Trip report E.W.Dijkstra, U.K. - Bahamas - U.S.A., 11 - 30 April 1978.

The three main purposes of this trip were
1) Participation at a meeting of the IFIP Working Group WG2.3 on "Programming Methodology", held on the premises of Warwick University, U.K.
2) Participation at a Burroughs Technical Seminar, held at the Bahamas
3) A visit to the Burroughs Plant at Westlake Village, California

The three secondary purposes were
1) to meet prof.R.H.Cannon, Chairman of the Department of Engineering and Applied Science of the California Institute of Technology
2) to address the A.C.M. Chapter of Santa Barbara, California
3) to give a talk for the A.C.M. Student Chapter of Union College in Schenectady, New York.

Fringe benefits were a short visit to prof.C.A.R.Hoare in Oxford and a weekend with Dr.M.Rem in Pasadena.

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During the month of March I had spent all my available time on the study of the four programming language proposals submitted to the U.S. Department of Defense: the Blue Language (SofTech), the Green Language (Honeywell/C.I.I.), the Red Language (Intermetrics), and the Yellow Language (S.R.U.). After I had mailed my reports I had still a week for dealing with my postponed obligations before I left for this trip. But during the whole trip the DoD enterprise has been with me very much.

In Warwick quite a few people involved in one of the designs or employed by one of the tenders, were present, and which two of the four --if any-- would get a "phase 2 contract" was (understandably) very much on people's minds. Although not a party, I was very interested too, as I had suggested to Lt.Col. William A.Whitaker to proceed with none of the four, because they were all too poor. For several days it looked as if the DoD, indeed, could not make up its mind and would reconsider the whole matter. Eventually it transpired that the Green Language and the Red Language got a "phase 2 contract" and will be pursued. But don't ask how that decision has been enforced!

An advisory committee had been formed to assist the DoD in absorbing the evaluations of the 75 teams that had been asked to evaluate the designs; this committee comprised among others D.Fisher (DoD), prof.W.Wulf (Carnegie-Mellon University), prof.D.Gries (Cornell University), and prof.J.Reynolds (Syracuse University). That committee has met for two weeks in Pittsburgh, where it produced a 12-page report with summary and recommendations; I have been told --by the well-known "reliable source"-- that Lt.Col. William A. Whitaker, however, has refused to distribute this report among the members of the decisive meeting "because it was too negative". One just suppresses the unfavourable evidence! So, when a few years from now the new, stupid DoD programming language emerges in its full horror, please don't blame today's computing scientists for that disaster. It is neither unusual, nor misplaced, for scientists to wonder sometimes why the rest of the world tolerates them at all --remember that the oxford Colleges have originally been founded as fortifications for the protection of the students against the anger of the citizens!-- ; but shouldn't scientists sometimes wonder why they should tolerate the rest of the world?

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After my lectures early in the morning I left my country on Tuesday the 11th of April in a raging snowstorm. (Two days earlier, my wife had been sunbathing in the garden!) The flight to Birmingham was smooth; upon arrival we were collected by our host, prof.J.N.Buxton, and one of his staff members took us to the University. The campus, like each modern campus, is full of signposts telling you were to go; at a certain moment we were faced with two arrows, the one said "Special Deliveries", the other one said "Benefactors", and we followed the latter. It turned out to be the name of a hall of residence, where I was given a beautiful room that was divided over two floors. Downstairs desks and easy chairs, upstairs beds and a bathroom. I have used that room intensively. On our "afternoon off" I did not tour the countryside --although I knew it to be very beautiful-- but had a long discussion with prof.R.M.Burstall from Edinburgh.

The reason was that earlier this year I had had to referee a couple of papers with a strong flavour of Artificial Intelligence. In both cases I had recommended rejection because, according to my scientific standards, they did not have enough "meat" in them. After I had done so a number of times in succession, I got a little worried, and I wanted to know whether the superficiality observed was only characteristic for the authors in question, or was typical for the whole field. As I was fearing the latter I wanted to give Artifical Intelligence a last chance before definitely rejecting it, and I had asked Rod Burstall to try to convince me of the scientific decency of the field, considering that if Rod couldn't convince me, no one would be able to do so. Rod --not a letter-writing type-- had postponed answering my letter until we met in Warwick. He has had his chance but did hardly succeed; his plea was, as a matter of fact, somewhat half-hearted, well aware himself that the field had mostly attracted charlatans. An instructive afternoon. Another evening I had a long discussion with Mike Woodger and Brian Randell, mostly discussing academic affairs.

During the first two days we had a number of very disappointing sessions, because in particular some American speakers --and not only observers, but full members as well-- had forgotten the rules of the game: instead of submitting a topic for discussion, they gave salestalks. An organizational improvement would be to rule that during the first, say, two days, only members will present topics (and the more talkative they are, the lower their priority!) Later in the week talks by Hehner (Toronto) and McKeeman (Santa Cruz) restored our faith in the computing science from overseas. Arsac and Fokkinga gave clear expositions, Fraser Duncan gave a very short one, of which I did not understand why he paid so much attention to such a small point; before I could ask him for elucidation, he had left again. Hoare gave an exciting survey of what he was trying to achieve, I spoke twice, on the first day on the role of "types" --a direct result of my involvement with the DoD language proposals-- , and on the last day about the modularization of proofs. In the middle of the meeting we had a discussion about "shellsort", because Fraser Duncan had used this algorithm as an example.

This discussion about "shellsort" was necessary because most of the members --I included-- did not know the algorithm and would like to understand it. It was a bit discouraging to observe that even among the members of WG2.3 the light only propagates very slowly: some members wanted to explain it by means of the trace of an example (!), and when the loops had at last been provided with the proper invariant relations, some members turned out to be so unfamiliar with modern proof techniques that they failed to

be convinced and still did not "understand" the algorithm, thereby showing that their patterns of understanding were still rather inadequate. One of our professorial (!) members did not know that the empty conjunction is properly defined as true (in the same way as the empty product is properly defined as 1). The wide-spread unfamiliarity with the first-order predicate calculus remains for me a matter of serious concern.

The WG2.3 meeting extended from Wednesday morning until Sunday afternoon. Some time after four o'clock, Hoare, who had his car with him, took J.Stoy and me to Oxford, where we arrived at half past five. Stoy was dropped near his home, and Hoare took me with him to his home. I kissed his wife, admired his new house --I had not been there yet-- and before dinner we had a short walk in the old centre of the town. Oxford is very impressive, in my memory Cambridge was still more overwhelming. The next morning I paid a short visit to his Programming Research Group at 45 Banbury Road, from where I went by taxi to Heathrow Airport.

Thanks to my stay in the U.K. I had already absorbed one hour of the time shift; on my way to the Bahamas we got another six hours difference to cope with. I had arranged to make that flight in the company of prof.N.Wirth --who had come that morning from Zurich-- ; in the departure hall I was joined by R.Needham from Cambridge, who was heading for the same destination, the Burroughs Technical Seminar on the Bahamas. The three of us --the European speakers at that Seminar-- had three seats in a row. The intermediate stop at Bermuda was unpleasant: the airport personnel was impolite and authoritative. The overwhelming impression was one of inhospitality. Is Bermuda somewhat dictatorial?

The arrival at Nassau Airport was more pleasant. In a car that had seen better days --a limousine run by "Majestic Tours" if I remember correctly-- took us to the Britannia Beach Hotel on Paradise Island. It took us through Nassau, i.e. a town composed of Roman Catholic Missions and squalor; the town is connected to Paradise Island via a high bridge, at the end of which you have to pay $ 2,-- , a toll the main function of which is presumably to keep the Nassau poor out of Paradise.

If you ever get the opportunity of missing Paradise Island, please take it with both hands! It is a miserable place, presumably run by the maffia. The hotels are built around a casino that attracts many visitors --understandably, for if you don't attend a technical seminar on the Bahamas, there is very little else you can do (except "nothing")-- . The climate we were exposed to was terrible: hot and humid. In spite of the fact that I was very tired when I went to bed --we made long days-- I never slept more than a few hours, after which I woke up soaking. (I really did not know what to do: my fountain pen had broken in Warwick, and on Paradise Island it was so humid, that writing with my ballpoint was hardly possible.) The next week, when I described Paradise Island as a close approximation to Hell, someone remarked "What do you expect? The Virgin Islands have been raped fifteen years ago....". To crown the misery provided by nature, there was heavy air pollution in the form of ubiquitous Muzak; it really made me sick.

Shortly after we had arrived in the hotel we were spotted by our host. John G.Cleary, who took us with dr.R.R.Johnson, dr.D.M.Dahm and several other people out for dinner in "Martinique", opposite to the hotel. Martinique's kitchen was excellent, but again Muzak prevented the enjoyment of the food. In its way it is really "class": jacquets are obligatory! Of course I did not have a jacquet, but that problem was very easily solved.

I was given a jacquet upon entrance, I did not need to put it on, it sufficed when I carried it in my hand through the restaurant to our table, where I could put it on the back of my chair. I could only conclude that some of the missions I had seen were run by the Jesuits.

The seminar was three-and-a-half days: on Tuesday we had 3 speakers, on Wednesday and on Thursday 2, and on Friday morning 1 ; each speaker spoke two-and-a-half to three hours. Of the five American speakers two were captains of industry (Erwin Tomash of Data Products Corporation and dr. Robert Noyce of Intel Corporation), the other three were from the academic world (Prof.Michael Hammer, M.I.T., Prof. Anatole Holt, Boston University, and Prof.Thomas Huang, Purdue University). One could not fail to observe that the industrial speakers were much better than the three academic ones: the two captains of industry were impressive and very interesting --for me at least-- , the three professors failed to meet academic standards (the latter annoyed me very much and I am afraid I showed it). Wirth gave a very interesting survey of his activities as a language designer, and gave a valuable insight in the multitude of considerations to be taken into account. Personally I was glad that in the case of MODULA he went into greater detail; thus he provided in passing a good introduction to Needham, who spoke on the last morning about the "capabitily-based" system he had designed at Cambridge. I found him very instructive, but less convincing; at last I know what "capabilities" are. I have a hard time to believe that this is the way to go, they are too much the engineer's bottom-up conception to inspire full confidence. But he was at least very clear about a topic around which much confusion has been created. I spoke on the technical aspects of reasoning effectively about systems displaying concurrency, but suffered from a mismatch between the size of the audience and the size of the blackboard (which was miniscule and rather unstable); I did not get the feedback I had asked for, did not know whether to slow down or to speed up and am afraid that on the whole I did not reach my audience to the extent I had hoped. (With the software people I felt that I had to cross the barrier caused by no agility in the predicate calculus, with the hardware designers in my audience I had the problem that most of them never prove anything at all.)

Noyce of Intel impressed me by his technical competence and by his cynicism. They are satisfied with a yield of 30 percent, i.e. with two out of every three chips rejected because they fail some test. While it is clear that the two are rejected for good reasons, it is totally unclear that the third one is kept for equally good reasons. When doubts regarding his quality assurance were expressed, he said "Well, I agree that it is highly unsatisfactory, but it is not serious, for our competition can do no better." Here spoke the true businessman. It was a very instructive, but far from reassuring session.

Early Friday afternoon we left the Bahamas; I had even succeeded in extricating my laundry before I had to check out. My plane to Miami left too late, but I was pleasantly surprised to see it --being a plane of Bahamasair-- reach Miami at all. I had changed my flight from Miami to Los Angeles so as to give me some more time to change flights in Miami and I caught my connection. Visitors to the Bahamas I recommend not to rely on the telephone connections with the U.S.A.

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At half past seven p.m. local time, I arrived at Los Angeles, where

Martin Rem was waiting for me at the gate. With him and his wife Ellen I spent a nice restoring weekend. On Saturday morning I bought a new fountain pen, on Sunday I was shown the Huntington Gardens and the Huntington Library. For the first time in my life I saw Gutenberg Bibles, and I was very much impressed by the quality of the printing: if you compare that with the quality of the average computer print-out, sobering thoughts about progress assail you.

On Saturday afternoon Martin and I had a discussion of more than two hours with Professor R.H.Cannon of CalTech about the future course of computer science at that institute. I found him an impressive man, and I hope that my advice and comments will be helpful. On our way home Martin told me that Cannon is CalTech's only Department Chairman that combines his chairmanship with the normal professorial duties: he arrives at six o'clock in the morning and works at his institute until ten o'clock in the morning, when he goes to his other office where he is "chairman" for the rest of the day.

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On Monday morning Martin took me to the Burroughs Plant in Westlake Village, where I worked the next three days. On Monday and Wednesday we discussed the topic that was the purpose of my visit, on the Tuesday in between I had an informal discussion with about 16 designers and programmers about whatever topic seemed relevant. The group had prepared a list of eight suggested topics, six of which we covered --the remaining two I did not know much about-- . This discussion was not held at the plant but in a nearby Holiday Inn, where the facilities again consisted of a ridiculously small and unstable blackboard. But this time the audience was much smaller and I did get the feedback I needed --were they more frank because their bosses were absent?-- . It was a very satisfactory day for both parties, but we had to stop shortly after three o'clock, because that evening I should address the Santa Barbara Chapter of the A.C.M. . Janice Chelini, who works in Westlake Village but still lives in Santa Barbara offered to take me up North and to have me as her guest for the night. After our arrival in Santa Barbara I had an hour to prepare some "visuals" --I had been warned that an overhead projector would be my only tool-- and then we went, for the cocktail party, the dinner, and the lecture. I spoke from 8.15 until 9.50 p.m. and think that I got my message across. It was the first time in my life that I gave a lecture with visuals that I had prepared in advance; I did not like doing it. Afterwards we were joined by a few young people from the Santa Barbara Plant; I went to bed at midnight, it had been a long day, during which I had done a lot of talking. The next morning I was woken up at 6.30; after a light breakfast we left and we were back at the Westlake Plant at 8.20. I thought that I would be there the whole day, but the session was stopped somewhat abruptly early in the afternoon. Because I had to leave from LAX the next morning rather early, a room in the Hyatt House near the Airport had been reserved for me. The man who had offered to take me to that hotel preferred to be out of Los Angeles again before the rush hour started. I passed that evening in my hotel writing.

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Thanks to the different time zones it was already evening when I arrived in Schenectady. The next day I had a busy schedule: a curriculum discussion with faculty members of Union College and of Renselaer Polytechnic Institute, a lunch, an informal question-and-answer session with students, my official talk, a reception and a dinner.

The discussion about the curriculum was very instructive for me, as I learned what happens to an institute that is forced to concentrate upon vocational training. I suggested that instead of training the people industry asks for, they should train the people industry needs. This was a new idea for them, but they quickly explained to me that it would be very difficult to follow that suggestion, due to the narrow-mindedness of their students. The frequency and emphasis with which I was asked how I did "motivate" my students was illuminating, although depressing. Walking over the campus one did indeed get the impression that stereo sets were the students' main interest.

At the end of the afternoon I addressed a full auditorium --equipped with adequate blackboards!-- , but I felt a little bit like Klaus Müller whose thesis on Garbage Collection was requested by a sanitation department. Besides the whole departments of computer science I had attracted Union College's Department of Philosophy by my title "The Dining Philosophers Revisited". All through my lecture I have been very careful to refer to my philosophers as "it". The lecture went very smoothly, and the discussion was animated. During dinner I heard that a Union College undergraduate had remarked that he regarded me as an unacceptable teacher of computing science because I put too much mathematics into the subject....

The next day, before they saw me off at the Airport, my hosts assisted me on a shopping errand. A friend of one of my sons had asked me to try to buy some pocket books by a certain Carlos Castaneda. I was lucky, as these books turned out to be best-sellers, and best-sellers seemed to be the bookshop's specialty. The books in question seemed to me to be complete junk, magic, sorcery, and cheap mysticism, but being asked to do so, I bought them all the same. It was a definite consolation for me that I retrieved them from the shelves devoted to ... Social Sciences!

After we had done our shopping we had a glass of beer. I had hoped to drink that on a terrace, but it had to be done indoors, were the ubiquitous Muzak couldn't be escaped. By now fully exasperated by that insipid noise I asked the waitress whether she could turn down its volume, but she could not! "We don't control this ourselves." It is just Big Brother! I left with the uncomfortable feeling that 1984 is getting close.

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On Sunday morning I landed at 8.20 at Schiphol Airport, where my wife was with the car. At 10.15 we were home, where we were greeted by the dogs, whom we took for a walk. Since then I have combed them.

During my absence Spring had arrived.

3rd of May 1978

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