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*Obituary*

# Tribute: in memory of Professor Dr. Dr. h.c. André Pirson, a pioneer in photosynthesis and a dedicated academic teacher

**André Pirson (1910–2004)**

André Pirson was born March 26, 1910, in the university town of Erlangen, Germany. Although his father was a professor of Romance languages, André's interest was focussed on the diversity of flora and fauna of the area. In high school he obtained a classical education and he graduated at the age of 17.

Most important for Pirson's career was his acquaintance with Professor Kurt Noack (1888–1963), the director of the Botanical Institute in Erlangen. When Pirson approached Noack with his wish to study biology, Noack urged him to first study chemistry as an important basis for the understanding of biology. Pirson accepted this suggestion.

Meanwhile Noack became director of the Botanical Institute of the University of Berlin in Berlin–Dahlem. Pirson follwed him to Berlin after eight semesters of chemistry in Erlangen. At that time Noack was the leading expert in photosynthesis among German botanists. Noack admired Justus von Liebig (1803–1873) and his idea to combine chemistry and agricultural research, particularly the effect of ions on the growth of agricultural plants. Thus, it was not surprising that Noack suggested to Pirson to study the role of inorganic ions on plant metabolism. Beginning with the water moss *Fontinalis* as research subject, Pirson decided to use green microalgae in his studies. These organisms remained the main subject of research during his scientific career.

In order to learn manometric techniques Pirson was sent by Noack to Otto Warburg (1883–1970, Nobel Prize 1931), the director of the neighbouring Kaiser-Wilhelm-Institute. Pirson was impressed by Warburg's experimental skills, but did not appreciate the authoritarian way in which Warburg ruled his institute. Pirson discussed the optimum growth of *Chlorella* with Warburg several times. Warburg's method of growing the algae in 'Brunnenwasser' (well water) at a north window was challenged by the method of supplying artificial medium and illumination, to which Warburg finally agreed. The use of 'Brunnenwasser' for

growth was one of the arguments that Warburg later used in the severe dispute about quantum yield of oxygen evolution between him and his own student Robert Emerson in the USA.

In Warburg's Institute, Pirson met Hans Gaffron (1902–1979), who had just opened the exciting field of hydrogen metabolism in unicellular green algae (see Homann 2003). With him, Pirson shared a life-long friendship and a frequent scientific exchange.

With a thesis on 'Nutritional and Metabolic Investigations with *Fontinalis* and *Chlorella*', Pirson obtained his PhD degree in 1936 (Pirson 1937). His thesis included the discovery that manganese is essential for photosynthesis. Although he calls it only 'byproduct of his interest in biology of green unicellular microalgae' (Pirson 1994), it has reserved him a place in the hall of fame of photosynthesis. Only a few happy years of undisturbed scientific research in Berlin followed until he was drafted into the army at the beginning of World War II.

In 1943, Pirson was granted a three-day leave of absence for his 'habilitation'. Among his examiners was Professor Adolf Butenandt (1903–1995, Nobel Prize 1939). A year later Pirson, still in the army, was appointed Associate Professor ('außerordentlicher Professor') for Botany in Marburg (October 1944). At the end of World War II he was interned as prisoner of war. After six years of service and internment, Pirson returned to Marburg where he was immediately appointed Director of the Botanical Institute.

What did the young Professor expect in Marburg? The greenhouses were damaged by air raids, the rare books hidden in a salt mine and the valuable instruments, stored away in the castle of Marburg, were lost. The botanical garden was used for growing vegetables. There was not enough coal to heat the lecture hall and the provisionally repaired greenhouse. Hence, the rest of the unique plants were lost due to frost. In spite of these circumstances the Philipps-University of Marburg reopened for the winter term of 1946–1947. Pirson's lectures had to cover the whole spectrum of botany for biology students and specific topics for medical and pharmaceutical students. He fully dedicated himself to meet these demands.

Pirson started his most popular lectures at 7 A.M. in summer and 8 A.M. in winter. Students waited in line in front of the institute 20 minutes before the start of the lecture in order to catch a seat in the overcrowded lecture hall.

In 1958, Pirson succeeded Richard Harder as director of the Institute of Plant Physiology at Göttingen. It was quite a change moving from the cramped facilities in Marburg to a brand-new building in Göttingen. Pirson soon expanded the scientific spectrum of his institute by establishing a Department of Plant Biochemistry. Its chair was

*Figure 1.* A. Pirson (sitting on a chair), E.G. Pringsheim (standing in front of the table) and R. Harder (standing) at the celebration of Pringsheim's 80th birthday in 1961.

first held by Günther Jacobi, then Achim Trebst and later Hans Held.

Also very stimulating was the presence of Professor E. G. Pringsheim (1881–1970), with his famous collection of algae. Pringsheim had been invited by Richard Harder and had received an honorary position as professor emeritus at the University of Göttingen (Figure 1). In the context of the continuation of Pringsheim's algae collection, Pirson took care of the establishment of a 'Department of Experimental Phycology' under the guidance of Wolfgang Wiessner.

Pirson was a most dedicated teacher. He placed the highest demands on himself and his students. His lectures were well-prepared and supported by experimental demonstrations, by exhibitions of plants and by microscopical preparations as well as by large charts. Pirson's standard was Professor Noack's lecturing. Pirson said about Noack's lectures that they 'were feared by beginners, but held in great esteem by advanced students'. The same was true for Pirson's lectures. His assistants in Marburg and Göttingen had no easy time, since they would often hear: 'This has much better worked out in Berlin'. An advantage that Pirson had as a lecturer was his phenomenal memory, which always kept him up-to-date with the scientific literature.

Pirson was a scientist with excellent theoretical knowledge. He inspired his group with new ideas and had a deep interest in what was going on. Students had to regularly report to him about the progress of their experiments.

The topics that Pirson was pursuing with his group were manifold (for details, see Pirson 1994).

*Figure 2.* Pirson in a typical position taking pictures of flowers during a field trip.

It was important to him that all research was seen in the context of the biology of the whole organism in order to understand the complexity of life. Isolated biochemical pathways were not the topics of choice. The influence of ions on the metabolism, especially photosynthesis, remained one of the major topics. After Hiroshi Tamiya (1903–1992) published his first paper on synchronization of Chlorella (Nihei et al. 1954), Pirson's students brought this method to perfection. They used it to study the mechanism of synchrony and metabolic changes during the life cycle of unicellular green algae. The question of the nature of the photoreceptor for the light-dependent induction of cell division resulted in experiments with monochromatic light. The research in this area was soon extended to investigations of wavelength-dependent influence of light on metabolism of plants in general. This is a topic still successfully worked on by Pirson's students and researchers all over the world. Apart from a predominant interest in the metabolism of micro algae, there were remarkable contributions by Pirson and co-workers in the field of expression of photosynthesis-related enzymes in rye seedlings (Feierabend and Pirson 1966).

Pirson trained more than 50 doctoral students and 18 of them obtained professorships. He considered the writing of reviews and transfer of knowledge of plant physiology, especially photosynthesis, to scientists in 'neighbouring' fields and to students to be academic obligations. It came as no surprise that he was asked to cover the field of photosynthesis in the 'Handbuch der Pflanzenphysiologie' (Pirson 1960), and that he was later assigned the job of editor-in-chief for the second edition of the now-named 'Encyclopedia of Plant Physiology' (Pirson and Zimmermann 1977, 1979, 1986).

All of Pirson's students experienced the accuracy and persistence with which he worked on a thesis or publication. He carefully discussed each thesis page by page and it could take a long time for a thesis to be acceptable to him or a manuscript ready for submission to a journal. And after a long day of intensive work, Pirson liked to play his violin late in to the night.

Outstanding events were the 'great excursions' under Pirson's guidance to 'foreign' countries. It was a great honor for him to be asked to participate. Good physical condition and a solid knowledge of plants were helpful. The chosen

route always included a cultural highlight, whether it were the prehistoric paintings in the cave of Lascaux, the monastery of St. Martin du Canigou during a Pyrenee excursion or the Nidaros Dome during a Lappland excursion. André Pirson was passionate about romanesque art and an expert on romanesque architecture. Another hobby was plant photography. We all remember his position when taking close-ups with a telephoto lens (Figure 2). The good spirit experienced during the excursions resulted in a climate of co-operation and friendship in the institute.

The honors that André Pirson received were many. For a decade, he was President of the German Botanical Society. He was elected member of the 'Akademie der Wissenschaften' in Göttingen and the 'Deutsche Akademie der Naturforscher Leopoldina' in Halle. The 'Department of Biology at the Philipps University' of Marburg honored his specific merits for the reinstallation of the 'Institute of Botany and Pharmacognosy' in Marburg after 1946 and his fundamental contributions to photosynthesis research, mineral nutrition of plants and biology of important algal taxa, as well as his efforts to restore the international reputation of science in Germany after World War II with an honorary PhD.

André Pirson died on February 7, 2004. He will be remembered as an outstanding scientist, dedicated academic teacher and supporter of a rising scientific generation. His students and colleagues will miss him and keep his memory alive.

**Acknowledgements**

Since 1952 I had the privilege to know Prof. Pirson and to work on my PhD thesis (Senger 1961) under his guidance. We published only one short paper together (Pirson and Senger 1961), but a mutual interest in science and romanesque art resulted in a close contact and regular exchange of letters. I thank Govindjee for the invitation to write this tribute and for editing it.

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