me, his formal education consisted of only one school year in his birth country Ukraine before his graduate studies in Chicago. In Ukraine, his family's culture and library were his main source of learning. That continued in Montevideo, until Rafael Laguardia appeared in his life. Laguardia was the founder of the Uruguayan mathematical school and the first director -in the Engineering School at the Universidad de la República- of the Instituto de Matemática y Estadística named after him.

A man with multiple interests, Laguardia was interested in meeting a certain Mr. Cotlar who shone in chess. He paid him a visit and, generous as he always was, he asked how could he help him. The story told at the Institute was that Mr. Cotlar answered: "Thanks, I don't need anything, but I have a son who loves mathematics."

Mischa's first publication appeared in 1937: *Matemática Abstracta*, Boletín de la Facultad de Ingeniería, Uruguay. Laguardia had connected him to a group of young people who were dedicated to the study of mathematics. This group was sponsored by Laguardia and José Luis Massera, a scientist of exceptional creativity who, in Montevideo[1] in the Summer of 1938, was a witness for the wedding of Yanny Frenkel and Mischa Cotlar.

I met them both in 1967. When the Universidad de Buenos Aires was assaulted by the military government at the time, many professors accepted and offer from the Universidad de la República to work in the "Banda Oriental"[2]. That is how Mischa came back to the Institute where his first colleagues were, and with which he never lost contact. I saw him again after a few years, and many events, when in 1974 the School of Engineering from the Universidad de Buenos Aires offered to the professors from the Instituto de Matemática y Estadística, who had been fired by the Uruguayan military government, the opportunity to work in the "Banda Occidental"[3]. Mischa offered his house near La Plata[4] to the Uruguayan friends, and some of them

[1] Uruguay's Capital.

[2] This refers to the Eastern side of the La Plata River, that is Uruguay.

[3] This refers to the Western side of the La Plata River, that is Argentina.

[4] La Plata is a town in Argentina.

lived there. Mischa and Yanny repeated this type of gestures throughout all their lifes.

The La Plata River events forced us to move away from home. I went to Maracaibo[5], and I traveled every week to Caracas to attend a Seminar organized by Mischa to finish my "Licenciatura"[6] in the Universidad Central de Venezuela. There, with Cora Sadosky's help, I found a job in 1976. A privileged decade started for me, when I became Mischa's student and collaborator, while he and Yanny became beloved friends for my wife Judith and myself, and at the same time some sort of adoptive grandparents for our children, Miguel and Leonor. In exile usually grandparents are absent.

When we returned to Uruguay, we remained in close contact, and kept seeing each other in Caracas, Buenos Aires, and Montevideo. Around 2001, Mischa wrote telling me that he wanted to give a farewell talk at the Instituto de Matemática y Estadística "Rafael Laguardia". Some of the younger mathematicians, who did not know his work, but knew his unparalleled modesty and gentleness, were in charge of announcing the conference. Three generations of Uruguayan mathematicians overflowed the room. When I introduced him, I mentioned the age of 65, when some people think professors should retire. When Mischa reached that age, he had published 56 works, several with Yanny, and including some magnificent books; but after 65, I observed, he has published 40 more works that have opened a research area. It is said that mathematics is a youth's affair; certainly, the youth of the spirit.

Mischa's mathematics overwhelmed me, by its breath and depth, but it fascinated me, because of the richness of the connections, so often unexpected. His points of view showed that the, apparently nonexistent, links between diverse fundamental results existed and became evident and illuminating. Working with him made me suspect that there is nothing else in the world other than rotations and translations, and that the Fourier transform shows that they are the same thing.

His research program was, without any doubt, to show the essential unity of mathematics. Around that idea he built his life's work, like a house with multiple rooms, so many that I dare to believe that, even if some have a completed character, most of them have just been started; however, all of them are naturally interconnected. In that house, thanks to his generous

[5]Maracaibo is a town in Western Venezuela.

[6]In some countries, the first undergraduate degree is a Licenciatura, which is equivalent to an MS in the US.

mentoring, I found a room to work on the conjecture that, in several problems, there is an underlying translation that if extended adequately, will offer all the solutions to these problems. With that small tool I could collaborate with Mischa, and several colleagues, in an endevour that gave me many satisfactions as a teacher and as a researcher.

Mischa's intellectual program went much farther; it aimed, as far as I can understand, to make evident the essential unity between his philosophical conceptions of science and ethics. His doctrines abrebated from Pythagorean fountains. In this path it was much harder for me to follow him, because of my own limitations in knowledge and capacities, but not only because of them: where is the meeting place for a great master of the Pythagorean school and an old Latin American left wing militant from the sixties, educated in the intellectual tradition of classic socialism?

During those years when we met almost daily, we rarely touched this issue; I, because of discomfort and incomprehension; he, because his search for the unity of everything that exists gave him the utmost respect for diversity, that he considered illusory. When distance made our encounters less frequent, specially when old age started to settle in, I felt that it will be unforgivable to not even try to understand some of Mischa's deepest beliefs. Since these beliefs, according to Mischa himself, inspired not only a clearly admirable scientific life's work, but also an even more evident vital generosity, there must be in them a large spiritual treasure.

I am not well equipped to explore this world, Mischa managed to open a window for me. I remember a long talk in his appartment near the Avila[7], the magical mountain from our Caracas' memories, which is never the same, but always fascinating. He told me how he felt that a spirit -the one that spoke to Socrates?- inspired his mathematical life's work. I decided that I had to ask about these in a more systematic fashion. A couple years ago, I went to Buenos Aires, with the objective to talk to Mischa about his life and his philosophy of life. I heard him morning and afternoon for several days, I read and read again several of his writings about the meaning of the "cosas últimas", that he selected for me.

By then, reflections and readings about the fundamentals in the natural and social sciences had removed the wax from my ears. By the way, in the field of philosophical ideas, I am not and do not pretend to be Mischa's disciple. I was a witness, like many others, of his universal ethics practiced daily.

[7] Caracas sits at the foot of a mountain range, El Avila.

There was nothing in his attitude of equidistant indifference. He cultivated a profound love for diverse people and countries. I know what Argentina and Uruguay meant to him; I know how much he loved Venezuela, and how thankful he was for how warmly it embraced him. But his deepest convictions about the unity of the universe kept him away from any sort of nationalism or partisanship. "This empirical world of diversity and egotistic passions doesn't have an intrinsical reality", he said. "The idea of the diversity of human beings creates the illusion that the Other is another being [-], when the Other is oneself: everything that you do for the Other you do for yourself."

The spiritual intuition that scientific research and ethics have a common origin made Mischa fret in horror when science was used as an instrument for power and violence. In his last years, despite the fact that he suffered because of Yanny's sickness and his own, he did not stop in his project to build a "Center for the Unity of Science and Ethics". He was a "maestro", all his life.

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Translated by Cristina Pereyra who thanks Reuben Hersh for smoothing out the translation. Footnotes are by the translator not by the author.

Sep 27, 2007