

Trip report E.W.Dijkstra, USA, 10 June - 3 July 1983

Ria being unable to see me to the station, I took a taxi to Eindhoven. I took the train to Amsterdam Central Station and from there the KLM coach to the Airport. (I found this the fastest and most reliable way of going to Schiphol.) Flight KL641 to New York had very strong headwind, once changed from 33.000 to 29.000 feet and was not as smooth as usual. As a result I did not write; I read the latest issue of "Daedalus" instead, which was devoted to the topic of "Scientific Literacy". (John G. Kemeny, co-inventor of BASIC and for 11 years President of Dartmouth College, gave a striking example of superficiality: he argues that computer literacy is more easily attained than scientific literacy because programming languages are simpler than natural languages.)

At JFK, immigration was as usual, so that my suitcase had arrived when I entered the customs hall. There the introduction of a "Green Line" had been a great improvement; I delivered my suitcase to the inter-airline luggage service and walked at leisure to the PanAm building, where a relative chaos reigned. All their planes were delayed, we had to change gates, the public address system was a composition of distortion and echo. I arrived an hour late at Washington National Airport, where I was collected by my host Steve Olson. (He had phoned the Washington office of PanAm after the scheduled departure time of my flight: while the plane was still firmly on the

ground he was told that the flight was on time!)

I made this one-day stop in Washington to give Olson the opportunity to complete an interview that we had been conducting by mail since last Christmas. (The article is to appear in Science 83 - or, as the case may be, in Science 84 -, the bi-monthly of the American Association for the Advancement of Science.) The visit also served as a buffer for the time shift between Amsterdam and Los Angeles, and did so very well: I was interviewed until 23:20 and slept the next morning until 6:00. Olson told me that one of IBM's vice-presidents had been quoted, saying that computer science was irrelevant for his company's business. If true, this is bad news for IBM's customers.

Late in the afternoon I flew to Los Angeles with United Airlines, whose conveyer belt at Dulles Airport had broken down. The flight was delayed, the scheduled DC10 had been replaced by a DC8 with a spare crew, and we were combined with the passengers of an earlier flight, which had been cancelled. All my remaining flights, however, would be dead on time.

At LAX I was met by Martin Rem (who had arrived there the day before) and Alain Martin with his little Jérôme. On our way to Pasadena we generalized the relation that the sum of the first n odd numbers equals n^2 (see EWD857).

It was very nice to meet the family Martin again, whose guest I would be for the next 4 nights. On

Sunday Alain and Marianne gave a brunch in their garden for 35 people + their assorted offspring. (This was at the occasion of the 10th anniversary of their wedding.) Marianne had done all the cooking - including the pâté's - herself, and I was deeply impressed. The next two days I spent at CalTech, writing, discussing with colleagues, talking to the provost, lunching with the dean of the division, and finally giving a very technical talk, which was well received. (Though it was after Commencement, I had quite an audience.) The new provost clearly wishes to strengthen CalTech's computer science, but the division itself seems hesitant (or divided) about its direction. I doubt that avoiding the dichotomy between theory and practice has been given the priority it deserves.

On Wednesday morning I took the coach from Huntington Sheraton, Pasadena, to LAX. (Warning for future users: it arrived at LAX 35 minutes behind schedule.) The Western Airlines flight to San Diego was excellent; at Lindbergh International I was collected by Dr. L.D. Rogers of Burroughs, whose guest I would be for the next 5 nights.

On Thursday evening, after cocktails and dinner, I lectured from 20:00 till 22:00 to about 100 members of the San Diego Chapter of the ACM, on Friday afternoon I gave a (more technical) talk at Burroughs SDRC (= San Diego Research Center). I had a number of useful meetings (Dr. L. Shevel and I were introduced to each other, I met Don M.

Lyle, had a long discussion with Mrs. Janet Graessle about "the dual career ladder" and spoke with Robert F. Lakin - Director, University Relations - about publications.) My schedule at SDRC was, however, too tight. I was shown a number of projects, but I did not see enough to give any deep comments.

On Sunday, Laurie and Joy Rogers took me to "Seaworld" to see the more than 350 penguins at the new Antarctic Exhibition. This was fascinating! Also fascinating was a common murre that we have observed for almost half an hour playing under water with a pebble. We spent quite a while at a big pool in which a dozen dolphins were playing. All animals were obviously in excellent condition; I was impressed by the competence with which they were taken care of. (Minor example: near the big pool was a kiosk where one could buy little fish to feed to the dolphins, and when the dolphins had had enough, the kiosk closed. Simple, but very effective.)

On Monday I flew with American Airlines via Dallas to Austin. The flight to Dallas was so punctual that I could catch an earlier flight to Austin, which was boarding when I arrived. And even my suitcase made the connection! In Austin I called Dr. H. Richards Jr. of Burroughs ARC (= Austin Research Center) to tell him that I had arrived earlier and that he need not hurry since I had found a nice quiet cool table to work at. He came about an hour later, we rented a Toyota Celica

in which I drove under his guidance to Lakeway. For the next two days we would have a small conference - about two dozen people - on Program Verification. From outside it was attended by Donald I. Good, Robert S. Boyer and J Strother Moore of the University of Texas.

Speakers were Clark Weissman, John Scheid, Val Schorre, Debbie Cooper (SDC, Santa Monica), Deepinder Sidhu (SDC, Paoli), Don Good and J Moore (University of Texas), David Turner (University of Kent), and I. We had blackboard and overhead projector - I even used the latter - . Visuals that had been prepared for other occasions were rarely satisfactory. For me, seeing J Moore at work with a piece of chalk at the blackboard was one of the highlights; David Turner's talk was another one.

I found the conference interesting. One message came through loud and clear: formal techniques have an increasingly important rôle to play. There also seemed to be a reasonable consensus that that rôle should not be confined to verification "after the fact", so to speak, but that correctness concerns should guide the design process. Due to my presence, the feelings on the need of mechanization were more mixed. It was quite clear that the effort at mechanization has a strong influence on one's quality criteria for proofs. In some mechanization circles it seems no longer required that proofs be "elegant" in the sense as given by the Concise Oxford Dic-

tionary: "ingeniously simple and effective". But when this results in proofs of 8000 or 13000 pages (!), I feel strengthened in my judgement that elegance is not a dispensable luxury.

Texas was warm. I had left xerographic copies in my briefcase in the car, and the ink had melted. Late Wednesday afternoon we returned to Austin. The remaining 2 days of that week and the first 4 days of the next week I spent at ARC. It was an unfortunate coincidence that two of these days were occupied by a meeting between people from SDRC and ARC (on an organizational topic, to which I had little to contribute). I gave one talk for a sizeable audience, and a tentative one for an audience of two. When I did not have a discussion with others, I just worked in my office.

Friday the 1st of July I spent at the University of Texas. (Burroughs had that day a so-called "floating holiday".) Misra and Chandy showed me a beautiful theory about distributed systems (with FIFO channels), for which part of the credit was given to Leslie Lamport. But the major part of the day was devoted to planning for the Department of Computer Sciences since the University of Texas has set itself the goal of developing that department into one of the country's centres of excellence in the field. (I found it very interesting to see how they tackled that task.)

I left Austin on Saturday around noon for Atlanta with Delta Airlines, and that was as pleasant as a flight can be. In Atlanta, the KLM ground service was taken care of by personnel of Eastern who did an excellent job - so excellent that I told it to the KLM purser - . The KLM flight to Amsterdam left 10 minutes late, but the jet stream was so strong that we arrived in Amsterdam more than 30 minutes ahead of schedule. I had been seated on the upper deck and had had some sleep.

Wim Feijen and Netty van Gasteren were at Schiphol to collect me and at 13:00 I was at the hospital where Ria had been operated 3 days earlier.

* * *

At my request I was given the outline of the design of an avant-garde machine. Mark Scheevel did an excellent job, for explanation and discussion together did not take more than two hours. He explained it so clearly that I could suggest a modification, which was estimated to improve performance by 10-15 % at little or no cost. That, of course, was fun, but I am most delighted by the reason why I could make that apparently helpful suggestion at a glance: the design as presented violated one of the principles for a well-written (mathematical) article that have been discovered during the last year or so by Netty van Gasteren and me. I found that a very nice example of unexpected

transfer - typically the kind of thing no form of research planning can ever anticipate.

* * *

During my absence Ria had saved an article in the paper about French computing. It draw attention to the fact that, though neither the "Plan Calcul", nor its successors had been able to create a viable French computer industry, the French software industry was flourishing like nowhere else. This last observation was convincingly linked to the fact that the French secondary school system still takes the teaching of mathematics seriously. (Think what the French could have done if that teaching had not been infected by Bourbaki!)

* * *

During a discussion about MCC ("an effort to out-Japanese the Japanese") software engineering was characterized as what those companies cling to that have given up hope that they will ever learn how to do the programming job properly. That makes software engineering's popularity a wide-spread cry of despair.

Plataanstraat 5
5671 AL NUENEN
The Netherlands

10 July 1983
prof. dr. Edsger W. Dijkstra
Burroughs Research Fellow