



PROF. M.G.J. MINNAERT
(1893–1970)

IN MEMORIAM

MARCEL GILLES JOSEF MINNAERT

(12 February 1893–26 October 1970)

Marcel Gilles Josef Minnaert was born in Brugge (Flanders, Belgium) on February 12, 1893. He died in Utrecht, The Netherlands, in the early morning of October 26, 1970. His life was dedicated to science, and was a continuous struggle for justice to the poor and the persecuted, against human discrimination and for a better society.

Minnaert was from a family of liberal bourgeois, intellectually heirs of the spirit of the French Encyclopedists and of the 'Enlightenment'. Both his father and mother were teachers, and there were many more members of his family with teaching functions. In his youth, he was influenced by his uncle Gerard Désiré Minnaert, who was important in the Flemish movement. Minnaert grew up in a part of a country where the official language, taught at the schools, was French – in contrast to the people, speaking the Dutch language. At school, he was confronted with the handicap such a situation offers to the average pupil; and in the society of those days he observed the injustice of the semi-colonial situation existing in his part of Belgium. He gradually realized that the so-called linguistic problem was, in fact, a social problem and that the goal of obtaining equal linguistic rights for the two parts of Belgium would go together with obtaining the same social status for the two people of the country.

After his father's death in 1902 his mother and he moved to Gent, where Minnaert later started studying biology at the University. In 1914 he defended a thesis on the subject 'Contribution à la Photobiologie Quantitative'. Like all his examinations also his thesis was passed with the 'highest distinction'. In order to improve his knowledge of physics, considered necessary for further progress in photobiology, and also because the young Flemish University was in great need for someone who could teach physics in the Dutch language, he went in 1915 to Leiden, which at that time – with Lorentz, Ehrenfest, Kamerlingh Onnes – was one of the centers of advanced physics in the world.

In the meantime, the first World War had come over Europe, and the larger part of Belgium was occupied by the German army. At that time the University of Gent was changed to become a completely Flemish University, a long-desired goal of the Flemish intellectuals, and in 1916 Minnaert was nominated lecturer in physics there. He taught physics in Gent during 2 years; but towards the end of the war it became clear that those who had contributed to the linguistic reorganisation of the University of Gent would be considered collaborators by the Belgian government. In order to avoid arrest, many of the leading Flemish Belgians left their country for the Netherlands towards the end of the first World War. Minnaert (who would later be condemned to 15 years penal servitude) went to Utrecht, where at the Physics Laboratory

the new technique of quantitative spectrophotometry was under development. The Director Julius suggested him to apply the new art to the solar spectrum by means of the newly built solar tower spectrograph – at that time the third in the world. In November 1918 he started his work in solar spectroscopy. In 1919 he was nominated an observer at the University; in 1925 he defended – cum laude – a thesis on ‘Anormal Dispersion’. That year, Julius died and Minnaert was charged with the further development of solar physics in Utrecht. Gradually, an extremely fascinating time started. The development of atomic physics enabled one to understand solar physics better. In 1928 a highly successful eclipse expedition led to the first quantitative photometry of the flash spectrum (with A. Pannekoek). Around 1930 the concepts ‘equivalent width’ and ‘curve of growth’ were developed. Then came, partly parallel with similar work by Unsöld in Kiel, the theory for the quantitative interpretation of profiles of Fraunhofer lines, the interpretation of the spectra of sunspots, the quantitative calibration of the Rowland Tables, the theory of weak lines, culminating at the end of the thirties in the Utrecht Photometric Atlas of the Solar Spectrum. The Atlas could be finished just in the beginning of the war period. Five copies could leave Europe with the last plane for the United States. In the meantime Minnaert was nominated professor and director of the Utrecht Astronomical Observatory in 1937. The solar spectrograph was moved from the Physics Laboratory to the Observatory, situated at the bulwark ‘Sonnenborgh’ (Castle of the Sun; the name dates from 1542, a fine name for an astronomical observatory that would be devoted mainly to solar physics). However, further work was greatly hampered by the second World War, which was detrimental for science in Europe. Minnaert, who never concealed his anti-fascist attitude, was taken as a hostage in May 1942 and remained in prison till April 1944.

After the war scientific work started again and developed gradually. Minnaert finished his work on the weighting functions in the solar photosphere; but gradually moved his interests to other fields than solar physics. A fine review of his period as a solar spectroscopist is given in his review paper ‘40 years of Solar Spectroscopy’, given at the occasion of his retirement as Director of the Utrecht Observatory in 1963 and published in the proceedings of the Symposium on ‘The Solar Spectrum’ held at that occasion.

His later work after the war dealt partly with problems of lunar photometry; he also finished some investigations on the heating of the comets, the Orion nebula. He wrote review papers on the solar photosphere and on lunar photometry in Kuiper’s series of books on the Planetary System.

Minnaert had also very great interests in subjects outside astronomy. He wrote a book in Dutch: *Sterrekunde en de Mensheid* (Astronomy and Mankind), another in Dutch on *Poets on Stars*, being a wonderful collection of poems from many languages on astronomical subjects. Very famous is his series *Physics of the Open Field* in three volumes, translated in many languages. During many years he was an active member of a commission for the publication of the collected works of Simon Stevin, a great natural scientist of the 16th and early 17th century, born in Brugge, like himself.

Minnaert had also great interests in the teaching of astronomy. In 1930 he became private lecturer at the Utrecht University on the subject 'The teaching of Physics'. He was at that time one of the first two teachers on such a subject in The Netherlands. Immediately after his nomination as Professor of Astronomy in 1937 he started a series of practical exercises in elementary astronomy which had to be made by all students in physics, mathematics and astronomy in their first two years during one evening per week. The outline of these exercises was published in 1969 in his book *Practical Work in Elementary Astronomy*. Minnaert was, furthermore, involved in the establishment of Commission 46 of the International Astronomical Union on the 'Teaching of Astronomy'. In the International Astronomical Union Minnaert had been president of Commission 12 (Solar Radiation); from 1955 through 1961 he was president of Subcommission 14a (Table d'Intensités). From 1948 through 1952 he was president of Subcommission 36b (later Commission 36) on the theory of Stellar Atmospheres. He was president of Commission 38 on the Exchange of Astronomers from 1961 through 1970, president of Commission 46 on the Teaching of Astronomy from 1964 through 1967 and in 1970 at the Brighton General Assembly of the International Astronomical Union, while already very ill, he was nominated president of Commission 17 on the Moon.

His international prestige may also be apparent from the fact that Minnaert's help was asked when in 1952 Bernard Lyot died after having participated in an Egyptian eclipse expedition. At some time after his death certain difficulties arose between French and Egyptian astronomers about the owners rights of the fine coronal spectra obtained at that occasion. That this problem could have been solved to the satisfaction of all involved was for a great deal due to Minnaert's intervention.

Minnaert was member of the Academies of Sciences of Amsterdam, Brussels (Flemish), Boston, Washington, Halle and Rome. He was member of the Royal Astronomical Society, London; of the Kungl. Vetenskapsamhället at Uppsala, and of the Istituto at Coimbra. He obtained the Gold Medals of the Royal Astronomical Society in 1947 and of the Astronomical Society of the Pacific (the Bruce medal) in 1951. He was honorary doctor at the Universities of Heidelberg, Moscow and Nice. He was married with M. B. Coelingh. They had two sons, of which the eldest died in 1963.

With Minnaert's death astronomy lost one of its most devoted students, the world a honest and truthful man, a charming and humanly highly sympathetic personality. All over the world his friends and colleagues mourn his death. May his example guide us in our future work and life!

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