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HISTORY OF THE DUTCH-BELGIAN AEROSOL SOCIETY

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INTRODUCTION

The Dutch Belgian Aerosol Society (DBAS) was founded as a nonprofit professional organization for scientists and engineers who wish to promote and communicate technical advances in the field of aerosol research. The society strives to provide a national forum whereby various groups in Belgium and the Netherlands involved in different aspects of aerosol research can exchange information and coordinate their efforts.

HISTORY

The history of the Dutch Aerosol Society started in the early 1970s when the research activities on aerosols in the Netherlands were rather disperse. In this period there were no official bodies to study aerosols at the technical universities. Only some informal contacts were set up between institutes such as the Reactor centre of the Netherlands (now called ECN), the chemical lab of TNO and the Delft Interuniversity Reactor Institute. To further the interdisciplinary cooperation and exchange of information in all aspects of aerosol research Joop van de Vate, together with Foke Oeseburg, George Ferron and Adrie Plomp, set up a Dutch Aerosol Working Group. Figure 1 shows such a work group.

These concerned professionals recognized the importance of aerosols in a number of areas, including air pollution, industrial hygiene, atmospheric sciences, clean room technology, and nuclear safety. The main focus was to promote by means of meetings, the spread of information on an interdisciplinary basis among the various aerosol groups. On a regular basis, closed workshops on specific subjects were organised for a limited group of researchers where one aerosol related topic was talked through in detail. At these meetings, subjects such as test methods for dust filters, deposition of coarse dust, lung deposition models, the generation of mono-disperse aerosols and measurements with aerosol centrifuges were extensively discussed both in theory and practice, and experience with certain apparatus was exchanged.

The fledgling organization quickly attracted a core group of scientists who were actively engaged in these areas and in January 1972, a first meeting was

held with some 10 professionals. At that time people from other institutes had joined the 'Aerosol Working Group'. These included the School for Agriculture in Wageningen and the Study Center for Nuclear energy in Belgium. Subsequently, on the 24th of October, 1972 the Dutch-Belgian Aerosol Society was officially founded during the first meeting at the Netherlands Energy Research Foundation.

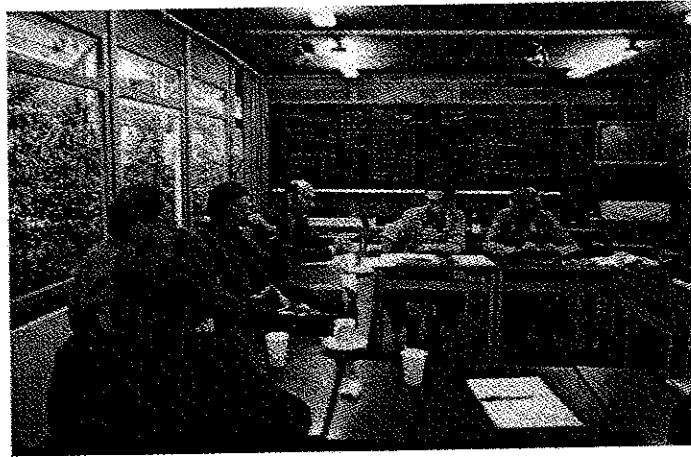


Fig. 1. A meeting of the Dutch Aerosol working group at ECN. At the corner is Joop van de Vate with Adrie Plomp at his right and George Ferron at his left

In the early 1970s, the activities of the working group revolved around laboratory simulations and theoretical studies for aerosol and environmental physics of atmospheric processes. In the late 1970s the working group started to do large cooperative projects, including field studies for the comparison of sampling methods for dust.

Figure 2 shows the instrumental set-up for a field campaign of six weeks for dust measurements near a field station of the NATO air base in Deelen. The experimental set-up contained several dust samplers, including high and low volume samplers (from Strohlein and Andersen), May tunnels and LIB samplers. A homogeneous line pattern of a monodisperse aerosol was obtained using five spinning top generators lined up in one wind direction. In order to control the aerosol loading, several rotorods were installed in between the other dust samplers in combination with SF₆ tracer gas bottles.

Extensive measurements were also obtained from a comparison campaign at the Belgian nuclear institute (SCK) for the determination of the response function of nephelometers. The performance assessment was validated by

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measuring the absolute concentration and the size distributions of the generated aerosols. These data are being used to increase the understanding of the applicability of nephelometers under controlled conditions of size range and provided additional information for scientific contributions at one of the conferences of the Gesellschaft für Aerosolforschung (GAeF).



Fig. 2. The apparatus for a measuring campaign at the airport of Deelen

A noteworthy technical collaboration within the aerosol society is an extensive comparison of optical particle counters under conditions of normal operation. In this experimental study the efficiency of several conventional optical particle counters was determined by means of an independent measuring technique, namely, the combination of point-to-plane electrostatic precipitation and electron microscopy. Data collected from these measurements provided the basis for a scientific contribution published in the *Journal of Atmospheric Environment*.

After a large expansion of the working group, it was decided to redefine the Dutch Aerosol Working Group as a study circle, 'Aerosols'. The main reason for this transformation was the multi-disciplinary character of this new group. Besides the chemical, physical and engineering aspects of aerosols, which were dealt with in the aerosol working group, there was also the need for the input of biological and medical expertise dealing with bioaerosols and health aspects. Consequently, in 1975 the Society became part of the Dutch Foundation of

Materials Research. Its members (~400) were mainly researchers from government or government-related R&D institutes and universities. To join this association for material science the aerosol working group had to announce the merger in an international aerosol journal. The notice was published in the *Journal of Aerosol Science* in 1976.

The aim of the new foundation was to stimulate networking among leading aerosol researchers and promote the effective exchange of information at national and international levels. This included the intensive collaboration with the GAeF, which was done mostly at the annual GAeF conferences. Besides the regular workshops, an annual national meeting was held that provided an open forum for scientific communication and introduction of new achievements on research methods and instruments. In addition, different joint projects continued with research groups from various institutes and universities.

By the end of the 1970s the focus gradually shifted to air quality aerosol problems. Within this scope the phenomenological description of aerosol air pollution problems such as particle formation and modeling of atmospheric aerosols was highlighted instead of measurement and basic aerosol science. In line with this development, at the beginning of the 1980s the Dutch-Belgian Aerosol Society affiliated itself with the Dutch Clean Air Society. By that time there were some 450 members in the combined society.

At the beginning of the 1990s, an integrated, interdisciplinary approach to environmental issues gradually emerged, implying a shift away from the separate handling of the various compartmentalized pollution problems such as air, water, and soil. The industrial application of aerosol science to ceramic materials and computer chips, for example, gradually increased due to the increasing participation of technological universities. At that time the synthesis and measurement of ultra-fine particles became a frontier of aerosol science. At the Technical University of Delft new research was carried out on the synthesis of SnO₂ particles by electrospray pyrolysis. In 1993 the Dutch Aerosol Society, together with the GAeF, the TU-Delft and the Research School for Fluid Dynamics sponsored a workshop on the synthesis and measurement of ultra-fine particles in gas flows. This workshop brought together scientists and engineers working in the field of aerosol dynamics, solid state physics and chemistry at the nanometer scale. The motivation for this workshop was that, aside from the well-established applications of aerosols, there is a strong research interest in developing new vapour phase processes for the manufacture of structural and electronic ceramics, nano-phase materials, fullerenes, catalysts and superconductors. The challenge is to engineer size distributions in a desirable range for the application of interest.

In 1996 the DBAS, under the chairmanship of Jan Marijnissen, hosted the European Aerosol Conference (EAC) in Delft, and Fig. 3 shows the cover of the programme.

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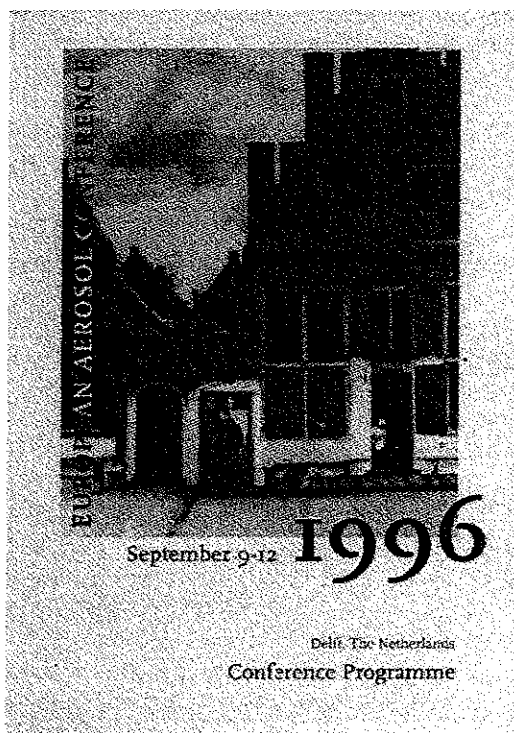


Fig. 3. The cover of the conference programme for the European Aerosol Conference of 1996 held in Delft

Once again, in 1998 the Dutch-Belgian Aerosol Society moved, now to the so-called Dutch Environmental Society. Membership decreased somewhat, reflecting the decreased social interest in environmental politics. The officers of DBAS elected in 1997 are: Patrick Berghmans, Chairman, Jan Marijnissen, Vice Chairman and Gabrie Meesters, Secretary.

Currently, the activities of DBAS have shifted towards more theme-oriented meetings. The society has regular meetings and conferences for members that include presentations on many different topics of aerosol research. These include aerosol chemistry, instrumentation, material synthesis, pharmaceutical aerosols, filtration/separation, atmospheric sciences, combustion aerosols, biological aerosols and fine dust. These conferences provide the potential of interaction and discussion and offer the opportunity for workers in different aerosol-related fields to meet, present and discuss their work. In addition, one-

day seminars are organized on a specific topic (such as fine dust, coarse dust, particle shape, aerosols and electrostatic charge, and a continuing series on fine dust) in order to make a pool of expert knowledge available.

During the last five years we have seen a shift in interest towards medical, biological and pharmaceutical aerosol research. Therefore, the society has close co-operation with a medical society, and every year a joint meeting takes place to discuss subjects of mutual interest.

Today the number of members is about 200, with professionals and students from academia, government, and industry having backgrounds from different disciplines that work with aerosol science. This includes physicians, physicists, engineers, chemists, respiratory care practitioners, mathematicians and others.

Every five years a directory in the form of an almanac is updated and published. It contains information on the membership, their affiliation, areas of interest and equipment in use.

Today the aerosol society aims to provide an information service on all forthcoming events on aerosol developments and to act as a link between other aerosol associations around the world, particularly those in Europe. The Society is one of the six founding associations of the European Aerosol Assembly (EAA) and maintains good contacts with other national and international bodies regarding areas of common interest in aerosol science.