

LEOPOLDO NACHBIN:
SOME PERSONAL RECOLLECTIONS

Francisco Antonio DORIA

Everybody who knew Leopoldo Nachbin would sooner or later call him just Leopoldo. So when I refer to him here I will always say like that, Leopoldo.

First, a short bio. Leopoldo was born in Recife (Brazil) in 1922 and died of a heart condition in Rio (Brazil) in 1993. He once described me his father, Jacob Nachbin, as a kind of rabbi who had belonged to the left wing of the Zionist movement. That description turned out to be an understatement, as Jacob Nachbin was a mainly self-taught intellectual with a very adventurous life; let me just mention that nobody knows for certain the date of his death, as he simply vanished during the Spanish Civil War, where he had been fighting against Franco. Leopoldo was educated by his mother, Lea Drechsler Nachbin, as Jacob Nachbin had left his wife a few years after Leopoldo's birth. He received a B.S. in civil engineering from the University of Brazil (now Federal University at Rio de Janeiro) in 1943 and a *Privatdozentur* plus a Ph.D. in mathematics in 1948 from the same university. He then started his international career, with temporary positions all over the world: he visited the University of Chicago, the Institute for Advanced Study, UCLA, Brandeis University, the Sorbonne, among several others. In 1964 he became a full professor at the Department of Mathematics, The University of Rochester, where he was offered the specially created George Eastman Professorship in 1965. He retired as George Eastman Professor, Emeritus, in 1992.

Leopoldo is best known for his contributions to functional analysis, but he started his scientific career with several papers whose consequences to logic and set theory are only now being explored. He did some very important research on the characterization of Boolean algebras, when he proved a kind of converse to Stone's prime ideal theorem for Boolean algebras. Complete Boolean algebras also appear in his proof of the extended vector Hahn-Banach theorem, while results from his book *Topology and Order* may bear on set-theoretic forcing. One must also recall that Leopoldo was a good friend of Newton da Costa, and therefore helped in developing mathematical logic in Brazil.

I first met Leopoldo in 1970. I was then a junior graduate student at the Brazilian Center for Physical Research, and Leopoldo was going to give a talk on his latest findings about infinite-dimensional holomorphy. There used to be a tea before every colloquium, and I approached him during the tea as one would approach a demigod. I believe I even had a trembling voice when I asked him whether it would be worthwhile to attend his talk, as I knew very little about complex functions. He then gave me his first lesson: go there, he said; I always try to talk to the widest audience possible. "There is no point in giving a talk just to a small bunch of specialists, as one must interest everybody in every aspect of science." Later he made a comment that clarified that remark: "I believe it is my duty to advance as much as possible Brazilian science, and Brazilian mathematics. That's not easy, and I have suffered many misunderstandings because of my actions in the interest of our science."

In 1973 I was going to pass my master's thesis in physics. As it dealt with a topic in mathematical physics, my advisor, Adel da Silveira, invited Leopoldo to participate in the examination committee, which he did. At the end of the oral exam he invited me to go to Rochester to obtain a Ph.D. in mathematics or in mathematical physics. I accepted on spot, but couldn't make it on personal reasons. He then accepted to be my Ph.D. advisor at the Brazilian Center for Physical Research, where I got my doctorate in 1977. In late 1979 I was at the University of Rochester as a junior research fellow under Leopoldo's sponsorship.

We became close friends. I mean, very close friends. He would go to my apartment any time during his stay at Rochester (he used to be there from September to December, every year, sponsored by the George Eastman chair he held); mostly unannounced. We had very little furniture, and so he would sit on the floor, sometimes even lie down while watching television or while sipping wine. There is an anecdote on the wine: at a friend's suggestion I once bought a few bottles of a very light and sweet German white wine, a *spätlese* wine, Sylvaner. Leopoldo asked me whether I liked it, and I answered, yes. "Where do you get it?" I gave him the address of the liquor store, or, perhaps, we went there together. A few days later, when I tried to buy a bottle of Sylvaner at the same store, the owner told me that there were none. "But you had lots of them a few days ago." "Yes, but that smiling fat friend of yours came over here and bought my whole stock." And the next day, when Leopoldo came on one of his regular visits, he was carrying a bottle of Sylvaner. We drank Leopoldo's Sylvaners for the rest of his stay at Rochester.

Once he asked my wife whether she could prepare a Brazilian-style *feijoada* (a kind of casserole with black beans, sausage, bacon and smoked pork). We prepared it for him but a few minutes before Leopoldo's arrival

we got a phone call from Brazil —my father, who had been ill for a long time, had just passed away. Leopoldo saw our distressed faces upon his arrival and had the kindest comment possible in such a situation: “I knew your father and liked him very much. I will be a father for you.” (He also used to tell me that once his student, always his student.)

In 1985, after a personal crisis, I had stopped doing math for several months. My interest was reawakened by a remark of my wife’s on the similarity between some early Brazilian rock art and catastrophe-like caustics. I then sketched a note (with Maria Beltrão and my wife Margot Doria) where those catastrophes were shown to be a possibility in neural nets, which might conceivably occur in the visual cortex. I sent Leopoldo a copy of it, and went to his office at the Brazilian Center for Physical Research to hear his comments. I can very vividly recall the scene: I stood in front of his desk for about one hour while he dressed me down. “I expected much more from you; this is trash,” was his kindest comment. (It wasn’t trash; on the contrary, it was a very good idea which related two distant areas, rock art classifications and neural nets. But I always deferred to Leopoldo.) I had long known him, so I waited until his outpour ceased for a few instants, and then said to him, “you’re right, that’s trash; I will never be a mathematician like you. Yet there is a very slight chance I will be able to do something of interest in geometry. It’s a very very slight chance, I know, but let me try it. I propose a bet: give me ten years. If I succeed in doing something of interest, you’ll give me a bottle of Sylvaner. If not, I’ll give it to you. We’ll drink it together, anyway. Do you take it?”

“I do, he answered. But that’s unfair. I love you [in Portuguese: *gosto muito de você*] and I hate to lose bets. And I’ll have to lose that one.”

Two days later he sent me as a gift the book where I found Hirsch’s decision problem for chaotic dynamical systems. Leopoldo lost the bet, as Newton da Costa and I solved Hirsch’s problem in 1990.