parallaxes from double stars for which the relative motion is known. Again, although the linear speed differs considerably from one star to another, the proper motions of stars can be considered as an index to the distance—a much better index than the apparent brightness.

In these and other indirect ways our knowledge of stellar distances is being rapidly advanced. It must be remembered that it is all ultimately based on measured or trigonometric parallaxes. The larger trigonometric parallaxes can be applied directly to the individual stars concerned, but for the smaller parallaxes the discussions must be of a statistical nature, as the errors of observation are too great. The indirect methods can, however, be pushed to stars at very great distances if only they appear bright enough for the necessary observations to be made.

Obituary.

JOHN ROBERT PANNELL.

JOHN ROBERT PANNELL, who was killed in the disaster to the airship R38 while making observations on behalf of the National Physical Laboratory, was the only surviving child of Mr. and Mrs. Pannell, of Nutley. He was born in 1885. A delicate childhood, which none would have suspected from his adult physique, interfered greatly with his education, but after courses at the Northampton Institute and some engineering works experience he joined the National Physical Laboratory in 1906 as a student assistant.

His best-known work is that carried out in conjunction with Mr. Stanton on dynamical similarity in the flow of liquids in pipes, which has become classical as the most complete demonstration of that principle in its important applications to hydrodynamics. With Mr. Stanton he also investigated with great elaboration the strength of welded joints; but most of his work is to be found in reports to the Advisory Committee for Aeronautics covering almost the whole range of experimental inquiry in aerodynamics. When problems of airship construction became prominent in 1916 he took part in most of the model measurements on resistance and the efficiency of controls; and when, again, after the war, it became possible to compare the results of model and full-scale tests, Pannell took charge of the latter and was constantly making observations on airships in flight.

In a science so little amenable to general theory the ability to make long and tedious series of routine measurements without allowing familiarity to breed carelessness is of special importance. This ability Pannell possessed in the highest degree. He had that genial serenity and evenness of temper often associated with one of his gigantic stature; neither the perversity of apparatus nor the impatience of petulant colleagues could make him relax for a moment the precautions that are the first necessity of such work. If the human tragedy of the R38 is partially compensated by a gain to science, that gain will be largely due to merits in Pannell's work which are too often eclipsed by more brilliant but not more useful achievements.

In private life the most lovable of men, he radiated kindness and good temper. He was of tireless physical energy, and his war-time leisure, devoted to a small farm, shamed the full-time occupation of many men. He leaves a widow, the true partner of all his labours, with whom all will feel sympathy in the exact measure of their acquaintance. N. R. C.

WE learn, with regret, of the death on September 10, from drowning near Ottawa, of Mr. F. W. L. SLADEN, author of "The Humble-bee: Its Life-history and How to Domesticate It." Mr. Sladen was forty-five years of age.

THE death of Mr. JOHN PEARCE ROE took place on September 2. Mr. Roe was born in 1852, and was the chairman and managing director of Ropeways, Ltd., of London. He carried out a large amount of work in connection with the transporting of materials by means of aerial ropeways.

Notes.

THE *Chemical Age* announces that Sir William Pope has been elected an honorary fellow of the Canadian Institute of Chemistry.

IT is announced that the annual meeting for 1922 of the British Medical Association will be held at Glasgow on July 21–29. The authorities of Glasgow University have given the association permission to use the University buildings, and offers of assistance should be addressed to Dr. G. A. Allen and Dr. J. Russel at the University.

WE learn from the *Lancet* of September 17 that the Health Committee of the League of Nations is constituted as follows:—Dr. Léon Bernard, professor of hygiene in the University of Paris; Dr. G. S. Buchanan, senior medical officer of the British Ministry of Health; Prof. A. Calmette, director of the Pasteur Institute in Paris; Dr. Carozzi, medical director of the International Labour Bureau; Dr. Henri Carrière, director-general of the Swiss Public Health Service; Sir Havelock Charles, president of the Medical Board for India; Dr. Chodzko, Minister of Health for Poland; Dr. Lutrario, director-general of the Italian Public Health Service; Dr. Th. Madsen, director of the State Institute of Serotherapy at Copenhagen; Prof. Miyajima, of the Kitasato Institute for Infectious Diseases, Tokyo; Dr. Pulido, president of the Spanish Royal Council of Public Health;