1.1 The gang of four

Martinus Veltman

The history of the NIKHEF has been published several times, in particular there is an overview due to Tiecke that may be found at the NIKHEF website[1]. Yet there is a strange gap, namely the period 1973-1976. What happened?

Let me first briefly review what happened until 1973. Concerning high energy physics people were often holding meetings that in general did not result in any practical progress. The reason for this lack of progress had to do with the integration of the various groups. Basically, there were the following groups:

- The Amsterdam group, located in the Zeeman laboratory directed by Kluyver;
- The Nijmegen group under the direction of Van de Walle;
- A group under the direction of Sens working at locations such as CERN;
- The Amsterdam nuclear physics group, located in the IKO.

In 1965 the NIKHEF was essentially born, to be built at the present location. Other than that nothing happened. In 1968 or so there was a lot of commotion, because the RAWB (a committee advising the government) brought out an advice against participation at CERN and encouraging nuclear physics, in particular the IKO, the Amsterdam institute for nuclear-physics research. Noteworthy members of the RAWB were Casimir (Philips) and Böttcher (Chemistry, Leiden). Philips had been involved with the IKO, giving them a cyclotron. Personally I was flabbergasted that Casimir was so anti-CERN. I tried to organize opposition but I was very ineffective. I had a friend who had been active in the underground during the war, and he was one of the founders of the daily journal *"Het Parool"*. He then used his influence there, resulting in an interview of me done by J.J. Peereboom (not the sports journalist). I think Peereboom never really understood what I was telling him. For some more details see an interview of me by Wigmans (NTvN **B49**, 3 (1983) 97), as well as the ensuing reactions.

At that time (1968) CERN was about to construct the Intersecting Storage Rings. Not long thereafter the planning for the 300 GeV machine (the SPS) was started. Meanwhile, another committee, the WRK (Scientific council for Nuclear energy) led by Van Bueren (Astronomy, Utrecht) came in 1970 with a radically different advice: support CERN and the construction of the SPS (see Fig. 1), coordinate all high energy and nuclear physics activities. This meant in particular coordination of the Amsterdam high energy group and the Nijmegen group. In 1972 the government gave in principle permission to start with the NIKHEF, provided the

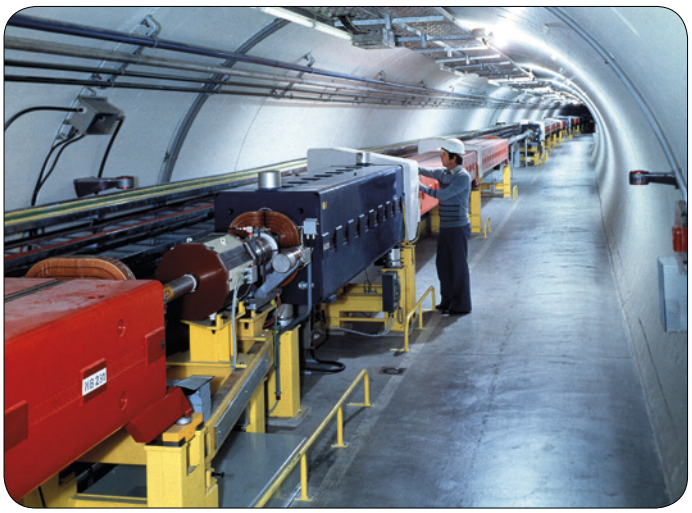

Figure 1. Last stage of preparation in the SPS tunnel at CERN (April 1976).

recommendations made by the Van Bueren committee were implemented. This turned out te be very difficult. In particular, Nijmegen had invested heavily in high energy physics, and was not really prepared to make concessions on that.

Funny things happened. Brinkman (Experimental physics, Groningen), bypassing and upsetting everybody, succeeded in getting a cylotron in Groningen that started operation in 1970. Furthermore, there was a plan for the construction of a 300 MeV linear electron accelerator (MEA) in Amsterdam. In those paternalistic days (prior to 1970) physics was run by Casimir and De Boer (theoretical physics Amsterdam and then chairman of the FOM council), and De Boer had bulldozered the MEA proposal through a hearing in Utrecht. I am still mad when I think about that meeting. I had brought in Telegdi (Experimental physics, University of Chicago) as foreign expert, and De Boer tried to effectively block that by insisting that the language at the meeting should be Dutch. Telegdi responded by asking if he could answer in English. Both De Boer and Casimir were clearly in favour of expanding nuclear physics rather than high energy physics. To this day I find that unbelievable. Neither of them ever did nuclear physics.

So what now? The government had approved the NIKHEF and in principle the money was available, but the participants did not seem to be able to reach an agreement. Effectively nothing happened.

This article deals with the time that the official name of the institute was spelled 'NIKHEF' in capitals. We preserved that spelling in the text, although since 2007 we write 'Nikhef'.

1. http://www.nikhef.nl/fileadmin/Doc/Docs%20%26%20pdf/historynikhef.pdf

Dramatis Personae

Prof.dr. J. de Boer, *professor of theoretical physics Amsterdam 1946-1981, president of the FOM board 1959-1981*
Dr. A.A. Boumans, *director of FOM 1963-1984*
Prof.dr. H. Brinkman, *professor of experimental physics Groningen 1950-1980, director of KVI 1968-1972*
Prof.dr. C.J.F. Böttcher, *professor of physical chemistry Leiden 1947-1980, co-founder of the Club of Rome, first president of the RAWB 1966-1974*
Prof.dr. H.B.G. Casimir, *professor of theoretical physics Leiden 1938-1942, director and member of the board of Philips 1946-1972, member of the Curatorium of IKO 1946-1972, president of KNAW 1973-1978 and EPS 1972-1975*
Prof.dr. C. Daum, *professor of high-energy physics Twente 1991-1996*
Prof.dr. A.N. Diddens, *professor of physics Leiden 1979-1994, first director of NIKHEF section H 1976-1982*
Prof.dr. P. Duinker, *professor of experimental physics Nijmegen 1988-2001*
Prof.dr. D. Harting, *professor of experimental physics Amsterdam 1964-1988*
Prof.dr. W. Hoogland, *professor of experimental physics Amsterdam 1988-2005, director NIKHEF section H 1983-1988, scientific director CERN 1989-1993*
Prof.dr. E.W. Kittel, *professor of experimental physics Nijmegen 1973-2003*
Prof.dr. J.C. Kluyver, *professor of experimental physics Amsterdam 1960-1986, director Zeeman laboratory 1960-1980, secretary of the Curatorium of IKO 1960-1980*
Prof.dr. G. van Middelkoop, *professor of experimental physics VU Amsterdam 1979-2001, director NIKHEF section K 1983-1988 and NIKHEF 1996-2001*
Prof.dr. A. Pais, *professor of theoretical physics in Princeton 1950-1963 and at Rockefeller University in New York 1963-1988, science historian*
Prof.dr.ir. J.C. Sens, *professor of experimental physics Utrecht 1966-1993*
Prof.dr. H.G. van Bueren, *professor of solid state physics Delft (1962-1965) and scientific director IRI Delft (1962-1965), professor of astronomy (1965-1979) and astrophysics (1979-1981) Utrecht, president WRK 1967-1975, president RAWB 1979-1989*
Prof.dr. M.J.G. Veltman, *professor of theoretical physics Utrecht 1966-1981, Ann-Arbor 1981-1996, Nobel Prize physics 1999*
Prof.dr. R.T. Van de Walle, *professor of experimental physics Nijmegen 1963-1996*

Figure 2. Gang of four. From upper left clockwise: Dick Harting, Wolfram Kittel, Hans Sens, Tini Veltman.

Then, somewhere in 1973, Sens visited me in my office in Utrecht. He proposed to make a committee and asked me to be part of that. It was the strangest thing. The committee was not proposed by anybody else, there was thus no task description and finally, what did I have to do with it, being a theorist? In retrospect I think that I was needed to act as a buffer between the parties. Personally I was somewhat reluctant, because I had just gone through a bruising experience with two committees (I was the chairman of both), namely one to reform the physics teaching program in Utrecht, and one about getting a new computer and initiating a new institute (the Academic Computer Centre Utrecht) running that computer.

However, I accepted. Sens went ahead and asked the FOM to provide us with a meeting room. Furthermore, he invited representants from Amsterdam and Nijmegen, namely Harting and Kittel, respectively. Kittel joined in March 1974 the experimental high energy group of Van de Walle in Nijmegen. Harting became our chairman. And so the first meeting was held in Utrecht, in a room in the FOM building. I recall it as a weird thing. Here we were, without task, talking in the wind and who is going to listen to us? Somewhere in the beginning we (?) organized a big meeting for everyone interested. This meeting was held in the Frommer Hotel at Schiphol Airport. There, Hoogland and others presented their plans. I am unsure about the date of this meeting. Perhaps as early as 1973. But let us go back to the committee: Sens, Harting, Kittel and myself (see Fig. 2).

Well, there are no notes of the meetings and I do not remember how things went in detail. Both Sens and Harting are no longer available, which leaves Kittel and me, and Kittel's memory is rather vague as well. I do not think all participants mentioned were present in the first few meetings. Anyhow, let's continue. Basically, we were acting as if we were running NIKHEF-H,

NIKHEF's high energy section. Gradually, over the course of several meetings the powers higher up became interested. So much so, that in 1974 an interim governing board of the NIKHEF was initiated, with Brinkman as chairman. I think that I was present at the meeting were this was done because Boumans, then FOM director, remembers some anecdote involving me: it seems that I supported Brinkman on the ground that his manipulations leading to the Groningen machine showed that he was able to achieve things. One of the actions of this board was to call us the WPC (Scientific Program Committee) and make us official, giving us the task to develop a scientific program. And so we did. In fact, we were more or less acting as if we were the directorate of NIKHEF-H. I believe that in the interim board very little physics was ever discussed.

The WPC committee was a good one. I can best quote Kittel here: *"I think that I learned a lot in the WPC. The discussions were always friendly and there was open and frank collaboration but nonetheless the committee was very businesslike. In fact, I have never encountered another committee that worked as well as the WPC".*

What did the WPC do? We talked often about money. I vaguely remember that we talked about a NIKHEF-H budget of 10 million guilders. A scientific collaborator costed about 100,000 guilders for salary and equipment. First, we discussed a lot about the money going to BEBC (the Big European Bubble Chamber), ACCMOR (the collaboration involving a group in Amsterdam led by Hoogland) and CERN. But secondly, we initiated new activities. Without any attempt at completeness some will be mentioned here.

We felt that we should develop some activity at DESY (Hamburg) and we asked Duinker to become active there. See his biography titled *"Zwanenzang"*[2] (in Dutch). He joined the MARK-J experiment of Ting. That collaboration later formed the core of the L3 experiment at the LEP electron–positron collider at CERN.

Kittel proposed the NA22 experiment. This was a hybrid experiment in a 250 GeV beam, involving a fast bubble chamber with 40 meter downstream a lot of electronic apparatus. The NIKHEF-H invested much money in large drift chambers exploited at CERN. That experiment, for which Kittel was the spokesperson, led to a large number of publications, high up in the citation lists.

Later on, the WPC also discussed the NIKHEF-H building plans. Harting was chairman of the construction committee, with Daum as a member doing much of the actual work (see Fig.3).

2. http://www.nikhef.nl/~d82/zwanenzang.html

To my knowledge nuclear physics – the realm of NIKHEF section K – was never discussed in the WPC.

17 May 1975 the various parties signed the NIKHEF agreement. Hoogland told me about the difficulties to get everybody to sign. Personally I remember Van de Walle rather sourly congratulating the Amsterdam people with their extension of the Zeeman laboratory. I must add that I truly appreciated the fact that the Nijmegen people in the end decided to sign the agreement.

At the WPC we discussed about the director and proposed Sens, with the added restriction that he would still spend half the time at CERN. Somewhere in that period I discussed with Pais, trying to persuade him to come back to the Netherlands and be director, but he declined. He was busy writing his book about Einstein. In the end, 1 July 1976, without going into details, Diddens (originally from Groningen then employed by CERN, not from Amsterdam or Nijmegen) became director. The WPC was replaced by another committee created by the director. And that was it.

In retrospect, both Kittel and I believe that the WPC did put NIKHEF-H on the correct physics track. We did not bother to make official notes, and in fact, in an overview by Harting about the past and future of the NIKHEF (NTvN **A34** (1977) 39) the WPC was not even mentioned! Perhaps there is still some information hidden in the FOM archives deposited in the Noord-Hollands Archief in Haarlem, but I leave the task of looking it up to someone else. There is only one thing I like to say: in this kind of things if you first make the physics clear then eventually the rest will follow.

I would like to thank Kittel, Van de Walle, Duinker, Daum, Diddens, Hoogland, Van Middelkoop, Gaemers and Boumans for their help in trying to reconstruct this part of the actual history of the NIKHEF.

Figure 3. Nikhef-H building, as it was in the early 1990s.