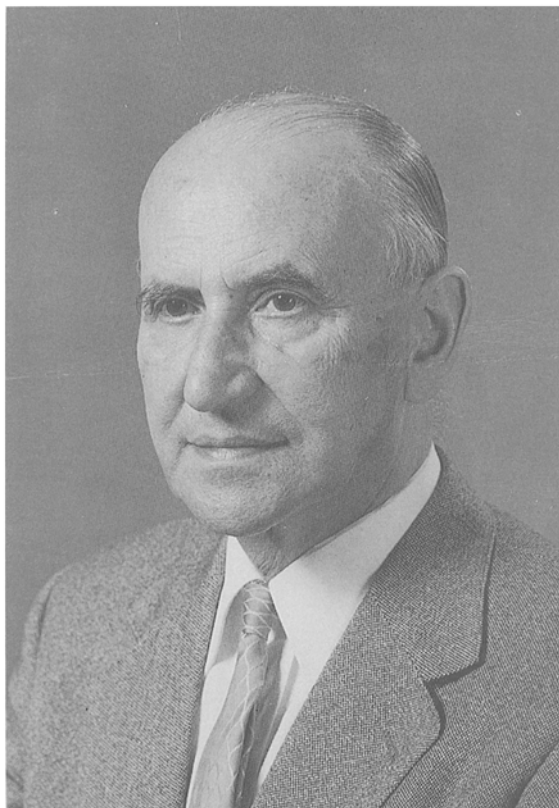


## Obituary



**Jan Bartholomeus Thomas (1907–1991)**

On 24 July 1991, Prof Dr Jan Barth Thomas died in Utrecht, The Netherlands, at the age of 84 years. With his death, his family, his friends and research companions through the years have lost a remarkable, lovable person, a gentleman by heart, who has had great merits in all the things he has done in his personal life as well as in his biophysical career.

Jan Barth was born in 1907 in Bandoeng, in Indonesia, which was at that time still a Dutch colony. Growing up as a child he learned to love the beauty of that country. The family moved to the Netherlands and Jan Barth registered in 1928 as a biology student at the University of Utrecht with botany as his major field. Apart from his study, he was involved in other student activities. The family still keeps the costume of a squire which Jan Barth wore playing a role in a mediev-

al play organized by one of the student fraternities he had joined. In 1934 he finished his study at the university and obtained the Dutch degree of 'doctorandus' and he got a (non-paid!) job as a research assistant for two years at the laboratory of comparative animal physiology under the guidance of Prof H.J. Jordan.

In 1936, Prof V.J. Konigsberger, a highly regarded botanical investigator in those days, offered Jan Barth a job as a Ph.D. student at the Faculty of Biology, Department of Botany. Jan Barth had learnt to love research and he was very good at it; so he accepted the job. As a student he had already been very productive publishing papers and even more so during his Ph.D. period. During his Ph.D. years, his open mind and eagerness to learn new things showed, and it was in those years that he started

cooperating with Prof J.M.W. Milatz from the faculty of Physics for the interpretation of his measurements on the '*Electric control of polarity in plants*', which was the title of his Ph.D. thesis. His Ph.D. work was published fully in the journal 'Extract du Recueil des Travaux botaniques Néerlandais', in 1939. On 20 March 1939, at five o'clock in the afternoon, Jan Barth obtained his doctor's degree at the University of Utrecht. At that time, it was still a custom that the fresh doctor and his two companions ('paranimfen'), dressed in their beautiful dress-suits and black hats, made a tour through the city by horse-carriage. Jan Barth must have enjoyed it, since he liked traditions and had a great feeling for style. In that same period, Jan Barth was engaged to A. Steegers and they were soon married. Shortly after his Ph.D. ceremony, Jan Barth received a grant for botanical research in the, at that time world famous, Treub laboratory, the research Institute of the Royal Botanical Tropical Gardens in Buitenzorg, Java, Indonesia.

Jan Barth and his wife left The Netherlands by boat at the end of April 1940. On 10 May 1940, The Netherlands were submerged in the Second World War by the sudden unannounced invasion by Germany. Due to the war situation, it was difficult for the Thomas family to return to The Netherlands, so they stayed in Indonesia, where Jan Barth continued his very productive research period performing investigations on tropical plants. The period was cut off brusquely by the Japanese invasion of Indonesia. Jan Barth and his wife were brought to Japanese camps. These years have given him a lot of grief and hardship although he did not speak much about it.

After the Second World War, Jan Barth returned with his wife and his daughter Tineke to The Netherlands, where his wife died in 1946. Jan Barth remarried later with M.J.W. van der Staal, or Mary, for those who learned to know the family better. Both Mary and his daughter Tineke gave a lot of joy in his life after these difficult years.

Back to research in The Netherlands, Jan Barth first started working with the well-known microbiologist Prof A.J. Kluyver, Delft. His research was about the formation of pigments in the fungus *Trichophyton*, a research which even

affected him personally, since he became infected with the fungus. Fortunately, this infection was cured quickly. Jan Barth also became involved in research about the auxin production in the green alga *Chlorella*. Prof A.J. Kluyver and Prof J.M.W. Milatz, from the faculty of Physics, both as directors closely connected to the Biophysical Research Group, which was founded by the Rockefeller Foundation, then proposed Jan Barth to take the vacancy of Prof E.L. Wassink at the Biophysical Research Group. Prof Wassink was appointed as a professor in plant physiology in Wageningen.

Jan Barth accepted this offer and he started in 1947 with his research. Ph.D. students at the Biophysical Research Group were, e.g., Bessel Kok and Lou Duysens, both involved in photosynthesis research and well known in the field later. From 1947 on, Jan Barth started his studies in the field of photosynthesis by making action spectra of photosynthesis of the photosynthetic bacterium *Rhodospirillum rubrum* to check whether this action spectrum would correspond with the action spectrum of phototaxis of this bacterium. The measurements in those days were tedious and painstaking, but Jan Barth was very meticulous and full of patience. In addition, Jan Barth was always willing to help others. His colleagues from those years describe him as always even-tempered, stimulating and full of humour.

At the end of the fifties, Jan Barth was nominated as professor. In 1959–1960, Jan Barth and his family went to the University of Illinois which in those days (and still now of course) was the haven of photosynthesis research. Jan Barth was invited to work as a visiting professor with Eugene Rabinowitch after the death of Robert Emerson. As Ph.D. students, Rajni Govindjee and her husband Govindjee were working in that laboratory as well. Jan Barth was one of the members of the Ph.D. committee of Govindjee at the University of Illinois, Urbana. Jan Barth was nominated as a member of The society of the Sigma Chi, devoted to the promotion of research in science and of the society Phi Kappa Phi.

Back in The Netherlands, Jan Barth was nominated as a full professor in 1962. On 17 December 1962, he held his official inaugural

speech entitled: *County of receding boundaries*. It handled the definition of the field of biophysics and it is still very up to date, since biophysics still is an interdisciplinary research moving into and from physics, chemistry, biology, genetics, physiology, etc.; crossing of the boundaries of these fields occurs back and forth all the time.

In the beginning of the 1950s one of us (Joop Goedheer) had also joined the Biophysical Research Group and has often told the story how Jan Barth helped him through a sudden 'disaster'. Joop was almost at the end of finishing his Ph.D. thesis and he came by bike to the laboratory. His bag containing the (only!) almost finished Ph.D. manuscript together with some sandwiches was placed against a tree. Joop had promised to bring some waterweeds from a ditch on the way to the laboratory. But Joop, a little absent-minded, had placed his bike in a labile equilibrium against the tree. Standing at the side of the ditch, he saw his bike taking its own decisions and riding without him into the water. Five minutes later he held his manuscript covered with waterweeds in his hands; the sandwiches were soaked. When Joop came into the laboratory Jan Barth helped him unveil the manuscript and supplied him with the necessary comfort and food. At the end of the day, Joop and the manuscript were saved. Such situations paint Jan Barth: always helpful. Jan Barth was always modest and honest in his dealings with others.

In the beginning of 1960, Jan Barth wrote a monograph entitled: '*Primary Photoprocesses in Biology*'. It was intended for the specialist in biology, biochemistry and biophysics to provide information on photoreactions in biology. The book was published in 1965 and later on translated in German. It has functioned as an advanced textbook for many students in those days.

Jan Barth was not only a creative scientist, but he also enjoyed making movies and taking photographs. In the laboratory he played a very amusing role in 1949 making a full cabaret of about an hour (all in rhyme) as a traditional *Sint Nicolaas* in the laboratory of Physics. He elicited a lot of laughs and happy faces. In 1956, he was asked to make a movie in honour of the 250th anniversary of Experimental Physics in Utrecht. He made the movie and it was a very successful

one: Science, history and fairy tale mixed in a fascinating story playing in 1100. The movie is still kept in the historical archives of the University.

All the people who worked with him were impressed by his charm, his modesty, his courtesy to everyone and his kindness. Jan Barth also took his duties outside the laboratory very seriously. For a long period he was active as an elder in the Lutheran Church and he was one of the governors of a home for elderly people.

In 1970, one of us (Gijs van Ginkel) joined the Department of Biophysics as Jan Barth's last Ph.D. student. When Gijs had just arrived and was sitting in his little working room (a desk and two chairs) Jan Barth knocked on his door and entered the room, his eternal cigar in the left hand. He welcomed the new Ph.D. student and told him that it was a custom at the Biophysical Department to call each other by their first names. He told that he would appreciate to continue that custom and said: My name is Jan Barth but friends call me Tom. You can make your own choice. For Gijs it was Tom ever since. In 1977 Tom resigned as a Professor and many outstanding scientists signed the 'friends-book' made in honour of Tom.

When looking back upon Jan Barth's scientific career we can roughly divide it into two periods: (1) the period from 1932–1948, and (2) 1948–1977.

In the first period, Jan Barth covered a broad field of research. This is fairly easy to trace, since all the papers Jan Barth has published are saved in the archives of the Department of Molecular Biophysics in Utrecht. His broad field of interest in biology is illustrated by the many different subjects he studied: The respiration mechanism in the earth worm; the determination of the optimal growth conditions of the fungus *Actinomyces maculatus*; electrical phenomena in plants in relation to different physiological processes; the waterhousehold in different tropical plants and seeds; plant hormones and their effects on growth, flowering, etc.; and the development of differences in form between the left and the right hand under conditions of hard labour. This last study was, according to the paper, started in the Japanese prisoner of war camp in Tjimahi (Indonesia).

In the second period, from 1948–1977, Jan Barth's work at the Biophysical Research Group in Utrecht directed his interest to the role of the different pigments in the process of photosynthesis and in the structure of the photosynthetic apparatus. This shows, for example, through a series of papers in *Biochimica et Biophysica Acta* (1950, 1953) on the role of carotenoids and other accessory pigments in the photosynthesis of higher plants and photosynthetic bacteria in which he showed, e.g., that in photosynthetic bacteria phototaxis and photosynthesis are related processes.

In the beginning of the 1950s the electron microscope became available for practical use and Jan Barth was very much aware of the potential of this instrument for structural studies of the photosynthetic apparatus. Jan Barth was, therefore, one of the driving forces in establishing an electron microscope center for structural studies in biology. He published a series of pioneering papers on the structure of the chloroplast. These papers can be found mainly in *Biochimica Biophysica Acta* (1952–1954) and in a number of review papers from his hand, e.g., in *Progress in Biophysics and Biophysical Chemistry* (1955), *Endeavour* (1958) and *Encyclopedia of Plant Physiology* (1960).

In 1959–1960, during his visiting professorship at the Photosynthesis Research Laboratory of the University of Illinois, Urbana, a series of papers were published in *Science*, *Biophysical Journal* and '*Light and Life*' on the Emerson enhancement effect in the Hill reaction of *Chlorella*, on the changes in quantum yield of photosynthesis in the red alga *Porphyridium cruentum*, and on the inhibition of photosynthesis in certain algae by extreme red light. The latter phenomenon still awaits further investigation. These papers were published in cooperation with Eugene Rabinowitch, Rajni Govindjee, and Govindjee, all well-known in the field of photosynthesis research.

Back in Utrecht, The Netherlands, Jan Barth started his investigations on the fractionation of chloroplasts with detergents and other procedures to unravel the supramolecular structure of the chloroplast membranes. At the same time, he started investigating the absorption spectra of photosynthetic pigments in solution, in mem-

brane fragments, in chlorophyll-protein complexes and in vivo to find out what factors determine the complicated in vivo spectra of the chlorophylls in relation to their function in the photosynthesis process. This work has been published in many papers in several different journals (e.g., *Biochimica et Biophysica Acta* 1954, 1957, 1959, 1963, 1967). These structural and spectroscopic studies gave a much better insight in the location of the different photosynthetic pigments in the cells and in chloroplasts.

In the period 1965–1977, Jan Barth started an elaborate study on the different chlorophyll complexes and chlorophyll forms found in vivo and on fractionation in vitro. He published his results, e.g., in *Biochemistry of Chloroplasts* (1966) and in *Biochimica Biophysica Acta* (1962, 1963, 1964, 1965, 1968, 1970–1977). His investigations showed that chlorophyll *a* and *b* in vivo have different spectral forms as judged by the red absorption band of these chlorophylls. In 1967 he published experimental data on linear dichroism measurements on oriented spinach chloroplasts from which he constructed an orientational model of the different chlorophyll forms in the photosynthetic membranes (*Biochimica et Biophysica Acta*).

In 1972, Jan Barth was invited to give a series of lectures at the NATO Advanced Study Institute in Badia Fiesolana, Italy, on Primary Molecular Events in Photobiology. His lectures on the physico-chemistry of photopigments and on light-absorption, energy transfer and photosynthetic units were published in the proceedings in 1973. Jan Barth continued his studies on the spectroscopy of the photosynthetic pigments until his retirement in 1977. His studies have contributed to obtain a better insight into the function of the different chlorophyll forms in the different photosystems and in the different photosynthetic reactions.

His experiences with research had made Jan Barth very much aware of the importance of scientific communication for the progress of science. He also wanted to create opportunities for young research students to meet and interact with experienced researchers. He therefore started the Dutch photosynthesis meetings, which originally took place twice a year. Since these meetings proved to be very attractive for

people from abroad (Belgium, France and Germany) they asked to attend the Dutch meetings. This led Jan Barth to the proposal of organizing regular West-European photosynthesis conferences as an addition to the already existing Russian and American conferences. The importance of this proposal was generally acknowledged and this led to the first meeting in July 1962 in Gif-sur-Yvette (France). The proceedings of this conference are published under the title 'La photosynthèse', edition no. 119 from the CNRS. In September 1965, Jan Barth and Joop Goedheer organized the second Western-European conference on photosynthesis in Woudschoten (Zeist), The Netherlands. The proceedings of this conference had the well-chosen title 'Currents in photosynthesis'. Already at that time the conference attracted people from all over the world. For that reason, these conferences rapidly extended to become international conferences that included scientists from all over the world. Although Jan Barth was far too modest to pay attention to that type of compliment, it is fair to state that he really was the father of the now well-known international conferences on photosynthesis which are organized every three years. The IXth International conference is to be

held in the fall of 1992 in Japan. Next to his scientific work on the structure and spectroscopy of the photosynthetic apparatus, the idea of international conferences on photosynthesis is Jan Barth's other great gift to the photosynthesis community. His initiative is gratefully acknowledged. As head of the Biophysical Research Group at Utrecht, Jan Barth also acknowledged the importance of international cooperation. He therefore realized as much as possible, exchanges with scientists from all over the world. The guest book of the Biophysical Research Group contains, for that reason, many well-known names in the field of photosynthesis research who all stayed for a shorter or longer period of time in Utrecht, e.g., Daniel Arnon, Robert Emerson, Robert Hill, Eugene Rabinowitch, Stacey French, Francis Haxo, Melvin Calvin, John Olson, Per Halldall, Martin Kamen, Roderick Clayton, Dave Fork, Jeanette S. Brown, Govindjee, Gunnar Öquist, V.B. Evstigneev, B.A. Gulyaev and many others.

With the death of Jan Barth Thomas all of us have lost a very capable and open-minded scientist and a lovable and caring person. That picture will stay in our memory.

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