

Reflections

– mostly over my professional life

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Abstract

A critical review is presented of my studies and jobs since I was 18. An essence is, that I, (i) lacking “that sort of ambition”, never really sought a career, and (ii), not being very smart, often landed in jobs, typically at IBM Research 1969–1973, where I really did not know how to do things, and (iii) never really having distinguished between ‘research’ and ‘science’, did not do any serious science till after I retired!

Contents

1	Introduction	1
2	Reflections	2
2.1	M.Sc.EE. studies at DTU, Sept., 1956 – Jan., 1962	2
2.2	IBM Nordic Labs., Stockholm, Sweden, Mar., 1962 – Dec., 1963	2
2.3	IBM SDD Labs., San Jose, California, USA, Dec., 1963 – Aug., 1965	3
2.4	PhD studies at DTU, Oct., 1965 – Jan., 1969	4
2.5	IBM ESRI, Geneva, Switzerland, On/off: 1967–1968	4
2.6	IBM ACS, Menlo Park, California, USA, Feb.–June 1969	5
2.7	IBM Research, San Jose, July 1969 – March 1973	5
2.8	IBM Vienna Lab., Vienna, Austria, May 1973 – August 1975	7
2.9	DIKU, Copenhagen, Denmark, 1975–1976	8
2.10	DTU, Denmark, Sept., 1976 – March, 2007 – 1st Period: – June 1992	9
2.11	Dansk Datamatik Center, Fall 1979 – Summer 1989	9
2.12	The Govt. Informatics Commission: Nov. 1982 – Spring 1984	9
2.13	UNU/IIST, Macau, July 1992 – June 1997	9
2.14	DTU, Kgs.Lyngby, Denmark, 1976–2007 – 2nd Period	10
2.15	NUS, National University of Singapore, 2004–2005	11
2.16	JAIST, Japan Adv. Inst. of Sci. & Tech., Kanazawa, 2006	11
2.17	Hagenberg: February–April 2007	11
2.18	Retirement: 2007–...	11
3	In Closing	12

1 Introduction

I have lived now for 88 years – and enjoyed it all! Three strands have dominated my life or are dominating my thinking: (i) my Christian Lutheran Evangelical faith, (ii) my family: Kari, our children and grandchildren, and (iii) my professional work. I have no hobbies. But I listen to music, enjoy our house & garden, read books and travel. This note reflects on some aspects of my professional life. In a sense I have had no “career” ambitions. At mature age, in my late thirties, I slowly became more-and-more curious: that was what, without my realizing it, drove me: trying to understand I think of my professional life as having been

a school boy, a student, an engineer, a researcher, to, finally, in my retirement becoming a scientist!

This document shall find its place, as a separate chapter, in “my memoirs”: *Walker, there is no Road.*

2 Reflections

2.1 M.Sc.EE. studies at DTU, Sept., 1956 – Jan., 1962

The $5\frac{1}{2}$ years towards my M.Sc.E.E. were quiet. We were taught, as in school, to become engineers, neither researchers nor scientists. We were taught, the first 2 years, traditional topics of science: mathematics – but not mathematical logic – physics – also nuclear, mechanics, electricity, chemistry – and wasted enormous time on engineering drawing. Then a year of “practice”, though in the fall, there were also courses in metallurgy, static constructions, blowing glass and machining. In the spring we then went into “real” practice: I was working 3 months at a radio manufacturing company: Sonofon, and 2 months at the test laboratory of the Jutland Telephone Company: all a complete waste of time. After that $2\frac{1}{2}$ years of the “real stuff”: electrical and electronics engineering: magnetic field theory – with perhaps the only scientist professor (Hans Lottrup Knudsen), network theory, radio & telephone theory, etc. A $\frac{1}{2}$ year M.Sc. thesis project together with a course on computer engineering ended my studies: the thesis topic was analyzing avalanche transistors – which I soon lost interest in and read Morten Nielsen poems from a book opened up on my laboratory desk. I graduated with a well above average grade in Jan. 1962.

An Evaluation

I may have learned to become an engineer. But the greater beauties of my field, its underlying science, the philosophies behind, etc., eluded me.

2.2 IBM Nordic Labs., Stockholm, Sweden, Mar., 1962 – Dec., 1963

I did not pass the compulsory tests for entering the Danish Armed Forces. The tests were in mid January 1962. I had planned, if OK’ed, to choose the Royal Navy! Instead, when leaving the test center, in Nyropsgade, in Copenhagen City Centre, I came by the Danish IBM HQ, and, remembering IBM’s employment ads in the DTU Students quarterly *Polyteknikeren*, I went in, got to the top floor, as advised, and expressed my interest in a job at their recently established *IBM Nordic Laboratories* in Stockholm, Sweden. It was a Thursday. Monday morning next I flew to Stockholm, took the bus and a taxi to the Laboratory office in Solna. Met the director, *Cai Kinberg*, and a few of his colleagues. Talked with them for maybe 20 minutes, was then “taxied off” to the *Vällingby* branch, where I was interviewed by ... – who also wished to subject me to a so-called ‘aptitude’ test, which I kindly refused! OK. Then back to Solna and a fine, late lunch at restaurant *Stallmäster-gården* with Carl-Johan Åström and Ivan Carter. Back in Solna I was presented with a white shirt, tickets for a *Max Frisch* theatre performance, *Andorra*, at the Royal Theatre’s experimental stage – and a reservation at a hotel! Yes, they wanted to hire me and would present a contract offer the next morning – for me then to fly back, tickets arranged and all that! The next day, upon my farewell, in

Cai's office, I wrote in the guest book: "*Come what come may, / Time and the hour runs through the roughest day*" – from Shakespeare's MacBeth!

I began on March 1st, a Thursday.

I was first assigned to the control automation group of Carl-Johan Åström and Ivan Carter – doing linear programming for the Swedish steel manufacturer *Sandviken's* electro-oven for making chrome/Nickel 18%/9% steel. Went to Gävle/Sandviken a few times. But that wasn't me. Consequently, when the lab. embarked on the digital design of a data communication "box", the IBM 1070, I was transferred to that group, led then by Ingemar Ringström and already staffed with Torsten Åkeson. Later a few others joined. Torsten, an engineer, came from the L.M.Ericsson Labs., from where also Ingemar Ringström came. That was late summer/early fall 1962.

We did the design in the period early fall 1962 through fall of 1963.

My days in Stockholm were good. I had a room with bath in Mrs. Ingemarson's apartment on Kommendörsgatan 3 – right smack in the center of Östermalm. A very desirable location. Could walk, and did walk, to wherever, in Stockholm centre. Had lunch, on work weekdays, in a canteen across the street from the Lab., and in restaurants week-ends. Week-days I made my own breakfast (and, most weekdays, also a simple dinner) at home. I had two IBM Lab. friends: John Freer (English/Australian) and Svend Larsen (Danish). I bought books, at Nordiska Bokhandeln; read them.

Work was satisfying. I liked it. Slowly I became good at it.

I brought my red Vespa scooter up in May 1962. I could now use it to get to work. In January 1963 I bought a light blue MGB, #100 off the production line, to be delivered first week of April. Now Uppsala / Uppland, the lands around Mälarn, etc., lay open. Svend and I would motor around week-ends!

In September 1963 Ingemar Ringström called me into his office. Did I still have my wisdom teeth? Well, You, see, we would like to complete the IBM 1070 design at IBM SDD in San Jose, California, with You as part of the team "over there"! How about it? Would You accept a transfer? Wow! Yes, of course. OK, then, here is the dentist we can recommend in Vällingby. So we were some who had our so-called wisdom teeth extracted!

2.3 IBM SDD Labs., San Jose, California, USA, Dec., 1963 – Aug., 1965

I made a short visit to my parents in Aarhus – where I met Prof. Werner Wolfgang Rogosinski¹, on sabbatical from University of Durham, England. Originally from Wroclaw, Poland, but, as a Jew, had to flee in the mid thirties. Then I flew, PanAm, via Reykjavik to San Francisco. Stayed the first 4-5 days at the Hyatt House Motor Inn, at the intersection of the number 101 and 17 freeways in San Jose. Met my colleagues, including Ingemar Ringström there. Went straight to work the next day – and with Torsten Åkeson also went house-hunting. That was easy, same day we signed contract for no. 3 apt. at 101 Oak Rim way, just off Blossom Hill Road, in Los Gatos, 10 miles down Blossom Hill Road to the IBM Labs.

I soon got settled. Daily ride, 8+ hours of work in Bldg. #14.

Weekend trips to San Francisco. Meeting Prof. Rogosinski's cousin and his wife, the diamond trader Ernest Baerwald and Florence, he also from Wroclaw, Florence from NYC. The Baerwalds had a fine house on Filbert Street, Presidio Heights. On two occasions Florence asked me to pick up Gábor Szegő at Stanford: he was known to them through Prof. Rogosinski!

¹https://en.wikipedia.org/wiki/Werner_Wolfgang_Rogosinski

And also Harvey C. and Grace Pope. He had contacted my grandfather in 1929 as representative of International Lumber Company Philadelphia, Pennsylvania, USA / and their Philippines plantation – offering Mahogany lumber. That became an almost 50 year liaison. Two of my cousins each spent two years there in the 1950s/1960s. He had retired around 1960, and they had taken a lovely house in Atherton, 1/2 between Los Gatos and San Francisco.

2.4 PhD studies at DTU, Oct., 1965 – Jan., 1969

I studied at DTU from October 1st, 1965, to January 31, 1969. My official PhD-tutor was Prof. Per Geert Jensen, a kind man. He knew nothing about [theoretical] computer science, but Peter Johansen, later Niels Andersen, bot assistant professors, knew some. Peter Johansen guided us, we were 5 PhD students, through Michael Harrison's Automata and Formal Languages textbook. An associate professor of the Mathematics department took us through W.W.Peterson's book: Error Correcting Codes.

At first I thought I would study 'cellular logic' à la Robert Minnick² etc., but after having "discovered" a cellular multiplier [5].

I gave that up – and "switched" (!) to "automata and formal languages". Peter Johansen, later full professor at Copenhagen Univ., was grappling with a problem which he explained to me – and the next day I presented him with my solution! It became the departure point for my PhD thesis [4]. Peter got rather unhappy about this. Our professor, Per Geert Jensen, mediated the "dispute". Peter and his wife Jytte became our life-long friends.

Otherwise there really was no one around who instilled some scientific curiosity.

An Evaluation

My PhD study in the 1960s at The Technical University of Denmark was OK in the sense that I could write 'PhD' on my CV – but it did not really train me for the kind of research I was expected to do, later, at IBM Research – see below.

2.5 IBM ESRI, Geneva, Switzerland, On/off: 1967–1968

Gunnar Wedell, my "boss" at the IBM Nordic Labs., called me early 1967. Was I interested in giving two 4 week courses a year at the IBM Systems Research Institute, ESRI, in Geneva, Switzerland?

So in 1967 and 1968 Kari and I motored, in our little, blue MGB through Germany to Geneva. We stayed two times at the 5 star Hotel Metropole and once at a nearby, also nice hotel, in a nice room with a kitchenette. The fourth time I was alone: Kari was pregnant!

The Geneva ESRI office was right smack in the center of Geneva, just off Rue du Rhône. Later it moved to Rue Pierre-Fatio.

I met some interesting people there: Gerald Weinberg, Peter Sheridan, Lassi Hyvärinen and, the boss: Carlo Santacrose. The latter provided me with a credit card, paid all my expenses for attending the August 1968 IFIP World Computer Congress in Edinburgh – where I first met Ivan Havel.

I lectured 3 times a week, 2 hours each time, to around 30 IBM systems engineers. The topic was computer logic hardware design.

²<https://apps.dtic.mil/sti/html/tr/AD0433802/>, <https://dl.acm.org/doi/abs/10.1145/321386.321387>

While in Geneva Kari and I were able in weeks-ends to tour Switzerland and Northern Italy. In May 1967, on the occasion of the wedding of then Crown Princess Margrethe to Henri Marie Jean André de Laborde de Monpezat we went via Bern to Zürich where the TV stations covered the wedding. On another occasion we went to Stresa and Milan. And on yet another such we went to Lyon. On the way down to Geneva, in March 1967 we had lunch at Auberge de l'Ill in Illhaeusern, Alsace. When we booked, by Fax in those days, in early February, it had 2 Michelin stars; when we arrived it had three!

2.6 IBM ACS, Menlo Park, California, USA, Feb.-June 1969

In November 1968, three months before my PhD graduation I asked my IBM Nordic Labs. boss, Gunnar Wedell, whether he could “land me” an assignment to Gene Amdahl’s ACS, Adv. Computer System, project at Menlo Park, CA. And he did!

So on the 31st of January 1969 we flew, three persons, 1st class, to SFO. Installed ourselves at a nice Palo Alto hotel. Met up at one of the out locations, Alpine Road, where I met my boss Ed. Sussenguth.

I got to work on the design of an input/output processor for keyboard terminals. A processor that could sustain 10.000 such terminals online! Every Monday Gene Amdahl would spend some 3 hours with the group – the larger part of which was researching cache storage issues.

But it all lasted less than 3 months! IBM canceled the ACS/1 project that spring.

Ed. Sussenguth gently informed the group, advising each of us as to a next job at some IBM place: he shipped me off to IBM Research!

An Evaluation

And I never really got to design anything at ACS, let alone understand what the design could be! Simply: I did not really have the proper qualifications for the job!

2.7 IBM Research, San Jose, July 1969 – March 1973

So that is where I started on July 1st, 1969. 40 kms. down the road from Palo Alto.

At IBM Research, then first located in building # 25 – a beautiful, but small, one floor, building where each office had an own, shielded terrace, later, after some months, 5–7?, in “barracks”, in the specially built building # 28, I first, for 4–5 months, “idled” my time away, established contact with Tien Chi Chen. Across from the office, that I shared with an Indian chemistry scientist, was the own office of John Warner Backus https://en.wikipedia.org/wiki/John_Backus (1924–2007). He came down from his home every 2 weeks or so in his Volvo 1800 https://en.wikipedia.org/wiki/Volvo_P1800. One day I sort of sauntered into his office, presenting myself – by way of reference to Peter Naur. John, as always, was kind. When I asked him what the scribbles on his board was, he explained it. So I asked: in which sense did it relate to Curry’s Combinatory Logic? he replied that he did not know of CCL! Then I asked: the λ -Calculus then. Again the same answer. So he asked me to tell about the λ -Calculus. And I explained the three syntactic clauses and the semantic ones as well: α -renaming, β -reduction. Then about the CCL’s S, K, I clauses and their reduction rules. Then we walked over to have lunch at the beautiful, central lunch cafeteria. After that he took me to “our” boss’ office and asked Jim Early, “can Dines come to work with me?”. He had not asked me that! Jim Early sent John out to discuss the matter with me – and

eventually asked me: “where did I want to be 5 years from now?” Never having considered that kind of questions before I replied, after perhaps a 1/2 minute pause, “not in that chair” – looking at his’! “You go work with him, now, out!

My job for Backus was to code, in PL/I, an interpreter for his evolving FP and FFP languages, then referred to as the **RedSys**-languages. So I did so. Coded a recognizer for his context-sensitive grammars and a “finite state tree-transformer” semantics [6].

My work for/with John also took on a social dimension. We had John and Una, his wife: Una Stannard, for lunch at Del Oro Drive with great wines from Saratoga, and we were several times at their Twin Peak – San Francisco – villa, have drinks before we went local for dinner.

He still kept coming to the Lab. every two weeks, for the day.

He would call me from Home: something was wrong with my interpreter. Well, since it, so-far as I was concerned, was ‘correct’ wrt. to his syntax and semantics I had to gently suggest that – and a few hours later, often on Sundays!, he would call back, now to my home on Del Oro Drive, with new rules. I would then bicycle over, some 8 miles one way, to reboot my system with these new rules, call him, not bicycling home before he OK’ed the changes.

I started with him late 1969. By May 1972, after $2\frac{1}{2}^+$ years, he called me from home, on a work day morning: saying that I had not really been helpful and that our relation was over! Well, I went for a long walk around the IBM Homestead’s golf course, reflecting on what next. After lunch, I went back to Early’s office. He was prepared. [IBM, those days, had fine, human, managers.] He had talked with Ted Codd for him to take me on. As for John Backus, nobody had worked wit/for Ted for the last 10 years. Also he was an IBM Fellow for his work on the IBM Stretch Computer’s operating system. I had shown interest – where others had not – in his ideas on what became the Relational Database concept.

So that day I started 10-11 months’ work with/for Ted Codd.

I was first assigned a silly job: to design a human English-language oriented query language in the “style” of ‘Query-by-Example’. I was in no way “equipped” to carry out this research. How I “lingered on” I cannot remember. At one point, in the fall of 1972 we were a group of four: Ted Codd, Irv Traiger, Ken Deckert and I, sequestered at the IBM Advanced Systems Laboratory in Los Gatos, to work on *The GAMMA-0 Relational Data Base Interface Specifications of Objects and Operations*. I typed the report [3].

Then, on Thursday the 14th of December 1972 I received, in my office, next door to Ted’s, not a, but the telephone call that changed my/our 1973 life entirely. It was from Peter Lucas, from the IBM Labor in Vienna Austria. He began by remarking that he was somehow led to believe that I was on my way back to Europe – and that they, the Vienna Lab, was interested in my coming there? Would I be interested? Somewhat surprised, well, also jubilant, I said Yes, I could begin next Monday! Well, well. IBM locations were not really supposed to “steal” staff from one-another, so there would go some time.

An Evaluation

In retrospect: I did not really have the qualifications for the work John Backus expected from me – and he did not really express what he expected from me other than program a suitable interpreter for his reduction languages, which I did [rather well].

For the work, with Codd, I/[no]one, then, had the proper tools for dealing with the relational query languages: giving them a proper, formal semantics, etc., such as VDM!

2.8 IBM Vienna Lab., Vienna, Austria, May 1973 – August 1975

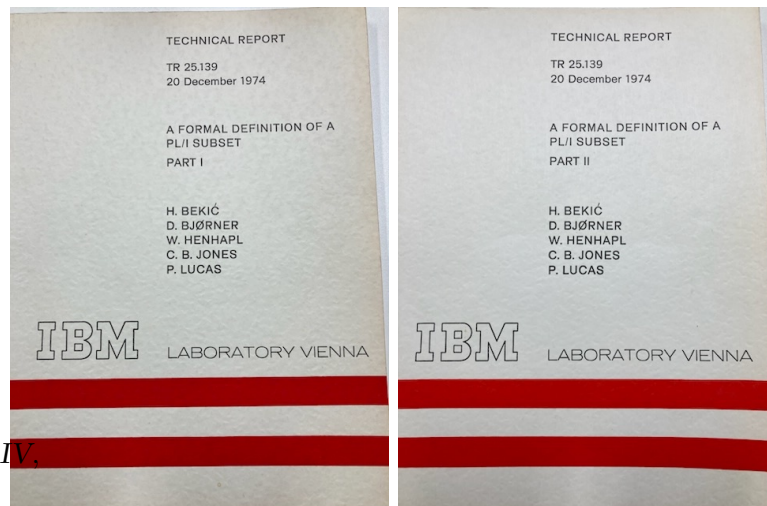
Three months later, Saturday March 3, 1973, Kari and I flew via New York, with a one night stop at The NY Plaza, and via Frankfurt, 4th of March, to Vienna. To see whether we wanted to go there! In NY we walked down 5th Ave., buying 4 copies of Stephen Toulmin and Jannik Allan: Wittgenstein's Vienna at the Doubleday bookstore, around 9:30pm! In the AUA flight from FaM to Schwechat, Vienna, I picked up a Kronen Zeitung newspaper. We were received at Schwechat by Peter Lucas. Had lunch on our way into town at a Donau river fish restaurant – a great start! In the lab. we met “everybody”: Zemanek, Walk, Bekič, Teufelhardt, Lenk, etc. The first three each got a copy of the Wittgenstein book. Then we checked in to the Park Ring Hotel, next door. With Franz Lenk we then started looking at an apartment. Gruesome! That night we did not sleep well: worrying about finding a nice apartment. Luckily I had picked up the Kronen Zeitung. It had an advert from a dealer in Gumpendorfer Straße, and their apartment, in Aufhostraße 84 was the one we took: splendid. We had 2 wonderful years there.

I started May 1st, Kari came with the children in our new Mercedes once the furnitures came from California.

We set out immediately, once I had arrived, on the work of a formal definition of PL/I without concurrency. After a week or so, the rhythm went on for more than a year: In the office, by 8am: there was the printout of the work of one of my colleagues: Lucas, Jones or Henhapl. These rotated week-by-week. We would then work on reviewing his work. By 9:30-10:00 we met at the coffee room on the 3rd floor to discuss formalization issues and the evolving specification language – handing over our marked pages. We would then correct if anything. At about 12:30 it was Mahlzeit so we were 5 or so off to Café Engländer for a warm 2-3 course lunch with coffee afterwards at Aida around the corner. Afternoon work on more formalizations. Normally we would stop work at 5pm. Sometimes, maybe twice a month, we would stay on, our wives meeting us, for a concert.

The four of us: Peter Lucas, Hans Bekič, Cliff Jones and I, every other month or so, with our wives, would go to a concert, either at The Musikverein or at The Wiener Konzerthaus, and have supper afterwards.

When the PL/I definition [2] was finally printed: Lucas gave a late September 1974 afternoon and evening party at the flat in Adolf Tor Gasse. Kurt Walk, our boss, asked, in jest, and what should we name the methods and the specification languages – to which I replied: VDM, for the Vienna Development Method, and *MetaIV*, for the fourth meta-language of *ULDI*, *ULDII*,



*ULDIII.*³

With Hans Bekič I founded the *Wiener Informatik Kreis*. We gave up registering the WIK at the *Wiener Vereins-Polizei!* *Too many signatures here and there!* For our first meeting we brought a 100 cheap, brown envelopes, gave one each to attendees on which to write their addresses, we then bought 12 groschen stamps and use these for our next announcement – the first being accomplished through the *Wiener Kybernetik Verein!* As speakers we “used” the many visitors who otherwise visited the IBM Labor: Dana Scott, John C. Reynolds, Lotfi Zadeh, etc. Our last meeting, late Spring 1975, had more than a 150 participants. Each time participants gave us a brown envelope, prestamped with their address. No ‘verein’!

Yes, Dana Scott visited the IBM Vienna Lab several times in my years there. Would give a talk: on the emerging type [he called it domain] theory. Third floor seminar room. In his beautiful handwritin he would fill the white boards.

Heinz Zemanek was mildly “furious” upon hearing of the first meeting. He had been on one of his many IFIP etc. travels at that meeting. *It was not in the interest of IBM that we had formed such a ‘verein’.* *It could evolved into something that maybe the government sought advise from, contrary to IBM wished!* After that last meeting we gave him the complete address list, more than 200 – with which he then proceeded to form the *ÖCG, the Österreichische Computer Gesellschaft – the Austrian Computer Society*.

And “alone” I founded the *Wiener Essens Kreis* where, once a month we, at the Lab. could meet after work and eat! It still exists!

Peter Naur [DIKU] invited me to give a talk in November 1974 in the Danish Computer Society [*Dansk Datalogi Selskab*], and Peter Johansen invited me to become a visiting professor at DIKU for the academic year 1975/1976. So I went to Kurt Walk, mid May 1974, to resign. Heinz Zemanek “came down” from the 5th to the 3rd floor, somewhat agitated: I should have informed him first! Well, the IBM line was: first Your boss. We started packing. Got ‘Denmark’ van line to transport our goods, incl. the Proksch mignon concert piano, home. We, Kari, I and the children went for a farewell tour of Austria, in early June, ending up in Salzburg from where they continued driving “home”. I went back to Vienna for two+ more months. Late June I had to pick up Charlotte’s examination document: She had 1’s in all subjects, i.e., was deemed head-of-class, so I was last to be called up at the “graduation” ceremony!

Often, during lunch breaks, I would saunter around the 1st *Bezirk*, visiting, briefly, one or more of the many art galleries. To buy, 50 shilling, some 3 US\$?, the current exhibitios’ poster: Ernt Fuchs, Arnuf Rayner, ...! All this, not a a “touristy” endeavour – but to soak-in the *Wienese!*

An Evaluation

At the IBM Vienna Lab. I woke up! The two years there dictated the rest of my professional life.

2.9 DIKU, Copenhagen, Denmark, 1975–1976

So the decision to accept the one-year guest-professorship was then also a decision to return to Denmark. In January 1975 we bought the house we have now lived in for over 50 years.

³Images courtesy Cliff B. Jones, 14 Feb. 2025

During April–September 1975 we had the 1902 villa rather completely remodeled and moved in August 7, 1975.

I got a nice office at the *Datalogisk Institut, Københavns Universitet in Vermundsgade* – and a secretary: Annie Rasmussen. She typed up, on an IBM typewriter – those days !!! – my lecture notes. And the year went by: fall 1975 and spring 1976. Just before Christmas a colleague, Torben Zahle, happen to mention that a position as full professor in Computing Science at the DTU had been announced in the *Ingeniøren* – the weekly for “academic engineers”! So I spent Christmas writing up an application and having three copies made of all relevant papers. I lecturing right after New Year, so Kari and Nikolaj “ferried” three boxes of application stuff on a sleigh in heigh snow on January 4 [to a taxi which could not come up/down our road] to DTU. On May 5, 4 month later, prof. Christian Gram telephoned me to announce that I had been chosen!

2.10 DTU, Denmark, Sept., 1976 – March, 2007 – 1st Period: – June 1992

So this, the 31 years at DTU as a full professor, then became my professional life’s high point. And I enjoyed it tremendously: the students, the lectures, the colleagues, the writing of lecture notes, articles and books!

An Evaluation

I never really became a good PhD advisor – not really myself being a proper scientist in those years!

But I and my MSc. students “scraped through”!

And I never really was good at obtaining Danish government (nor Danish industry) grants.

But my colleague, Prof. Christian Gram, saw my potential: he took the initiative to form DDC, see Sect. 2.11. He lead; I provided the ammunition!

MORE TO COME

2.11 Dansk Datamatik Center, Fall 1979 – Summer 1989

TO BE WRITTEN

2.12 The Govt. Informatics Commission: Nov. 1982 – Spring 1984

I was in Beijing, had Sunday lunch with the Danish Ambassador, who had invited me. I knew him well, but ‘an invitation’ for lunch? Well, he had something to inform me: The newly elected Danish minister/secretary for Education, Mr. Bertel Haarder, were inviting me to chair a government commission on, as he called it, *Informatics*.

I returned home, anyway, the next day, and had a meeting with his excellency. (His wife, Birgitte, was a colleague of my sister at the *Ingrid Jespersen School* and his parliament colleague Christian Rovsing⁴ had recommended me.)

He suggested one name, the then CEO of the then Jutland Telephone Company, JTAS. I think it was Richard V. Relsted. Otherwise I was “free” to choose and pick!

MORE TO COME

⁴CR and I shared an apartment in Stockholm in 1962-1963 when he was also at the IBM Nordic Labs.

2.13 UNU/IIST, Macau, July 1992 – June 1997

In January 1997 I was on my way to China, in Tokyo, at The Imperial Hotel. Charlotte having been in Beijing in the fall, had been in Hong Kong and Bangkok over the Christmas week came up from Kyoto. In the early evening the room phone rang: it was someone from the United Nations University HQ in Tokyo: Was I available for an exploratory meeting of 5-6 people, early March in Macau? Oh, yes! So Charlotte having just been in Macau – where I had not been – exclaimed Ah!

So a group convened of people related to computer science in the early days of March 1997: Prof. Mme Wesley Tanakovic, the convener (former chairman of the UNU Council), Prof. Ji FuSheng (Chinese ministry of Science and Technology), a professor from Lisbon, one from OECD in Paris (Portuguese), one from the World Bank (a former director, Tun Tin), one from University of Macau, and me!

We were to discuss the prospects for a possible UNU Institute for Software Technology. Mr. Tun Tin had, on the instruction of the UNU Rector (Hector Gurgulino de Souza, Tokyo), analyzed which country in The Far East, one with Chinese “roots”, was prepared to co-fund, with China, such an institute. Macau (then under Portuguese administration) had expressed interest. Monday–Wednesday. Tuesday afternoon no clear idea as to what such a UNU *Research & [post-doc] Training Centre* had emerged. In the evening I concocted a kind of consensus of what little there was. I presented that the next morning. And the meeting concluded. I flew home Wednesday evening.

In May 1999 I was in Rio De Janeiro. In the evening the day after my arrival I had dinner with several colleagues from PUC: the Pontifical Catholic University of Rio. One of the participants, Prof. Sernadas, excused himself early: He was off next day via London (visiting David Parnas) to a UNU meeting in Macau! I had my secretary send David my March 1997 sketch which he gave to In March 2001 Prof. Sernadas.

Late March Prof. (Mme) Wesley Tanakovic telephoned me at Work: “*Was I interested?*” Well, there had been a one page advertisement for the directorship of UNU-IIST in the *Economics* journal. One I never read. So I said that and that if they wanted me they could call!

Very early May the vice-rector of UNU called me at work and asked of my interest – for, if so, they needed an application. As for the application, I said, they could pick up my CV two floors below theirs, with Dr. so-and-so, at the Nippon Unisys HQ – where I had given a well-remunerated talk 1/2 year earlier! After an hour or so he called back; Could I come to Tokyo next week.

And so it was that in mid May I accepted an offer. I flew home via Macau and Beijing!

MORE TO COME

2.14 DTU, Kgs.Lyngby, Denmark, 1976–2007 – 2nd Period

I returned to “my chair” at DTU, from UNU/IIST, the last week of June 1997 – in time to see, at 6pm Danish time, on June 30th, the “handover” ceremony of HongKong to PRC.

While I was on the 5 year state “leave-of-absence” the institute had hired NN to give “my lectures”. When I returned, the head of department, Robin Sharp, let NN continue those “lectures” – and so I was effectively cut off from basically three semesters of three different kinds of lectures! NN gave only one course, every fall. In my mind it was a serious mistake: the course and preventing me from giving those lectures. I was too meek to abide. NN’s

lectures were more about the RSL as a specification language: the importance of placing “;” (semicolon) at the right places were somewhat over-emphasized! Over time, since 1992, NN has published very little. Usually the same kind of paper: some proof in connection with software for railway interlocking!

Nevertheless: I continued to develop my ideas on proper software engineering and published, in 2005–2006, the three volume [7]. One volume, the first, obviously, was “finished” in 2004/2005 while I was at NUS. I used these volumes also for my 2006 lectures at JAIST – where Liu BoChao led a group of Chinese PhD students in translating all three volumes [12, 13, 14] and saw to it that they were published by QingHua Univ. Press together with [their] english versions [8, 9, 10]!

MORE TO COME

2.15 NUS, National University of Singapore, 2004–2005

MORE TO COME

2.16 JAIST, Japan Adv. Inst. of Sci. & Tech., Kanazawa, 2006

MORE TO COME

2.17 Hagenberg: February–April 2007

One of the strangest things happening to me!

When in Japan I was e-mail-contacted, via Prof. Georg Gottlob, by Prof. Bruno Buchberger. We met, in Linz/Hagenberg, in connection with my chairing an AE Informatics section event in Budapest in Sept. 2006. He wanted me to direct a school of informatics next to his RISC: Research Institute for Symbolic Computation at Hagenberg. A contract was signed in Nov. that year. And we moved there straight after our return from Japan! I spent February writing up brochures for the school.

MORE TO COME

2.18 Retirement: 2007–...

This document is being written over Christmas/New Year 2025/2026.

It was really, so it is my belief, only in my retirement, that I truly became a scientist! The ideas and practice of rigorously describing domains, in narrative, i.e., informal, and in formal form, were already practiced in the formal modeling of PL/I (1973-1974, IBM Vienna Labor), CHILL and Ada (early 1980s at DTU and DDC), and – “full blast” – at UNU/IIST, with Søren Prehn devising some beautiful abstractions in connections with the China *Railway/Running Map* project. But, for me, it was not until around 2010, that I seriously began thinking about a systematic approach i.e., a *method* based on *principles*, *procedures*, *techniques* and *tools*, to guide the domain analyzer cum describer in the construction of domain models.

A breakthrough⁵ came around 2008/2009 and was first presented at Tony Hoare’s 75th Fest in May 2009 [11] – with further refinements in [24]. A first attempt at “full-scale” domain development – along these lines of Mereology and CSP – was delivered in two talks in Kiev in 2010 and published accordingly [16]. The further development took some years and resulted in a number of papers and a book: [26, 27, 29]. Numerous papers (as well as reports) have presented various further developments/refinements on the ‘method’: papers: [23, 22, 28, 33, 30, 1, 36] and reports: [18, 20, 38, 21, 25, 32, 35, 37].

⁵– relating Douglas T. Ross’ thoughts on mereology to Hoare’s CSP

The book⁶ [29] was prematurely published: It presented an unnecessarily complicated “story” on *compound parts* and was not precise on certain technicalities: type names and `RSL+text` as types. So a simpler version of the book was written [31]. This “book” is presently being translated into Chinese by Dr. Yang ShaoFa of the IoS/CAS: the Institute of Software of the Chinese Academy of Sciences and into Russian by Dr. Mikhail Chupilko of IS/RAS, the Institute of Systems Programming of the Russian Academy of Sciences.

3 In Closing

MORE TO COME

A Summary

Our field – computer & computing science, in my mind – has fossilized! New approaches to computing are basically ignored: the “producers” of computer & computing science papers are stuck in what their PhD advisors “thought”. Many computer & computing scientists are becoming increasingly “mathematical”. Programming methodology (computing science) is disappearing.

I state all of this in the following context. For 15 years I have been advocating a new approach to software development [15, 17, 19, 26, 34, 30, 36]: *Domain Engineering*. I am unashamed enough to consider this work significant and new. But nobody really takes notion. So be it. I am not disappointed. Just somewhat baffled. Hence this ‘Summary’ box!

An Observation

Upon reflection I have, in recent years, sometimes thought: *Why has so many people, in my professional life, been so kind to me,?* Yes, I have had that thought. The professional people I have in mind were: *Cai Kindberg, Gunnar Wedell, Carlo Santacrose, Lotfi Zadeh, Ines Wesley Tanaskovic, ...* and others.

Another Observation

I was, for a short while, “manager”: project manager, of a small group of 6 mostly Swedish engineers from the IBM Nordic Labs., Stockholm: November 1964–August 1965. “We” were successful in developing, in a short time, a *terminal control adapter*, that is a low (135 bit/sec.) tele-communications “gadget” to be part of the IBM 1800 control computer.

Later I had the responsibility for a so-called macro-language etc. design. That was when the IBM Labor PL/I project was over: Late 1974–July 1975. I had no inkling, really, of what a macro-processor was! And was relieved when it was over. It was over when I left!

During the 1980s I was, “nominally” chief scientist of DDC. The DDC aspects that I devised and “managed” were very successful: The CHILL and Ada compilers, the Formal Definition of ADA (an EU ESPRIT) project, the design of RAISE.

I had my prime time as a manager when I lead UNU/IIST.

On that background, the DDC and the UNU/IIST work, it was/is interesting to observe, that, when I returned to the DTU after Macau, I was never asked to lead any part of my department/institute!

⁶The book was “derived” from my Dr. Tech. thesis

Well, and I never desired to.

Who would want to lead a department where every assistant and associate professor felt themselves primadonnas?

Yet Another Observation

Two Lives: For many of us two lives challenge our daily decisions: the family life and the professional life. I am naïve enough to think that I have squared these two off reasonably well. Kari helped me. She was always there! Yes, I traveled a lot. And in later years she was almost always with me! But there was never any doubt: Family did come first – although the situation – confronted with having to make a choice – never really arose.

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