

A Finnish Student in California in the 50's Personal Recollections

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The period I spent as a young student in America in the 50's has been of great importance for my career and life in general. I know that the same is true of many scientists of my generation in Finland, probably also elsewhere in western Europe. In this article I will tell about some happenings in 1955–57.

Prologue: Is it worthwhile and possible?

The cultural atmosphere in Finland after the war was very different from what it is now. Most scientific contacts had been with Germany and Scandinavia, occasional ones with France and England. Studies abroad were not encouraged in general. My friend, a physicist had his Ph.D. in Oxford and was recommended to get another one in Finland, in order to safeguard his career.

I had my Master's degree in mathematics and philosophy and was interested in mathematical logic. I knew some names of people positioned in America: Gödel, Rosser, Tarski, Church. The advice I got from senior people was very discouraging. *There is only sports and pop music in American universities. Nothing to learn for you.* Besides, going abroad was not so easy those days. There were strict regulations concerning visas and currency. For a trip abroad, one could change only a very small amount of Finnish currency.

But there was a way out. Finland was the only country which had regularly paid its debts to United States after the First World War, and through

the Second World War still continued paying. This won Finland enormous goodwill, as it became known as "the country that pays its debts", a nation that fulfills its responsibilities without reneging. In recognition of this, the U.S. Congress decided to reinvest the loan repayments in academic exchanges, creating opportunities for Finnish citizens to study, train, and conduct research in the United States. The name of the program ASLA is an abbreviation of the Finnish expression for "grant based on American loan to Finland". Twenty such ASLA grants were available yearly for graduate students in all fields, including art and sports. My sister had had a grant in 1950–51 and was most encouraging.

The competition was tough. But I made it and was chosen by the Finnish committee. I had an excellent study record and good recommendation letters. I also got a high grade in the language examination although I had not had English at school.

I was chosen by the Finnish committee but it was emphasized that the matter was not yet clear. The final decision was by the Institute of International Education, IIE, in the United States. There were still some interviews, numerous forms to fill out and, most importantly, a careful medical examination. The latter could be made only by one specific doctor in Helsinki. After visiting him, I still had to send information about my family and an X-ray picture of a specified size. That particular size could not be made in my home town Turku, so I mailed a somewhat bigger picture. The aforementioned doctor was friendly enough to call me and tell that my application would probably be rejected unless I provide an X-ray picture of the correct size. So I made another trip to Helsinki to get it. It surely was worthwhile. So was providing all the required information about my parents and grandparents and their eventual communist activities. The influence of McCarthy was still strong in mid-50's. *One must drive the reds out of television, radio and Hollywood!*

It was required to have three possibilities for your university. University of California, Berkeley, was one of my choices. In June 1956, after an application process of nine months, I got a letter telling that IIE had accepted my application. The university would be Berkeley.

Traveling and orientation

Travel was included in the grant. Our group of twenty graduate students started from Helsinki airport on Friday, June 13, 1956. It was a media

event covered in all newspapers. The flight was only to Stockholm, then the night train to Gothenburg, and from there the Swedish American Line ship *Stockholm* to New York. The price of the eight-day luxury voyage was then only half of the air fare. On her way back to Europe *Stockholm* collided with the Italian *Andrea Doria*. The accident caused unnecessary worries in my family in Finland because the news reports were not very specific about the matter. On the other hand, means of communication other than an airmail letter were unthinkably expensive. During my stay in America there was not a single phone call between me and someone in Finland.

The Institute of International Education had arranged an almost minute to minute program for us during our three days in New York: sightseeing, Radio City Music Hall, meeting socialites in high-rise buildings along Central Park. Our group was then divided and sent to small colleges for orientation. I landed with four other Finnish students to Bard College, Annandale-on-Hudson.

The attitude in the six-week orientation course was quite reverse to what I had experienced in Finland. In some sense we were *underdeveloped* and contrasted with *clever Americans*. Many of the lectures had absolutely no meaning or use for us. On the other hand, teachers were friendly and the school hospitable. Extra-curricula activities, such as a visit to the IBM laboratory, were arranged. The most memorable event for me was the trip to the famous Tanglewood Music Festival, where young Leonard Bernstein conducted Mozart's Great Mass in c-minor.

Settling down in Berkeley

After a long train ride across the continent I arrived in Berkeley on September 2. The institute IIE had recommended room and board in the International House of the university. However, it would have almost exhausted my grant, \$ 175 monthly. I decided to look for other alternatives. I checked in a cheap hotel, \$ 2.50 per night, and walked around the gorgeous university campus. It was Sunday, outside a building quite far from the campus I heard many elderly people talking what sounded Finnish. Indeed it was. I introduced myself and got to know some of the 9000 Finns living in the San Francisco Bay area. They were very friendly. Later on they were very hospitable. I got many free meals and even a weekly sauna that was very important for me.

The next day I looked for rooms for rent in the housing office of the university. There was a huge number of them. I noticed a Finnish name *Toini Jokitalo*. At once I walked to her small house, a distance of five kilometers went fast, I was in good shape. I got a nice room and breakfast for a low price. She was an elderly lady, came to America in 1912 and had overlived three husbands. I enjoyed living in her house. She was very caring and friendly and still went to work early every morning.

The registration process to the university lasted several days and included also detailed medical examinations. I took several courses in mathematics and philosophy. From the very beginning I noticed that people really studied hard. The big reading room of the library was full until 11 p.m. There was nothing resembling the radical movements and student unrest of the following decade.

I will now present some glimpses of my studies in Berkeley

John Myhill and automata studies

John Myhill was in his early thirties and had chosen the Princeton University red-cover book *Automata Studies* for his seminar. This was my first acquaintance with finite automata and regular languages. Myhill gave also some lectures himself. He was very impressive, to say the least. But he was also in some sense out of this world, and his behaviour could be very irregular. Once he did not show up in the lecture room. We waited but finally went looking for him. He was lecturing in a wrong room. The blackboard was already full, and Myhill had apparently not noticed that there was no audience. Myhill's speech was not easy to understand, at least not for me. It was referred to as the "Birmingham accent". Indeed, he was born in Birmingham, England. My work in his seminar, carried out with Howard Jackson, was about self-reproducing automata. The automata worked in the plane, where necessary components, such as power supplies, were randomly scattered around. The final construction was quite detailed, with some 30 states and instructions for each specific configuration, a welding operation and so forth. Myhill was quite pleased and started to talk about publication. But he had his good days and bad days. The day when we were supposed to talk about the details of the publication happened to be a bad one, and so nothing came ever out of the matter.

No lecture notes were available for the seminar. However, later in 1957 Myhill published notes "Theorems on the Representation of Events" that

became available also as a technical report. To see how things were viewed those days, I quote here a passage from the beginning of the notes.

The type of automata we shall consider are exemplified by combination locks, cash registers, digital computers. These automata have the following properties: they are capable of a certain finite number of states (both the internal mechanism and the input and output): these states are discrete (i.e. the automaton passes abruptly from one state into another): what state the machine is in at any time depends only on its state immediately before and upon the immediately preceding input.

Many of the early papers in automata theory were sponsored by programs of U.S. Air Force or U.S. Office of Naval Research. Myhill's seminal paper on linear-bounded automata was reviewed by L. M. Butsch, Jr., a major in the USAF, as follows:

The content of this report represents the scientific findings of an Air Force sponsored program. It does not direct any specific application thereof. The report is approved for publication to achieve an exchange and stimulation of ideas.

Alfred Tarski and logic

I had mentioned Berkeley in my grant application because of the fame of Tarski. He was not very friendly when I went to his office. But when I said that I had done something with G. von Wright in Finland, he said that I would be all right. When I asked about his seminar, he said that *seminar is a group of people gathered to work together*. He was always wearing elegant suits and chain smoked Winston cigarettes, also during his lectures.

The topic of the seminar was infinitely long formulas in logic, and related matters. Because of my insufficient background, much of the material was beyond my understanding. Many of the people attending were already then or later famous: Leon Henkin, Roger Lyndon, Robert McNaughton, Robert Vaught, Carol Karp, Donald Monk. No wonder Tarski said that this had been the best seminar in his life because we had been "really learning something".

Tarski sometimes spoke of his Polish colleague Adolf Lindenbaum who died young as a victim of "organized totalitarian barbarism". Tarski's original name was Tajtelbaum. He had moved from Poland to America. Very often Tarski spoke of scientific results having been independently discovered by two or more people. I got the feeling that Tarski had also in mind his own work on the concept of truth in formalized languages. It bears similarities with Gödel's work on formalized languages but never rose to an equal fame.

There were monthly logic seminars between Berkeley and Stanford. In the evening participants, including students like me, were invited to Tarski's house, a beautiful location on Berkeley Hills overlooking San Francisco Bay. Remembering the aristocratic Finnish professors who kept distance to students, I was surprised to see that there were no such borderlines in America. In one of Tarski's parties Leon Henkin asked me to join him in a concert of Louis Armstrong, which I did with pleasure.

I also took Tarski's course on foundations of geometry. Tarski said that he likes to do experiments in his courses, which he surely did. Tarski wrote later a monograph with Wanda Szmielew, based much on the material of the course.

I had the possibility of extending my grant beyond one year and becoming Tarski's doctoral student. I had several reasons for reaching a negative decision in this matter. Basically I wanted to live my life in Finland. As a Ph.D. advisor Tarski was very unpredictable. After solving one problem he had given, you never knew how many further problems he would give. It was unsure that a Berkeley Ph.D. would be recognized in Finland those days. The girl who is still my wife would certainly not wait for me that long...

Many-valued logic. Romanian connections. Finnish language

Apart from Myhill and Tarski, I took courses from many other people. In a course about philosophy of science I worked on many-valued logic, where truth and falsity are not the only truth values. In addition to philosophical issues, the area offers an abundance of mathematical problems. I studied the literature and continued this work whenever I had time.

In the excellent Berkeley library I found the papers of *Gr.C. Moisil* about "non-Chrysippian logic", as he called the area. Most of them were in Romanian but still easy for me to read because of my background in Latin. I corresponded with Moisil and met him a few years later. This was the

beginning of my numerous connections with Romanian scientists which have been very important for me.

Eventually, in 1960, I got my Ph.D. in Finland about many-valued logic, without any specific advisor. Automata theory would have been much too esoteric as a Ph.D. topic in Finland in the 50's.

I already told about my numerous Finnish acquaintances and friends in Berkeley. It was surprising that my knowledge of Finnish was useful also in academic circles. The head of the linguistic laboratory was Sydney Lamb who later became very famous. The purpose of the laboratory was to train advanced students for work among American Indians. Lamb wanted to analyze Finnish: phonology, grammar, etc. I became their informant, and was interviewed by the group twice a week. Sometimes, remembering my school grammar, after saying something I added that actually it should be said a bit differently. Lamb commented that a linguist is always interested in how it is actually said, not how it should be said.

I had some discussions with the famous Hungarian mathematician György Pólya, not about mathematics but about Finnish. Hungarian and Finnish belong to the same family outside Indo-European languages. However, the vocabularies are quite different. Pólya knew some Finnish and pointed out the similarity of basic words such as "water", "blood", "fish" in the two languages.

Important and decisive period in my life

My stay in America turned out to be decisive for my career. The areas of science I got acquainted with were largely unknown in Europe. This gave me a definite advantage. Also otherwise my stay in America was memorable. Natural wonders such as Yellowstone and Yosemite with giant trees were beyond comparison. Never later have I been attending great operas and concerts to the same extent. There were cheap tickets for students in the standing area in San Francisco Opera. The singers I heard included Björling, Warren, Tebaldi, Albanese, Schwartzkopf, and the instrumentalists Gould, Rubinstein, Joyce, Heifetz, Menuhin, Pjatigorsky. Karajan and Szell were among the conductors. This all I remembered when sailing back aboard *Stockholm* in September 1957.



