Verslag van de bijzondere zitting
van de Afdeling Natuurkunde
op vrijdag 16 juni 1995

Uitreiking van de Buys Ballot Medaille
aan prof. dr. V. (Ram) Ramanathan, die bij deze
gelegenheid de Klimaatlezing 1995 uitspreekt.

Voorzitter de heer P.J. Zandbergen, president de heer P.J.D. Drenth, secretaris de heer K. Vrieze.

Buiten een aantal leden der Akademie zijn verschillende autoriteiten en genodigden bij de bijeenkomst aanwezig.

De voorzitter opent om 16.00 uur deze bijzondere zitting van de Afdeling Natuurkunde en spreekt de laureaat en de aanwezigen als volgt toe.

Ladies and gentlemen,

I open this special session of the Science Division of the Royal Netherlands Academy of Arts and Sciences and welcome all of you, who by their presence express the importance of this special occasion devoted to the presentation of the Buys Ballot Medal to professor V. Ramanathan, Alderson Professor of Ocean Sciences and presently director of the Center for Clouds, Chemistry and Climate at the University of California.

Professor Ramanathan we are very happy and honoured indeed, that you have accepted to become the eleventh recipient of the Buys Ballot Medal and we want to welcome especially you, mrs Ramanathan and your family. We also want to welcome a number of distinguished guests. First of all the chairman and members of the Committee for Climate Research and some of their partners.
Prof. Schuurmans and mrs. Schuurmans, prof. Mook and mrs Mook, prof. Goudriaan, prof. Guicherit, prof. Oerlemans and the secretary of the Committee, mrs De Gier. It is well to remark that in this case the committee served as the jury for the Buys Ballot prize.

Further I welcome the representative of the Minister for Education, Culture and Science, dr. J. Marks, the chairman of the Netherlands Organization for Research, dr. Van Duinen, the representative of the Royal Netherlands Meteorological Institute, dr. Bade, the chairman of the GOA Foundation, prof. Van de Laan, and last but certainly not least as special guests of the laureate prof. Crutzen, correspondent of our Academy and mrs Crutzen and prof. Lelieveld and mrs Lelieveld.

Ladies and gentlemen,

The Buys Ballot Medal is one of the oldest prizes awarded by our Academy. It is also a rare one, since it is only presented once every ten years. Buys Ballot was an outstanding scientist of the second half of the nineteenth century, a period which re-established part of the fame Netherlands science had acquired in our Golden Age, an age which for instance saw the scientific brilliancy of Christiaan Huygens, whose death in 1695 will be commemorated later this year.

We now live in an age where people have become convinced that understanding of the processes which influence our earthian climate is vital for the future of mankind. It is therefore appropriate that the Buys Ballot Medal 1995 will be presented to an outstanding scientist, who has advanced our knowledge in this field decisively. Professor Schuurmans, chairman of the jury, will present the laudatory address, containing the reasons for choosing you professor Ramanathan as the eleventh recipient of the Buys Ballot Medal. Professor Schuurmans, may I invite you to come forward.

De heer Schuurmans zet de reden voor de toekenning van de Buys Ballot Medaille als volgt uiteen.

Mr president, ladies and gentlemen,

The Royal Netherlands Academy of Sciences has decided to award the Buys Ballot Medal for the year 1995 to Doctor V. Ramanathan.

The award was established in 1887 on the occasion celebration of the 40-year professorship of Buys Ballot. It has to be presented once every ten years to a scientist who has contributed most to the development of the science of meteorology in the preceding decade.

This is the eleventh time that the Buys Ballot Medal has been awarded. The list of the former ten Buys Ballot laureates reads as follows:

1893    Julius von Hann, Vienna
1903    R. Assmann and A. Berson, Berlin
1913    Hugo Hergesell, Strassbourg
1923    Sir Napier Shaw, London
1933 Vilhelm Bjerknes, Oslo
1948 Sverre Petterssen, Washington
1953 Gustav Swoboda, Geneva
1963 Eric Palmén, Helsinki
1973 Joseph Smagorinsky, Princeton
1982 Axel Winn-Nielsen, Geneva

The task of selecting the candidate has never been an easy one and the committee which had to select a nominee in the present early nineties found itself in no easier position than its predecessors. One guideline, however, could be used as a starting point: the scientist who has contributed most to the development of meteorology in the preceding decade, most probably was to be found in the field of climate research.

The reasons for this are obvious. Meteorology and climate research are closely linked and the latter has gained increasing attention and importance over the last decade, even to such an extent that people may question if there is still any meteorological activities outside the field of climate.

All through the eighties concern about possible influences of human activities on the global atmosphere and climate increased, culminating in actions of the UN to establish protective measures. Any agreed measures, however, have to be based on solid knowledge of the state, past behaviour and sensitivity of the climate system. The present state of knowledge is certainly still far from 'solid' and this is the reason that national as well as international additional amounts of money are spent in climate research. In view of the urgency of the problem a special panel has been established to monitor and assess the increase of knowledge and understanding at regular - say five year intervals: the so-called IPCC (Intergovernmental Panel on Climate Change).

With all these political and policy making activities surrounding the climate problem it is easily forgotten that all real progress in scientific understanding originates from the conceptual insight and hard work of individual scientists, usually working in small groups devoted to a certain well defined subject. Only in this case the right questions can be formulated and sometimes solved, allowing as always in scientific research for all types of surprises.

It is in this spirit that the committee for the Buys Ballot Medal has looked at the selection problem. Who and where is the meteorologist that did the 'real thing' in climate research of the last ten years. Dr. V. Ramanathan, Alderson Professor of Ocean Sciences at the University of California was the scientist we found. His present affiliation: Scripps Institute of Oceanography, Centre of Clouds, Chemistry and Climate.

Again the Royal Netherlands Academy of Arts and Sciences may be proud of having such a great scientist in meteorology as their Buys Ballot Medal laureate.

Professor Ramanathan

Your scientific career started many years ago in your home country India. It was developed further in the US, where you took your Ph.D. in Planetary Atmospheres at the State University of New York at Stoney Brook. The earth's atmosphere and the additional
greenhouse forcing apparently became of interest to you at or about the time that you worked at NCAR, the National Centre for Atmospheric Research in Boulder, Colorado. This was as early as 1976. From that time on we have seen the appearance of some 60 reviewed papers on the subject, all of them interesting and some of them already now being classical or nearly so.

Among the early papers, worth mentioning and strictly spoken not belonging to the 'Buys Ballot decade', are the papers with A. Augustsson in the Journal of Atmospheric Sciences in 1977 and in the same journal the paper of 1981 entitled: the role of ocean-atmosphere interactions in the CO$_2$-climate problem. In the first mentioned paper you treated the still much discussed radiative forcing of increasing CO$_2$-concentrations, while in the second you gave a detailed discussion on how feed-backs with the ocean actually work, physically. However, not only increasing CO$_2$-concentrations attracted your attention. You were among the first who stressed the potential role in climate change of trends in other trace gases, like methane, nitrous oxide, halocarbons and ozone.

Undoubtedly of crucial importance in your career has been your close relationship with the Earth Radiation Budget Experiment. As principal investigator of the NASA ERBE science team since 1979 you explored the wealth of satellite data in various ways, always, however, in trying to clarify scientific issues purely from observations or, where possible, to validate existing theories or general circulation models. Here indeed we see a similarity with the scientific work of Buys Ballot, who also found most of his inspiration in unravelling the laws behind the observations. Buys Ballot however only had the classical instruments like the barometer at his disposal, while you may work with the barometer of the 21st century, the meteorological satellite.

While the bulk of your research directly or indirectly had to do with the enhanced greenhouse effect, or in popular terms, with global warming, our committee did not get the feeling that you are a real spokesman on this subject. We did not rate this as a shortcoming, however. On the contrary, what you have to say is in your papers and a clear proof that you do not avoid showing the subject in a comprehensive way, also historically, is in your 1988 review paper in Science entitled: The Greenhouse Theory of Climate Change: A Test By an Inadvertent Global Experiment.

In recent years your work became more and more involved with perhaps the most difficult subject in the field of climate change, namely the role of clouds. In the global and annual mean, clouds cool the climate. The numbers we use are the well-known 48 W/m$^2$ loss due to reflection of short-wave radiation, which is more than the 31 W/m$^2$ gain by the thermal greenhouse effect. These numbers originate from one of your much cited papers. But what will happen under the enhanced greenhouse forcing due to man’s activities. Will clouds constitute a positive or negative feedback? Up till the present day this is a matter of much debate and fortunately much interesting scientific research. Needless to say that you are one of the major contributors to both. Recently you even have become really revolutionary by questioning our understanding of cloud radiative properties. 'A missing physics' is the subtitle of one of your recent papers. Again on the basis of satellite observations and the observed heat budget in comparison with values predicted by radiation models you arrive at possibly important conclusions not only for climate research, but for meteorology in general.
Without even having touched upon your contributions to another important subject in climate research, namely atmospheric chemistry, it is clear that your scientific work in the science of the atmosphere over the last decade or two is really outstanding. And this exactly is why we are proud to have you as the eleventh Buys Ballot laureate.

De voorzitter bedankt de heer Schuurmans voor zijn uiteenzetting en verzoekt de heer Ramanathan op het podium te komen en reikt hem de gouden Buys Ballot Medaille 1995 uit.

Hierna geeft de voorzitter het woord aan de heer Ramanathan, voor het houden van de Klimaatlezing 1995 over 'Clouds and climate'.

De voorzitter bedankt de heer Ramanathan voor zijn lezing. Hierna sluit de voorzitter de vergadering en nodigt de aanwezigen uit voor een op de zitting volgende receptie waar gelegenheid bestaat de heer Ramanathan geluk te wensen met zijn onderscheiding.