

Paul Fröhlich †

He was born on December 6, 1889. He went to the Protestant Gymnasium in Budapest and then studied mathematics and physics at the Philosophical Faculty of the University of Budapest. He graduated in 1912. Previously he had already been invited by Loránd Eötvös to the Geophysical Institute and after taking his degree he spent all the time he could spare working there. He took part in two geophysical expeditions, one of them was carrying out the determination of g on the ice of Lake Balaton and the other in Transylvania. The first world war interrupted his scientific career he served in the army from October 17, 1913-December, 1917. He was seriously wounded during the fighting on the Serbian battlefield. He obtained a degree as Ph. D. from physics in June 15, 1918. and received on October 1, 1923. the title of „Lecturer“ of the Philosophical faculty of the University of Budapest on the base of his study on „Experimental and Theoretical Optics.“ During the time of his military service he even spent the short periods he was on leave at the Loránd Eötvös Geophysical Institute also dealing with optical problems besides gravitational investigations.

On October 1924. he became Professor of Experimental Physics of the University of Szeged.

In the meantime he had been granted a scholarship by the International Board of Education and went to the United States to continue his research work. He studied at the John Hopkins University at Baltimore and at the Physical Institute at the University of Chicago. In Baltimore he worked in the laboratory of Prof. R. W. Wood, in Chicago in those of Professors Millikan, Michelson and Compton. In 1928 he was delegated by the Hungarian State to continue his scientific research work at the Universities of Berlin, Jena, Göttingen, Heidelberg and Munich and in the same year the Hungarian Academy of Science elected him as a member. In 1930 the Institute of Experimental Physics of the University of Szeged was built and equipped according to his plans.

Initially he investigated classical optics, but during the period of his American scholarship he began to study questions concerning colloid phosphors. A token of the acknowledgement of his research work abroad was an appeal from Wo. Ostwald the Editor of the „Kolloid Zeitschrift“ and one of the most prominent workers in this field inviting him to become a collaborator of the aforementioned periodical. His communications were also published in *Annalen der Physik*, *Zeitschrift für Physik*, *Mathematikai és Természettudományi Értesítő* and *Math. és Fizikai Lapok*.

As a man his dominating characteristic was his modesty, which reached such an extent that it even extended to his scientific work. Fame and glory were quite unimportant to him he worked for the sake of working not for personal ambitions, that is why he did not either stress the importance of his results.

As a research worker his work was characterized by great accuracy and precision. Before the publication of any paper he always carried out most precise control experiments and his collaborators had also to conform to this rule. He was a true physicist

who above all believed in experimental facts and was very careful concerning the explanations deduced from the experimental facts. He interpreted the experimental facts as simply as possible and advised his co-workers to act in a similar manner. In the case of a collaborator reporting on some partial result in the course of the experiments, he listened to him readily and even talked the matter over with him in detail, but if by any chance something diverging from the simple experimental facts was mentioned for instance: I believe this phenomenon will result in, then the answer was always: „it must be examined.“

A significant part of his work was devoted to education. His lectures were exemplary, lucid and very comprehensible. He also directed his attention towards eliminating the dryness and monotony of the lectures by illustrating them with observations and anecdotes. He educated a whole generation who were all very attached to him and deeply moved by the event of his death.

His deeply human feelings and trend of thought was shown by the fact that he provided with equal kindness for all the members of his institute. He considered everybody to be his friend and as such tried to support them in every possible manner.

He died on October 15, 1949 quite suddenly under tragic circumstances. Unfortunately we could no more celebrate his 25 years jubilee as a Professor. Even during his brief illness — when he felt a little better — he sent for his co-workers and attempted till the very last to support them with his advice.

His death is an irreparable loss to his friends, co-workers, pupils and the University of Szeged.

The Scientific Research Work of P. Fröhlich

He began his scientific investigations with examinations concerning the field of classical optics. His earliest investigations were concerned with the examination of the polarization of the refracted ray in the vicinity of the critical angle of total reflection (1, 2). He examined the polarization state of refracted light rays at the critical angle of the total reflection. If the incident light ray is perpendicularly polarized to the plane of the incidence, i.e. the vector lies in the plane of the incidence, then a linear vector penetrates into the second medium which changes towards the direction of the normal of the separating plane.

The examinations strictly proved the theoretically established behaviour concerning the polarization of the refracted light ray.

He dealt in several papers in detail with one of the most important laws of classical optics with the limit of the validity of the geometrical law of reflection (3—7). In classical optics it has been theoretically established that the light vector penetrates also in the case of total reflection into the second medium. With the depth of the penetration the amplitude of the vector diminishes. Thus complete refraction can only occur if the thickness of the less dense medium is greater than the depth of the penetration of the vector. The ex-