<u>Trip report E.W.Dijkstra, USA, 1-27 Nov. 1981.</u>

My itinerary was as follows:
on the 1st Nov. from Nuenen via New York to Edison, N.J. to give a lecture at Bell Labs (on the request of Burroughs); on the 3rd Nov. to Ithaca, to visit Cornell University (on my own initiative); on the 8th Nov. via New York and Boston to the "Wang Institute of Graduate Studies" (invited as Distinguished Lecturer by Bill McKeeman); on the 10th Nov. to Austin, Texas, for a visit to the Austin Research Center of Burroughs Corporation; on the 20th Nov. to Pasadena for a visit to CalTech (at their request); on the 26th Nov. back home, where I arrived at 18:00 the next day.

With most flights there was something wrong. In Amsterdam we left with a three-hour delay after a change of planes because of a failing lock of a luggage compartment door and half an hour before landing at JFK the captain announced that there was nothing to worry about: we landed with the fire engines along the runway. My flight from La Guardia to Ithaca was changed to one from Newark, but at checking in I learned that that one was going to Syracuse! The change was undone and I still caught my original flight from La Guardia. The flight from Ithaca was cancelled; eventually I flew from Syracuse to La Guardia, where I missed my con-

nection to Boston. The flight from Boston to Austin had been moved forward over 9 minutes, the one from Austin to Los Angeles over 50 minutes. The return flight was OK; reaching LAX from Pasadena, however, had been difficult: it was the afternoon before Thanksgiving and all the freeways were jammed. I was very tired when I came home, and slept most of the following sixteen hours.

At Bell Labs I spoke one morning for an audience of 200 (with only 3 miserable flip charts as visual aid). At Cornell I gave a seminar (for 75 people) and one of the lectures in Fred Schneider's course. At the Wang Institute I gave a lecture for 278 people —no blackboard of course!—. At the University of Texas at Austin I addressed 150 people (without throat microphone, but the acoustics of the lecture hall were adequate). At CalTech I gave a seminar (for a larger audience than the lecture room could hold) and two lectures in Alain Martin's course. All these public performances went very well; I have lectured on five different topics.

From my visit to Edison I don't remember too much. I was collected at JFK by Tom Schaible, who lost the way: after almost an hour we were back at JFK. Monday morning was used for recovery; in the afternoon we inspected the lecture hall and I redesigned the introduction of my lecture in view of the absence of decent facilities.

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In the evening we were offered a dinner by Bell; Walter McWilliams and Steve Bourne were among our hosts and it was a pleasure to meet them again. I missed Doug McIllroy. Shortly after lunch on Tuesday, Schaible and I left for the airport.

I spent Wednesday, Thursday, and Friday in the usual way at Cornell. People came in to show me what they were working on. (John Hopcroft being absent, I could use his office.) The first hours they had not discovered yet that I was there, so that I could get some writing done. I saw several "program development environments"; one, geared to PL/C, was particularly silly; another one, generating verification conditions, was silly too, but more interesting. It used attribute grammars and, three days (!) after they had realized that they could do first-order predicate calculus in the same manner, they had that system working — well, after a fashion: it failed to prove something like $(a \land b) \lor \lnot a \lor \lnot b$. (Not quite certain what had happened, the author blamed Gentzen.) Talked long with Fred Schneider and with Jan Prins; agreed with the latter that a project by one of their physicists — something like program improvement by semantics preserving but otherwise random mutations — was crazy. About the way in which they intend or try to apply logic — Constable's influence? — I am not too happy, but I guess a few youngsters will recover. It is still a very good department but is definitely begin-

ning to suffer from the ubiquitous terminal. I stayed with David Gries and spent most of Saturday writing. Neither David nor I had the home telephone number of Bill McKeeman who had promised to collect me on Sunday at the Boston Airport. When my flight was cancelled, David managed to get the message through by calling John Guttag, who is now at MIT.

I stayed two nights with Bill McKeeman at his home in the woods. Sunday evening we had dinner there with seven, among whom Nancy Martin, whom I had met in January 1974 in Albuquerque. She is now on McKeeman's faculty. On Monday morning I prepared my transparencies. Then I had lunch with James Bouhana, who was worried about syntax and is co-authoring a book with Peter Denning. Dinner after my talk, and the next morning a two-hours discussion with more than a dozen students of the Wang Institute. Finally, three of them —they were very nice ones— saw me to the Airport.

The Wang Institute sells its Graduate Studies aggressively — I stole a folder: "The most successful, most powerful software engineering leaders of the next 20 years will remember this building well." — in an environment full of computing industries of all sizes —among the audience at my lecture I counted more than 30 of such affiliations — . But if its graduates remember "this building" 20 years from now, they

may do so to curse it: the Institute may bestow the degree of "Master of Software Engineering" and suffers accordingly from all confusing connotations of that misnomer. The curriculum was entirely geared to today's practice and lacked substance. Most students were employed by one of the 30 industries — who, as a rule, payed the tuition fee of $7000,— ! — and Bill McKeeman swore that such was the curriculum those employers preferred. I left the place in a state of some distress. (I fear that the place is aptly characterized by the fact that my predecessor as "Distinguished Lecturer" had been Tom Gilb!)

The first two days at Burroughs's ARC (= Austin Research Center) coincided with a visit by a couple of vice-presidents from Detroit. On Friday I went for half a day to the University to talk with Misra and Chandy. With the exception of Wednesday afternoon — when I met Boyer and Moore at the University and gave my lecture — I was at ARC the next week. One morning I helped a little group of people to read an article: its approach was unfamiliar to them but I felt that they should know it. One afternoon I lectured on program development. One day was devoted to a discussion of proof patterns, another one to the dispelling of false hopes. And I tried to help clarify the direction of ARC's future research. At the end of that week I was exhausted. Each morning I was woken up at 7:00; at 7:45 I left

and around 8:10 I arrived at the lab, where I stayed until 17:00 or 17:30. And on at least six evenings I had dinner in town (which often meant that shop talk went on).

When I arrived in Austin, Hertz did not have the ordered (and promised) Toyota; I was given a Ford Mustang — with automatic gear shift, etc — instead. When I told my hosts that in the Netherlands the Ford Mustang was only used by beginning pimps, it was immediately known as "the pimpmobile". I did not like it at all and was glad to return it when I left for Pasadena.

In Pasadena I stayed with Alain and Marianne Martin. That weekend we did nothing until Sunday evening, when four people from the department came for a drink. The next two-and-a-half days I spent at CalTech in very much the same way as at Cornell. I spent several hours with Chuck L. Seitz and with Carver Mead; they both struck me as designers with great confidence. The whole atmosphere was rather pragmatic (perhaps a bit too pragmatic for my taste). I met two bright graduate students, but was not impressed by the quality of their average graduate student. On Monday evening I had dinner with a number of undergraduate students in one of the dormitories. Suddenly there was a deafening noise; in his room, one of the undergraduates had been fooling with his guns. One student explained

to me that he did not care about the quality of his (hand)writing because he was preparing himself for an industrial career.

I could not resist the temptation to use for my last lecture a quotation from one of their own professors (of half a century ago), viz. E.T. Bell "Pictures after all may be suitable only for very young children." Shortly before I had been shown the department's system for colour graphics; when I looked at a screen displaying a text in four or five different colours, the system was recommended because it was so handy for making transparencies.

I could have guessed this. Alain had already warned me that at the beginning of each of my lectures we would have to remove the overhead projector. The cocktail party after my lecture at the University of Texas at Austin had prepared me. When the topic of my lecture — "The presentation of programs" — was mentioned, one of the faculty members, who had not attended my lecture, fully understood my choice of topic because there had been so much progress lately: "Books on programming used to be very dull, but recently I have seen at least two books with nice colour graphics." (I behaved very well and did not answer by telling that I had used white chalk only.)

The whole trip was a reminder not to confuse the problems of computing science with the problems of the American educational system, which treats the young American if not as education-proof at least as education-resistant. In this pessimistic mood, the pupil does not expect to get educated, the teacher does not expect to have much effect, and the whole educational process works only after a fashion. The same pessimism underlies the tacit assumption that you cannot expect a human to do an excellent job and the consequent craving for "tools". (It got so bad that, when in the discussion after my last seminar someone mentioned "powerful language features", I had to point out quite explicitly that a programming language never solves your problems and that you may be grateful when it does not add to them.)

During the weekend in Austin I read "Less than words can say" by Richard Mitchell (also known as "the underground grammarian"); very amusing and equally distressing. "Should we raise a generation of literate Americans, very little of the America as we know it would survive." I am afraid he is dead right.

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