chair of engineering at Yorkshire College, Dr. William Stroud went to the college as professor of physics. These two young men became close friends, and the partnership proved most fruitful of results. Prof. Barr brought to it his gifts of mechanical invention and organising ability; Prof. Stroud, his flashlight penetration to the scientific core of a problem. In 1888 they decided to carry out a research on the mechanical equivalent of heat, but immediately thereafter they chanced upon an advertisement by the British War Office calling for a range-finder to measure ranges for gunfire, and in three weeks' time the essential features of the modern instrument had taken experimental form. For some years they worked at the development of the instrument, Prof. Barr making many of the parts with his own hands, and himself adjusting them from a platform on the roof of his house in Glasgow. In 1892 the first naval range-finder was built and tried on board H.M.S. *Arethusa*, and at once demonstrated its value to the Service; from that time the demand for such instruments steadily increased. In 1895 a small workshop was opened in an old stable, and later, another old building was occupied in the same neighbourhood. In 1904 the first part of the present factory building of Barr and Stroud, Ltd., was opened at Anniesland, on the western outskirts of Glasgow, with about a hundred workmen. It grew by 1914 to a factory with 900 men, supplying naval and military instruments to the British Government and nearly every foreign Power; while during the War, the main building was extended and two new buildings added to provide room for more than 2000 workers.

Prof. Barr took the keenest interest in all the problems of manufacture and factory development, visiting the United States in 1896 to learn something of their machine methods, and installing the first American milling machine to come to Scotland, two years later. He initiated the scheme of welfare work in the factory, sick benefit, recreation clubs, dining hall, and the use of the premium system in encouraging output.

The extended use of the range-finder on board ship made it imperative to control the fire of the guns; in 1905, Prof. Barr invented a step-by-step motor for signalling electrically from range-finder to gun, and from that date onwards many instruments were designed and patented which have gradually developed into the intricate fire-control system of the modern warship. An electrically operated torsion-meter for measuring the power developed by large prime movers was developed in 1912.

The War inevitably involved the firm of Barr and Stroud in greatly increased production of its usual work, and in this activity Prof. Barr took his share, but he also developed a number of instruments for military and naval use—the torpedo depth recorder, the rangetaker-tester, a bomb-dropping sight for aircraft, the submarine periscope—and took a keen interest in the manufacture of optical glass by improved methods. After the War, the attention of his firm was necessarily turned towards civilian work, and he perfected Dr. E. E. Fournier d'Albe's optophone for enabling the blind to read ordinary type, and a series of instruments for producing contour maps from photographs taken from an aeroplane, by which means survey work in new and unexplored countries has been very greatly simplified.

Prof. Barr was elected a fellow of the Royal Society in 1923, was a member of the Institutions of Civil and of Mechanical Engineers and the Institute of Metals, and was made doctor of laws of the University of Glasgow in 1914.

Prof. Barr will be remembered by his many students for his clear, direct, convincing explanations of the fundamental principles underlying any problem. He was not content to teach engineering as a mere branch of applied science, but aimed to develop in his students the power of thinking out for themselves the laws of science on which the particular work of the moment was based. He was a ready and lucid speaker, and drew upon a fund of humour and wide human sympathies which enabled him to command the interest and constant attention of his classes and to get into close touch with his students individually outside the lecture room. From boyhood he showed inventive talent, and all his life his mind was occupied with the solution of a long series of mechanical problems; while to the development of his patents on a manufacturing scale he applied an integrity which would not brook the least lapse from workmanship of the highest class. He brought to the management of his business a well-balanced judgment, a rapidity of thought that enabled him to come to a sound conclusion quickly, a clearness of mind by which he distinguished the commercial and financial aspects of a problem from the practical and scientific, and a sympathy with his fellow-workers and employees which has found expression in a workshop and organisation where every facility for the well-being of those engaged in the work is provided. His death will be deeply felt by the members of his family, his daughter and two sons (his wife died three years ago, and his second son was killed in France in 1915), by his business associates, and by a wide circle of friends and past students.

WE regret to record the death of Mrs. Howes, widow of the late Prof. G. B. Howes, who succeeded Huxley at the Royal College of Science. Mrs Howes died in Kenya Colony, at the home of her daughter, Mrs. Rae, on July 4, aged seventy-nine years. Forty years ago she made the home of her husband a resort for the younger school of biologists, and did much to forward the cause of modern biology.

WE regret to announce the following deaths:

Prof. W. E. Dixon, F.R.S., University lecturer in pharmacology at Cambridge and formerly professor of pharmacology in King's College, London, on Aug. 16.

Prof. J. W. Hinchley, professor of chemical engineering in the Imperial College of Science and Technology and secretary of the Institution of Chemical Engineers, on Aug. 13, aged sixty years.