

he designed many other notable systems, including a range of apochromatic objectives. During the War of 1914-18 it was early found that all the periscopes used in British submarines had been obtained from a foreign firm and that no British maker had experience of their design and manufacture; but Conrady produced very successful designs for this essential instrument and superintended the subsequent production, thus helping materially to avoid a very grave peril.

The Department of Technical Optics was founded at the Imperial College of Science and Technology in 1917 to meet the urgent need of training more optical designers for British firms, and Conrady was appointed to the chair of optical design on the strong recommendation of the late Prof. F. J. Cheshire. Conrady's first class was a summer vacation course, attended by a large number of enthusiastic students including a Senior Wrangler. Freed from the immediate pressure of an industrial post, Conrady's unrivalled practical experience flowered into original and strikingly simple treatments of optical theory.

Conrady had already had contributions to the theory of optical design published in papers in the *Monthly Notices of the Royal Astronomical Society* during 1904-5, and had thus indicated already that the main feature of his work would be the application of physical optical principles in this field. He was greatly influenced by the work of the late Lord Rayleigh, and coined the now familiar term 'Rayleigh limit' to denote the  $\lambda/4$  maximum allowable optical path difference characteristic of a good design. He worked out the relations between geometrical and physical expressions of aberration, and showed how to control the residual aberrations. A series of papers which appeared in the *Monthly Notices* during 1918-20 reflect something of the fertility of his ideas, which were, however, treated much more fully in the typed lecture notes issued to students. His well-known book, "Applied Optics and Optical Design" (Oxford University Press, 1929), was the result of many trials and experiments in presentation. His work has placed the whole subject of optical design on a far stronger basis than was previously obtainable.

Beyond the material contained in the first book, he had given, in his lectures to advanced students, more extensive material on the systematic design of microscope objectives and a new treatment of aberration theory based on considerations of optical path. It was hoped that after his retirement from the Imperial College in 1931, he would have leisure to complete this material for a second volume, but ill-health unfortunately frustrated him. The hope has been widely expressed that since some members of his family are distinguished in the fields of physics and optical design, they will be able to edit and publish the very full notes which he left.

Conrady was never happier than when lecturing to his students, emphasizing special points with a shake of the upraised forefinger. He had a keen sense of fun and humour, and he enjoyed and told many a good story. Fond of the open air, his favourite holiday frequently took the form of an extended trip with his family up the Thames in a rowing boat. He was, however, extremely shy and sensitive, shrinking instinctively from controversy.

His activity of mind made him seem somewhat inattentive to parallel work carried out by others. Faced by a question, he found it easier to obtain the answer from his own research than by reference to

published literature, and indeed his writings are remarkable for their scarcity of references to investigations published by other writers. He might have been happier if his temperament had allowed him more readily to tolerate controversy and criticism, but on his retirement he withdrew completely into privacy, partly owing to indifferent health. He had lectured before the Royal Institution, and had received the Traill-Taylor Medal of the Royal Photographic Society; and it is pleasant to record that shortly before his death he was made an emeritus professor of the Imperial College of Science and Technology. But if honours were comparatively few, his most notable honour is the gratitude of many students to whom he opened paths which would otherwise have been impassable. His passing will be much to the regret of students and former colleagues.

In 1901 he married Annie, the fourth daughter of William and Mary Bunney of Harefield, who died in 1941. He is survived by three daughters.

L. C. MARTIN.

#### Dr. Milan Hodža

DR. MILAN HODŽA, the Czechoslovak scholar and former statesman, died in Florida on June 27 at the age of sixty-six. The son of a Protestant pastor, Hodža was born at Sučany, in north Slovakia, in 1878 and graduated at Budapest. Circumstances led him to champion the cause of his Slovak kinsmen, whom he represented in the Hungarian parliament during 1905-14. He was imprisoned during the War of 1914-18, but when the Czechoslovak Republic was founded his advancement was rapid. Indeed, he was almost continuously in the Cabinet either as Minister of Agriculture or Education and lastly as Premier during 1935-38.

Hodža was responsible for many progressive educational measures and for various social advances such as the radical land reform in Czechoslovakia. In education, his policy was to neglect no section of the community, and to utilize the nation's resources to the financial limit. This involved the erection, equipping and staffing of thousands of new elementary and secondary schools, and the establishment of two new universities, besides various scientific institutes and research stations. In agriculture he realized the importance of the need for greater application of scientific knowledge for improved crop cultivation and stock-breeding, and he also did much to promote international co-operation among agriculturists.

His premiership coincided with critical years for his country, and when its independence was lost he went first to France, then to England and finally to the United States, where his last years were spent in writing his "Federation in Central Europe", in which he outlined a scheme for a federal co-operation among the Danubian States.

G. DRUCE.

WE regret to announce the following deaths:

Sir Ralph Fowler, O.B.E., F.R.S., Plummer professor of applied mathematics in the University of Cambridge, on July 30, aged fifty-five.

Mr. F. J. Mortimer, C.B.E., a former president of the Royal Photographic Society and editor of several photographic journals, recently by enemy action, aged sixty-eight.