

Trip report E.W.Dijkstra, Mission Viejo, Santa Cruz, Austin, 29 July -
8 September 1979.

On the first half of this trip I was joined by my wife Ria, my daughter Femke, and my son Rutger; for the latter two it was their first visit to the U.S.A., for Ria it was the second visit to the USA, but the first one to California.

On Sunday morning 9.00 the four of us were ready for departure, but the taxi that should take us to the Eindhoven railway station did not show up. After some telephoning we learned that the taxi had gone out to collect --and wake up!-- the wrong Dijkstra. The timing of our schedule had been sufficiently pessimistic, and we caught the train we had planned to catch. When we arrived at Schiphol Airport we learned that there had been no reason for hurry or anxiety at all, as the KLM-flight to Chicago would be delayed by at least two hours (awaiting technical clearance). Eventually it became three hours; our schedule could not absorb that, and we missed our connection in Chicago. My main problem was that I did not know how to reach John McClintock, who had promised to collect us at Los Angeles International Airport. I asked KLM to send a message to the gate of United Airlines, where John expected us to arrive. When we did not show up, that message reached him after some ingenuity on his part, and after having waited another three hours at LAX he could finally collect us and drive us to our motel in Laguna Beach. His assistance was greatly appreciated, because I don't think that at that moment I would still have been able to learn how to drive an American car. All its niceties --power brake, power steering, electric windows, and (worst of all!) and automatic gear shift-- were explained to me the next morning after a long and untroubled sleep. That Monday was essentially devoted to recovery. On Tuesday the four of us went to Disneyland (not after all sorts of people had assured me that even I would like it); I liked some of the recommended items and admired the technique of controlling large crowds, but it is beyond me how anyone would ever like to go there a second time. On Wednesday my work at Burroughs started.

Because I had not been to that plant for a long time, they had a lot

to show me; these discussions took place in the morning. In the afternoons I addressed three different groups, largely composed of people that had been attracted since my previous visit. One evening we attended a reception given in our honour, the next evening we had a (delightful!) dinner at Erv Hauck's home. It was nice to see how the children could carry on a conversation in English and seemed to feel themselves quite happy.

On Saturday morning the four of us left Laguna Beach in the rented Oldsmobile Royale for our trip up North, a trip that became very nice as soon as we had passed Los Angeles. Only Femke did not enjoy it too much: she was sitting at the sunny side of the car most of the day and fell asleep. We did not hurry and drove that day up to San Luis Obispo, where Burroughs had made a reservation in an excellent motel. We arrived there late in the afternoon; Femke and I each wrote a letter before we went to (a terrible) dinner. On Sunday we went, mostly along the coast, to Santa Cruz: a lovely ride! It is quite mountainous and you shouldn't take it when you are in a hurry. Apparently most Americans were in a hurry that day, for the road was not crowded at all. As a simple courtesy to the organizers, a main speaker should never arrive late; hence we arrived in the course of the afternoon on the campus of the University of California at Santa Cruz, a campus where I would live --or, at least, try to do so-- for the next four weeks. (Week zero: a programming course, weeks one and two: The Summer Spectacular, and week three: a meeting of the IFIP Working Group 2.3 on "Programming Methodology".)

I found the UCSC campus not an inspiring place, and the longer I stayed there, the more depressing it became. The place seemed most successful in hiding all the usual symptoms of a seat of learning. In the four-person apartment we occupied, only one of the four desks had a reading lamp, and the chairs in front of the desks were so low that writing at the desks was not comfortable. Probably it doesn't matter. Can UCSC students write? Do they need to? The notice boards showed ads from typing services "Grammar and spelling corrected.". (One of these ads itself contained a spelling error!) Blackboards were hardly sufficient; there used to be neither bucket nor sponge; the acoustics were from bad to terrible; the PA systems in the large lecture hall and in the theatre were inadequate; I did not find a US post office on

the --very isolated-- campus; all campus maps were incomplete, in mutual disagreement and in disagreement with the campus itself; in the one and only public place where we could meet in the evening --"Idler's Cafe"-- conversation was impossible as the result of the summum of vulgarity: a row of noisy pin-ball machines! And --as I am told: even by dormitory standards-- the food was terrible. We had to share the food --and what was worse: also the space in which to consume it-- with the participants in other "educational" activities --such as a cheer-leaders school and a school of American football-- . There were musical instruments on the campus and there seemed to be even a Bösendorfer, kept behind a well-locked door; initially I was annoyed by the fact that access to it was denied to us, but the accessible Yamaha's were in such a terrible shape that within half a month I had developed a certain sympathy for the guy that protected the Bösendorfer against the prevailing misuse.... In short: the place breathed an atmosphere of uncivilization.

Upon arrival we were greeted by Wim Feijen, who had been invited to assist me during the next week, by Netty van Gasteren, who was officially just a student, but gave valuable assistance, by Gary Levin and Fred Schneider from Cornell University, who were to assist David Gries. Originally only David would give a five-day programming course during week zero, but David's course had been so heavily overbooked that Bill McKeeman had asked me whether I could run a parallel session. And so we did. Each evening the five or six of us would meet, collect and compare experiences and make a plan for the next day --a plan from which, invariably, both David and I would depart-- . But we kept our classes well enough in phase so that, on the last days, we could combine the troops a number of times in the larger lecture hall.

The audience was of a higher calibre than we had been led to expect on account of David's experience about five years ago, when he gave a similar course. At that time he had had a sizeable fraction that knew nothing beyond COBOL. This time it was much better: for each Ph.D., we had two Masters and three Bachelors. We had eight people from various Bell Laboratories, about twelve people with academic affiliations. The reasons for the rise in quality were not clear: its announcement may have been different, the fact that it was presented as a technical introduction to The Summer Spectacular may have

attracted a different audience, or the challenge of the programming task may, in general, be taken more seriously. The audience as a whole was, however, still far below the level of what Marktoberdorf has been able to attract: my impression was that 30 to 40 per cent. could only be described as mathematical illiterates, who had never done any formal manipulations in their whole lives. After two days we had to admit that, say, one out of every three was totally unsalvageable, and from then onwards we concentrated on teaching the others. When the week was over, we all decided that it had been very hard work, but that it had been worth the trouble. The audience seemed to be uniformly grateful. The weekend was used for recovery.

Then came the two weeks of The Summer Spectacular, i.e. the International Lecture Series on Programming Methodology, largely to be presented by members of IFIP WG2.3 who, by doing so, could earn their travel expenses. On ten days and nine evenings we gave together 49 performances: the four during the daytime in the large lecture hall, the evening lectures in the still larger performing arts theatre. The 27 lecturers had prepared their talks without any mutual consultation, the result was a kaleidoscopic overview. The set of lectures was as mixed as the audience and the one seemed to suit the other. I thought that more than a third was quite good, and that is not a bad score. I gave one evening lecture and three during the daytime. In the evening lectures we had to address the largest crowds (close to 300, I guess, compared to almost 250 during the day) with the poorer facilities for lecturing: the place was more suitable for "performing arts", and, forced by the circumstances, most of us did just that. (And some of us gave remarkably good shows!)

I missed the first two days of The Summer Spectacular as I went with Ria, Femke and Rutger to Yosemite National Park. We stayed the night in the Silver Top Motel in Fish Camp, a few miles from the Southern entry. In Fish Camp we had an excellent dinner. On the day of our arrival we went to the big Sequoia's in Mariposa Grove, and I found them very impressive. My village boasts a tree that is about 380 years old, and whenever I pass it I think it a quite respectable, dear old tree. To face a tree that is undoubtedly alive and of an estimated age of 3800 years is a quite different experience! It

is just another example of how big a factor ten is..... On the next three days I listened to Hehner, Backus, Sintzoff, Burstall, Hoare, and Dahl. On Friday morning Ria returned with the children to the Netherlands, Wim Feijen had already left on Thursday.

On Saturday we did almost nothing, on Sunday we took what I can only describe as a misguided tour to Monterey and Carmel. An hour at the Municipal Wharf and one-and-a-half hour on Cannery Row is --in spite of the joined efforts of John Steinbeck and the American tourist industry-- just too much, in particular if it implies that later on the Carmel Mission and the 17 Mile Drive with the birds, seals, sea-lions and sea-otters have to be done in a hurry. For Netty van Gasteren and me it was a definite consolation to find in Carmel a good restaurant.

The next Monday I was absent again, as John Backus had invited me to give a lecture at San Jose. J.M.Cadiou --his boss and one of our students-- took me up to San Jose, early in the morning. The period immediately after breakfast is never my most communicative one and Cadiou asked me all sorts of manager's questions. I did my best and enjoyed the scenery: it was very nice not to have to drive that stretch myself. In the morning Steve Zilles showed me what he was doing: a computer-driven colour TV-screen used to display the kind of diagrams I always skip when I encounter them in a book. This time politeness forced me to look at them --though the combination of bright colours and flickering made it almost a bit painful-- . Needless to say I found my prejudices against pictures fully confirmed. After lunch I gave a talk; the facilities, I am happy to say, were adequate. After my lecture Gray explained to me a few of his "distributed processing paradigms", and that was illuminating. It seemed also very sensible: in this (still early!) stage of the game concentration on a few well-chosen (or should I say: carefully designed?) paradigms is almost the best thing one can do. Five people from IBM, San Jose, joined me for dinner in a very special Chinese restaurant that John Backus had selected: I enjoyed the food somewhat more than the company, but the food was very hard to compete with. Thereafter John saw me back th UCSC. A tiring day, but not uninteresting.

On the next four days I listened to Mealy, Turski, Reynolds, and Jackson, and gave my own four lectures (two of which had still to be prepared: material originally intended for The Summer Spectacular had been used during week zero). My lectures went this time very smoothly. (As a matter of fact, at several occasions I was impressed myself!) And for the circumstances --which I regret-- that it was sometimes hard to read what I had written or to hear what I had said, I refuse to accept the blame. Views expressed in my last lecture --the closing lecture of The Summer Spectacular, delivered under the motto "Beauty is Our Business"-- as to what should constitute the core of computing science would evoke violent opposition the next week, primarily from Jim Horning.

The meeting of WG2.3 left me with feelings more mixed than ever: some of the glue that used to keep that group of individuals together seemed to have dissolved.

One of the main components of the glue --at least: in my limited observation-- used to be the shared recognition that, evidently, we did not know how to think, speak, or argue adequately about the problems we had to think, speak, or argue about. The next stage --again in my limited observation-- was the shared recognition that (not surprisingly) only the most effective application of the mathematical method --in Morris Kline's sense: "More than anything else mathematics is a method."-- could be hoped to solve the problems adequately. The charter was clear: searching for the relevant abstractions and separation of concerns that are specific to programming, and learning how to avoid in general the explosion of formulae when dealing with stuff more complicated than mathematicians had ever formally dealt with before. I found this charter sufficiently challenging to devote my scientific life to it; at the same time this charter was sufficiently unpopular "in the real-world" --the hyphen is not my invention!-- to justify the protection of an IFIP Working Group (for what it is worth). I was forced to admit that the glue is no longer what it used to be.

1) A sizeable fraction of the membership --both old and new-- has failed to catch up with what has been achieved over the last ten years. Over and

over again people tried to "understand" the topics in ways that have already been identified as inadequate at least eight years ago. I should add that many a speaker invited this misunderstanding by thinking himself --and hence presenting his material-- in ways of well-identified inadequacy. (The mistakes of trying to "understand" a program in terms of the class of the corresponding computational histories, and of trying to "understand" programming languages in terms of a specific implementation were the most common ones. They caused endless confusion, which were depressing to witness.)

2) Some lecturers did not succeed in attaining the effectiveness required of their mathematizations. There is nothing wrong with that: WG2.3 should be the audience par excellence to offer suggestions for improvement. Sometimes, however, those suggestions were not made, sometimes they were not invited, and for a working group concerned with methodology, both seem wrong.

3) Then there are those members that I am tempted to regard more or less as victims of the Educationists with their concern for The Whole Child and their disdain for competence. They cannot content themselves with what science may have to offer to programming methodology and consider the charter as I understood it as too narrow. As a result fruitless discussions on the verge of sociology and/or philosophy were unavoidable.

In retrospect --i.e. after two weeks-- my overwhelming memory from this WG2.3 meeting is the very lousy impression I got from Xerox PARC (Palo Alto Research Center). Rumor est --and I have no reason to doubt the rumour's truth-- that our chairman Jim Horning has drawn our member W. Teitelman's attention to the fact that he had not attended the previous three meetings and had reminded him of the rule that such lack of interest could terminate his membership. Nothing wrong so far. Teitelman was, indeed, not very interested in attending the meeting, but then their common boss at Xerox PARC, a certain Bob Taylor, exerted pressure on Teitelman on the grounds that it was good for Xerox PARC's status to have a few employees on WG2.3! So far the rumour. And Teitelman attended! At least, he did so in a minimal way: he was present on Monday and wasted our Wednesday morning with a terrible video-show.

On two television screens they played a video-tape showing Teitelman himself at his terminal, playing with "Interlisp" --something I wouldn't dare to show: last year's reference manual for Interlisp is already something like a two-inch thick telephone directory!-- .(The show was --of course!-- in colour, but its technical quality was abominable: colours shifted all the time, and often the screens showed as much disturbance as interpretable picture. The quipment used, I am happy to mention, was not a Philips product. Without having attended such a session it is hard to believe what junk such a gadget-ridden subculture is willing to put up with. So much for the influence of a tool on those that try to use it!) The show itself I can only describe as insipid, and I was relieved when Teitelman showed the last remains of good sense when, with the words "This is too painful." he switched the equipment off before the show was over. This show and a discussion later during the week gave me the strong impression that at Xerox PARC research in computing science is primarily viewed as gadget development, rather than as gaining insight. (Wlad Turski gave a terse comment: "But what do you expect? Truth is not an industrial product.") In view of the fact that Xerox PARC is one of the U.S.A.'s more prestigious "research" establishments --so prestigious, as a matter of fact, that M.I.T. prides itself on mimicking it-- this is a rather discouraging observation.

On Saturday morning at 8.15 Bill McKeeman came with his car to take me to the airport of San Jose. Via Los Angeles and El Paso I flew to Austin, Texas, where I arrived at sunset. Dr. Hamilton Richards, who had been so kind to offer me the hospitality of his home, was at the airport, where we rented a small Toyota that would serve me the rest of the week. On Sunday and Monday --Labour Day-- the two of us went to the Burroughs Lab., where I met a Dutch student (from Twente) who, as part of his training, had worked there for ten weeks. Both he and the people at Burroughs seemed to be very pleased about the way in which that had worked out. On Tuesday morning and on Wednesday morning I lectured for the people that had been attracted since my last visit there. (My audience reconfirmed my earlier impression that Rice University is a pretty isolated place.) On Tuesday afternoon I had a discussion on a problem about we had had some correspondence since my previous visit; after that dis-

cussion I went home and had a little nap. (I am afraid that my body has not been built for the climate of Texas in early September: the days were exhausting and the nights not restoring.) Wednesday afternoon and Thursday morning I spent in the company of Dr.R.R.Johnson, on Thursday afternoon I visited The University of Texas at Austin where I gave my last lecture of that trip. (I did so in a large auditorium, but this time the PA system was excellent.) The next morning, at 7.15, I was on my way home. Despite all the hospitality bestowed upon me, I did not regret my departure from Austin. (On the first evening Joanne Richards, Hamilton's wife, discovered a scorpion in their little son's bed. Presumably one can get used to such encounters, but I hardly managed to do so in five days and six nights.)

I had a long layover at JFK, most of which I spent reading and writing. I had been booked on KL644, leaving JFK at 22.10 and tried whether I could get a seat on KL642 that would leave New York three hours earlier. At the expense of an additional \$ 100.-- this was possible, but I thought it crazy to reduce a six-week trip by three hours at the additional expense of \$ 100.-- and declined the offer. On board of the KL644 it became known that the KL642 had had to return to New York on account of trouble with one of the engines! Had I been lucky! We landed at Schiphol on Saturday morning 11.00, where my wife was at the airport with the car. At 13.15 we were home. During the next week I felt that I had been away for six weeks: my problems with the time shift were unusually severe.

14 September 1979
Plataanstraat 5
5671 AL NUENEN
The Netherlands

prof.dr.Edsger W.Dijkstra
Burroughs Research Fellow