

Copyright Notice

The following manuscript

EWD 584: Tripreport E.W.Dijkstra, Poland and USSR, 4–25 September 1976

is held in copyright by Springer-Verlag New York.

The manuscript was published as pages 235–244 of

Edsger W. Dijkstra, *Selected Writings on Computing: A Personal Perspective*, Springer-Verlag, 1982. ISBN 0-387-90652-5.

**Reproduced with permission from Springer-Verlag New York.
Any further reproduction is strictly prohibited.**

Tripreport E.W.Dijkstra, Poland and USSR, 4-25 September 1976.

Because I had to check in at Schiphol Airport at seven o'clock in the morning. I went to Amsterdam the previous evening and slept in Hotel Frommer quite near to the airport. As the courtesy coach leaving the hotel at 6.30 was my target, I set my alarmclock at 5.45. When I entered the breakfast room at 6.00, however, I knew with devastating certainty that half an hour later we would have transport problems. I decided to be one of the first arriving at the coach, finished my breakfast quickly --which was no problem, for it was of sub-airline quality-- and made for the coach. Some time later I had the satisfaction of observing that my prediction had been correct. The Lufthansa flight to Warsaw --with a stop in Frankfurt-- was smooth and pleasant; besides that I was served a breakfast distinctly better than the one I had just discarded.

In Warsaw I had my first confrontation with totalitarian bureaucracy: it took me more than one hour to pass customs and immigration. As soon as I had left the official area, I was greeted by dr. Ian Madey, who was quite surprised to see me: he was waiting for someone else. (As he is about the only Pole I know, I had assumed that he had been sent out to collect me.) The process of collecting arriving participants was of a refreshing informality. (Later I understood why: these Symposia on the Mathematical Foundations of Computing Science are visited yearly by a very inbred crowd: everybody knows everybody!) With my host, prof. Antoni Mazurkiewicz, and two others, I had an improvised lunch in Madey's apartment that was quite close. Half past three we joined a coach that had collected participants from Warswa Airport and Warsaw Central Station, and then we were on our way to Gdansk, where we arrived at 22.45. After a late supper I stumbled into my bed: seven hours in a coach --on Polish roads and seemingly without shockabsorbers-- is no fun.

The trip, although tiring, was interesting. It confirmed the impression I had received while looking down from the plane: every square inch of Polish soil is cultivated if possible. As we approached Gdansk the many little farmhouses were gradually replaced by fewer larger farms. The explanation is probably to be found in the time that Gdansk was still Danzig and export of grain enabled the farmers to become richer, the closer they were to the export harbour.

It is quite clearly still a poor country, even thirty years after the war. Ian Madey's apartment was well-kept and well-furnished --most of it pre-war furniture, I thought-- but small. Private cars are a rare commodity, a private car in a reliable condition seems exceptional: during that coach trip I saw at least ten cars stuck with mechanical trouble. Mazurkiewicz, who made the trip from Warsaw to Gdansk in his old Volkswagen, told me in Gdansk that half-way he had had to extinguish a fire in his car, and four days later he had not been able yet to have got it repaired. The dinners at NOVOTEL were of a depressing tasteless monotonicity, at breakfast a single cup of coffe was the only fluid served, for a second cup one had to pay. The NOVOTEL building, however, was new and comfortable; it seemed an exact copy of the other hotels of the French (!) NOVOTEL chain.

It was quite clear that among the people I met, "the system" has very little sympathy, but they seem to have discovered a way not to suffer from it too much. It seems to be accepted as one of those unavoidable things --more or less like a climate-- , they made the impression of being reasonably happy in spite of it all. The Polish sense of Humour is in any case exquisite.

The Symposium was one where I --although an invited speaker-- did not really

belong. (I would not have accepted the invitation, hadn't it been for the fact that I could drop by on my way to Moscow.) I was immediately invited to act as session chairman on the first Monday morning, which, of course, meant that I could not escape. After lunch I was still so tired after Sunday's travels that I went to my room for a little nap. I fell asleep and missed most of the afternoon's talks, but all people I have asked have assured me that I had not missed much.

I was Tuesday morning's first speaker. On the previous evening there had been a reception; because I felt that I might have to address a hundred hangovers, I made a special effort of it. The conference proceedings had been handed out on Sunday evening. It contained the text I had prepared which --being perfectly readable by itself-- had already been read by many participants. It seemed silly to read that text aloud, so I gave a completely new talk under the title "Back to Nature, or Two Cheers for Simplicity." It went well. The end was totally new for a large fraction of the audience, because I ended up with the development of a little program, and many of them seemed never to have seen a program in their whole life.

This was the shortcoming of the whole symposium. There was a minority of computing scientist and a majority of mathematicians who really believed --or at least: behaved as if-- that they could contribute anything relevant to the mathematical foundations of computing science without knowing enough about the latter subject. (A Flemish speaker demonstrated his unfamiliarity in a way that amused me very much. After having seen me as session chairman on Monday, as invited speaker on Tuesday, he discovered in my presence on Wednesday morning to his surprise that I was Dutch. After a few words of Dutch we switched back to English because others were present; he then asked me the polite --at least: politely intended-- question "What is your area?" I could not resist the temptation to answer "Computing Science".) Years ago the power of the Polish mathematical and logical establishment and its tendency to strangle computing science had already been explained to me, so I was not too surprised when one of the organizers told me that they hoped to have established themselves to such an extent --this was their 5th Symposium-- that next year automata theory could be deported to a separate symposium. I hope that they succeed, for they deserve to be freed from that form of pure mathematics that seems more like a bureaucracy: a self-perpetuating activity, masochistically in love with its own, self-inflicted complexities.

I quote --because it is so typical-- the opening sentence of the Conclusions of one of the invited speakers (Wilfried Brauer, Hamburg: "W-Automata and their Languages."):

"The theory presented here may help to solve some more known problems; it gives rise to quite a number of new questions and it offers several ways for future research:..."

Also de Bakker ran true to form. He proudly demonstrated a proof rule for the PASCAL procedure call without the restrictions on the parameters that Igarashi, London and Luckham had introduced. As his new proof rule has the consequence that one cannot prove the correctness of the procedure in isolation, but may in principle need different proofs for the different calls, any reasonable man would conclude that the Igarashi-London-Luckham restriction is such a wise one that we may speak of a flaw in the design of PASCAL. But de Bakker emphatically refused to draw that conclusion! (Without going into details, however, I would like to mention also, that I had reason to admire de Bakker's political courage.) Good talks were presented by Mazurkiewicz (Poland) and by Berthelot and Toucairol (France!). Nivat also arrived.

* * *

My departure from Poland was less successful. I had to fly all by myself from Gdansk to Warsaw, where I had to catch my connection to Moscow. The first flight was delayed and --knowing no Polish-- I found it hard to discover how long the delay would be. The distance between the airports of arrival and departure in Warsaw was --fortunately!-- small. The transfer was not pleasant, because the man from the Polish Academy of Sciences that picked me up did not seem to like that job at all. After I had checked in and had passed emigration, I came into a real chaos when we had to guide our own luggage through customs. I nearly lost my balance and luggage in a pushing crowd of a few hundred Poles. Embarkation time was approaching and just when I was wondering for the tenth time whether I would get through in time, the baggage handlers of the airport solved the problem by placing all the unchecked luggage on the belt. I was then pushed into the departure hall, from there through a gate --that neither mentioned Moscow, nor my flight number-- a very stern and cross lady --well, lady...-- at the gate tore my boarding pass into two, from there I was pushed into a coach and from there into a LOT airplane. We took off before the scheduled departure time, but when the announced flying time did not seem to be correct either, I suddenly got alarmed, wondering whether I was flying to, say, Bukarest! I was greatly relieved when a stewardess could confirm that I was, indeed, on my way to Moscow. It was my first flight on a Tupolev and it was a very pleasant one. Disembarkation again had more resemblance to cattle being driven out of a wagon. As I had no Moscow address of my host, nor a telephone number --only Andrej Ershov's promise that he would meet me at the airport-- , I was greatly relieved to see him before I had passed customs and financial formalities: the officer spoke English and was courteous and helpful. After my Polish experiences this was a pleasant change; later I would learn that inside the USSR such courtesy also seemed very rare.

I was met by Andrej Ershov and Sergej Pokrovskii from the Computer Center in Novosibirsk --they would accompany us on the whole trip-- and an older colleague from Moscow who drove us in his new, first car --only 800 km done-- to the Hotel of the Sovjet Academy of Sciences. The driver's uncontrolled way of changing lanes made the trip a nerve-racking experience; before his new car is 1000 km. older I am sure that he will have had an accident.

Then our grand tour started. After two days, Tony Hoare from Belfast joined us (on Saturday evening). On Monday night we went from Moscow to Kiev, on Thursday night we went from Kiev to Leningrad, on Sunday night we went by train from Leningrad to Moscow and from there by plane to Novosibirsk, where we performed for the next two days. On Thursday morning we left Novosibirsk; Tony stayed a further day in Moscow, I left Moscow on Thursday evening for Amsterdam (again via Frankfurt) where I arrived at a quarter to eleven in the evening, pleasantly surprised to find my wife with the car at the airport: instead of another night in a hotel, we drove back to Nuenen and arrived home at a quarter to one in the middle of the night. I just dropped into bed, slept until ten o'clock next morning; taking a real hot bath, I realized that I still saw memories of mosques, icons, cots in the mud and policemen, yeah, policemen everywhere: they still haunted my memory....

The general pattern of our visits to those four towns was a lecture by Tony, a lecture by me, a public performance of both of us for a large audience, one or two "scientific discussions" and an official dinner --with vodka, caviar and toasts-- with our hosts. We have worked hard: our lectures were between two and three --mostly three-- hours. Andrej had counted the number of our performances and had added the audience sizes. On our last day, when visiting prof. Marchuk, the Director of the Siberian Branch of the Sovjet Academy of Sciences, he proudly reported that in seventeen meetings we had addressed over 2500 people. Under normal circumstances that kind of quantitative reporting would have amazed me, but this time I just noticed it, for it was exactly what in the meantime I had learned

to expect. (This is what one expects in a society that tries to leave the Middle Ages by means of five-year plans; I was not surprised at all to observe Marchuk swallowing these numerical data as if they were highly relevant.) All our lectures went very well. (Only at the beginning of my first talk panic seized me: standing in front of a fully packed auditorium with two blackboards I discovered that with the Sovjet chalk I couldn't write on them! After a delay of a few minutes someone had liberated two miserable pieces of chalk that were slightly better. It was with grim satisfaction when, a week later in Leningrad, I saw a Russian wrestling with the same problem.) It was my first experience with addressing an audience via intermittent translation; when Andrej did it --and that was nearly always-- it worked beautifully. He often seemed to enjoy it, he was clearly much more than just an interpreter. (In Kiev I started with "just an interpreter", but within five minutes Andrej took his place.)

Our "scientific discussions" were more difficult. On the first Saturday morning I had such a discussion all by myself, because Tony had not arrived yet. We had chosen "computer science education" as its central theme because I wanted to check a remark in a recent advice to the US Government, viz. that in the USSR programming was taken very seriously and was primarily done by people with a solid mathematical background. I found that remark confirmed. The only difficult moment during that discussion was when my opinion about mechanical verification and further Artificial Intelligence work was asked. It was a difficult moment, for I had already discovered many years ago that the amount of support for AI-projects in particular says less about the intrinsic merits of these projects but much more about the political climate that supports them. Suddenly Andrej needed twice as much Russian to translate me. Twice we have had a discussion about one of their microprocessor projects, but that was nearly impossible. It reminded me of my discussion at IBM Hursley in the early seventies, shortly after at the THINK-notices had been replaced by warnings to keep company-confidential matters secret, and the IBM-er who wanted my advice got, just when I arrived, a telephone call reminding him that he was not allowed to tell me anything, not even to formulate his question. In the USSR it was the same crazy game of hide-and-seek. How can you comment on something when they don't tell you what to comment on? They either feigned not to understand the question or gave a null-answer --"This will depend on the circumstances." etc.-- Eventually we extracted that they proposed a tree-like "store-and-forward" communications network of about one hundred microprocessors, each with its own clock of about 30 MHz. (When I asked the clock frequency, a long discussion in Russian started: Tony, who speaks Russian, told me later that they were discussing among themselves whether they were allowed to answer my question.) I told them that I did not expect that it would work, because I expected glitches all over the place. They then started to explain why they were sure that that would not be the case. From that explanation I got a strong impression that they hardly understood the phenomenon, but I felt no longer tempted to give further explanations.

It is undoubtedly true that I observed a strongly mathematical approach to computing science, but it seemed to me to be mathematics of the wrong kind. Very pompous, with Roman, Greek and Gothic alphabets --Andrej complained about the "indexomania" in his country-- and void of any simplicity or elegance. A "machine" is at least a ten-tuple. and all their work seems soaked with more and more elaborate computational models. I remember the man who proudly told us that his computational model distinguished between no fewer than five (!) different kinds of store. In short, it seems all highly ineffective. I got two explicit indications, that mathematical elegance is not regarded as very important (a decadent capitalistic luxury?). It will take a long time before they will discover that in computing science, elegance is not a dispensable luxury, but a matter of life and death.

I was surprised by the susceptibility --or should I say: vulnerability?-- to foreign (primarily American) influences. Jack T Schwarz was touring the USSR for the n-th time in order to keep the Russians up to date on the latest developments of SETL. (Was this part of some sort of Helsinki treaty between the USA and the USSR?) On the one hand I know that many people have grave doubts about the whole SETL-project (and I know some of the reasons), on the other hand it was strange --nearly alarming-- to see that in the USSR Schwarz was taken absolutely seriously. In Leningrad I discovered that they had been misguided enough to invest God knows how much in an implementation of ... ALGOL 68 for the Russian 360! In Novosibirsk a group had recently embarked on automatic program verification etc., very much in the line of London c.s. , without any tangible justification for the hope that they should do any better. During our lunch with Marchuk, the latter asked our comments after he had explained why computing science in his opinion was such an important field, and explanation that was no more than a reiteration of the Artificial Intelligence hopes! (John McCarthy, too, is a regular guest in Novosibirsk.) I could only comment by quoting George Polya, that infallible rules of discovery would work magic, but that there is no such thing as magic. (Under such circumstances, quotations are very useful: they enable one to give unwelcome answers without being rude.)

Tony gave a very plausible explanation: no matter how doubtful they are, they just cannot afford to leave a Western exercise unexplored, for suppose that those capitalists book a significant result! I think that that explanation is correct. It seems in full accordance with Andrej's attitude, which is one of extreme tolerance, combined with a tendency to collect a wide variety of documents. (The size of his personal library in the institute was most impressive.)

The departure from Moscow was again a chaotic affair: I was taken to the airport by a young Russian who spoke some English but was unable to explain to me how I should proceed and what formalities I had to go through in what order. I flew back in a Lufthansa plane, mainly filled with Germans who had had a trade exhibition. The tension began already to discharge at the gate: still three policemen to pass and we shall be free again... There was a clear sigh of relief when the plane took off.

* * *

Some random remarks.

My first impression of Poland in the evening was that it was extremely well --not to say: over-brightly-- illuminated, and I thought "They must be very concerned about the well-being of the average citizen to light his path so well." On closer inspection the illumination was always on parking lots, timber yards and the like. It was clearly a protection against theft and my Sportstourist guide that saw me off to my plane to Warsaw did not make a secret of this fact. In the USSR the same bright illumination; in Moscow I even saw that most cars were parked with their wiper blades removed (and even little plastic covers on the arm tips). When my guide showed me a row of parked cars and said proudly "All Sovjet-made." I could not resist the temptation to ask maliciously, whether the wiper blades had been removed as a protection against theft. Answer: "I don't know; I don't have a car." After having verified my conjecture I told him later that day not to behave like a bloody fool. He took the hint and was, from that moment onwards, quite honest. He was not a party member, although (nearly pathologically) nationalistic. I had already observed this, he himself had observed that trait as well. He confessed this with a very curious mixture of pride and shame. Later he told me that --although he had had ample exposure to Frenchmen and Americans-- this was his first confrontation with "northern Western Europe" (i.e. Tony and me).

He had been afraid and had found the first few days very difficult. (The fact that Tony and I knew each other so well was, of course, an added difficulty.) The next time I go there --I am not sure at all whether there will be a next time: an invitation for next year has been declined without the slightest hesitation!-- I shall take, say, a fresh Herald Tribune and Le Monde and Times with me: our guide was absolutely thrilled when he found in the Intourist Hotel in Leningrad a six-day old copy of Le Monde in the shop: he immediately bought it and said to me "I would never have believed that possible."

* * *

A few remarks about "the sociology of science" or "how to make a career". A young mathematician who lectures in Poland on EOL's and ETOL's etc. told me his motives for entering automata theory. He did not particularly like the subject, nor had he any belief in its relevance. But he found the subject easy, had observed relatively little competition and in his country he could earn a living with it because the university authorities confused it with computing science anyhow. At first I was shocked by his cynicism --he was a young man with most of his life still before him-- at second thought I found it harder to blame him: he was perfectly honest about it and I could only pity him for having so few illusions (although, of course, this may save him some disappointments).

Next I observed a systematic application of the saying "In the land of the blind the one-eyed is king.". People try to make careers in computing science by frequenting in this respect underdeveloped countries and obscure conferences. I had seen a few of such cases in Western Europe, behind the iron curtain the phenomenon is very pronounced: it was sometimes embarrassing to hear which of my countrymen had frequented their places. And then the man who, later this fall, would go for a month to Singapore to lecture about Lindemayer systems! That must be just what they need...

* * *

A KLM purser told me the other day --or was it night? it was one of those circumstances under which one is never quite sure which is which-- a story about a cooperation agreement between KLM Royal Dutch Airlines and Aeroflot. In preparation of the cooperation nearly 30 KLM employees --among whom my purser-- learned Russian. My purser had been one of the first to serve on a flight with a mixed crew. As soon as the Sovjets, however, discovered that the Dutchmen they cooperated with understood Russian, the agreement was cancelled! It is frightening to observe such a large nation to be so nervous and so uncertain, but after my recent experiences over there I have no problem at all with believing my purser's story.

* * *

I have been shown many cathedrals and monasteries, in Leningrad mummifying caves in which an underground monastery had been built. It breathed the spiritual atmosphere of the Dark Middle Ages, but that underground monastery had had its heyday in the eighteenth century. It was crowded with mostly Russian tourists, at the exit was the Marx quotation about religion and opium, and a nearby church was now a Museum for Religion and Atheism. They have very mixed and ambiguous feelings towards religion, also cramped. After a week Sergej asked me, whether I was a Christian; what else could I do than asking him whether he was a Communist? (We both answered "No.") I found that cramped attitude towards religion irritating and even a little bit sickening. Of antisemitism, I am happy to say, I have personally observed nothing. This in strong contrast to Hungary in 1968, where I found the open antisemitism appalling.

* * *

Like a good boy I had decided to write my wife a long letter from each of the towns I would visit. So I wrote her a letter from Gdansk, a letter from Moscow and a letter from Kiev, but then I heard that they would take at least ten days to arrive, because they would be opened and that, apparently, is a time-consuming process. (Upon my return I could verify that both rumours were indeed correct: they had taken ten days to arrive and they had been opened! The shocking thing was that they were not stamped "Opened by censor", on the contrary: they had been opened and reclosed carefully, but I had taken a few precautions and it was absolutely certain that at least one of the Russian letters indeed had been opened! I had written them in the kind of double-talk, with which no Russian censor could find anything at fault, at the same time certain that my wife would understand.)

In Leningrad I realized that writing letters would not make much sense anymore, so I ordered a telephone call for Saturday evening between 21.00 and 22.00. I was in my hotelroom all the time, waiting, but nothing happened. So next morning I sent a telegram. The girl at the counter was cross, maybe because the price of the telegram was something like her weekly wage. The text is a true reflection of how I felt:

dear ria heard my letters from moscow and kiev not expected to arrive before my return telefont effort from leningrad failed hence cable saying still alive bowels reasonable eyesight good trip tiring interesting and depressing talks went like clockwork and very well received hotst as pleasant as they can be guided tours past historical buildings closest approximation of hell imaginable thank heaven tony is here sunday morning working together kiss children also yours longing to be home edsger

It seemed a reasonable way to spend my rubles!

* * *

I did my best to behave as one should in bugged rooms, but I found it difficult. I remember that, when I asked the IBM-er in Hursley whether the room in which he received me, was bugged, the IBM-er orally protested "No, of course not." while nodding affirmatively. Similar situation while I paid my compliments to the Dutch ambassador in Moscow. I remembered never to comment on our Russian hosts but when, in Moscow in my hotelroom I started to explain to Tony the type of computer architecture I had been thinking about lately, better trained than I Tony immediately suggested a walk. It did not rain and we walked for nearly two hours. It took Tony a long time to grasp the idea, so it might be a little bit revolutionary. Eventually he got quite excited, but agreed that several critical issues have to be investigated rather carefully, before the idea can be proposed as a realistic one. Then we returned to the hotel and went to bed.

* * *

To fill the page a quotation from my diary (Leningrad):

"Friday was a tiring day for me. Morning lecture of three-and-a-half hour (fifteen minutes break included). Well-prepared talk on the importance of nonoperational definition of programming language semantics went like clockwork. (First time I gave that talk.) In the afternoon we were exhibited for an audience of about 400 people in the University auditorium, together with Jack Schwarz, who was selling SETL. Schwarz's "position statement" contained expressions such as "...a large mess of structure..." and "automatic choice". When later confronted with these quotations he answered "crudity is the characteristic of language". Speak for yourself, Sir! But if that is his attitude, my revulsion fully explained."

16th October 1976

NUENEN - 4565

Plataanstraat 5

prof.dr.Edsger W.Dijkstra

Burroughs Research Fellow