

honours, and his D.Sc. degree in 1921 for a thesis on "Accurate Viscosity Determination of Fluids". His published papers deal with elastic hysteresis in steel, elastic properties of steel at moderately high temperatures, and viscosity of liquids; but his research work at the Royal Naval College has not been published.

Dr. Rowett was of a very retiring and modest nature, a skilful engineer and an ingenious research worker of great ability, very thorough in all he did. His work was his hobby, and forms a lasting memorial to him. Ill-health overtook him in his prime and he died at the early age of forty-six years. J. B. H.

WE regret to announce the following deaths:

Prof. A. V. Fomine, director of the Botanical Museum of the Ukrainian Academy of Sciences, and professor of botany in the University of Kiev, an authority on the Cryptogams and plant geography, on October 16, aged sixty-six years.

Prof. J. G. Goodman, emeritus professor of civil and mechanical engineering in the University of Leeds, on October 28, aged seventy-three years.

Prof. Frederick L. Ransome, professor of economic geology in the California Institute of Technology, on October 6, aged sixty-seven years.

## News and Views

Sir Charles Sherrington, O.M., G.B.E., F.R.S.

THE official announcement of Sir Charles Sherrington's retirement from the Waynflete professorship of physiology at Oxford recalls the simple but moving ceremony which took place at the Oxford meeting of the Physiological Society in July. Sir Charles was then presented with an address recording his long association with the Society, and expressing the esteem and affection of his fellow members. These feelings are world-wide. Sir Charles's studies of the nervous system will command the admiration of neurologists for years to come, but those who have been privileged to know him personally have far more to admire. During his tenure of the chair at Oxford, the conception of the nervous system which he originated has become part of the classical doctrine of physiology. At the same time, his more recent studies have made Oxford the chief centre in Great Britain for research on the central nervous system. He has been president of the Royal Society, has served on countless scientific committees, and recently has done much for the improvement of scientific bibliography. Though we may regret the loss from active work of such a leader, we cannot grudge a rest and change of scene to one whose example has so enriched the scientific life of our time.

### Progress in Medical Science

IN his Sir Halley Stewart Trust Lecture on October 31 in the Memorial Hall, Farringdon Street, London, E.C.4, Prof. Edward Mellanby, secretary of the Medical Research Council, discussed recent developments in medical science. He said that it is only in the past hundred years that medicine has made substantial advance. This relatively dormant state of knowledge lasting over a period of thousands of years was due partly to the idea that disease was caused by the invasion of the body by evil spirits—a view held by the Egyptians, Babylonians and Assyrians—and partly to the belief that man's body was of no account as compared with his soul—a view held

throughout the Middle Ages. Landmarks of medical advancement were introduced on the anatomical side by the Italian school as represented by Vesalius and on the physiological side by Harvey, who gave the first classical demonstration of the possibilities of acquiring knowledge by the experimental method. By the time of Pasteur, the field was set for development and intensive study. Pasteur's work on enzyme action immediately opened up a new chapter of knowledge and led to the work of Lister on antiseptics and of Koch on bacterial disease in general. In the present century, medical research has become more and more intense. In Great Britain, the Medical Research Council was initiated in 1913 and, besides using its own public funds, it has the privilege of working in close association with the efforts of private benefactors such as the Lister Institute of Preventive Medicine, founded by Lord Iveagh, the Rockefeller Foundation, and the trusts formed by Sir Otto Beit and Sir Halley Stewart. On the administrative side, the greatly increased activities of the Ministry of Health and local health authorities have resulted in the application of new knowledge acquired by research to the practical problems of health.

PROF. MELLANBY gave some results showing the effect of advancement in medical science on mortality rates. The infant mortality rate in the period 1896–1900 was 156 per 1,000 births registered; in 1934 it was 59. The mortality rate of men between 45 and 55 years of age was 20.3 per 1,000 males in the period 1870 to 1875; in the period 1926–30 it was 11.7. Progress in medical science has tended in recent years to centre round three types of knowledge affecting: (1) Problems of infection—protozoal, bacterial and virus—and their control by raising the immunity. In this way such diseases as smallpox, measles, diphtheria, meningitis and scarlet fever have been influenced. In a group of 399 London children recently treated by immune serum, not one had died of measles, whereas in a control group the death rate

was 5 per cent. (2) Diseases due to abnormality of internal secretion, such as diabetes, pernicious anæmia, Addison's disease, myxœdema, cretinism and simple goitre, tetany and osteitis fibrosa cystica. As an example, reference was made to the latest results obtained in the treatment of pernicious anæmia by the pure or nearly pure anti-anæmic principle of liver as recently isolated by Dakin and West. So little as 0.2 gm. injected once weekly was a remarkable curative effect on this otherwise deadly disease. (3) Nutritional disease: Dr. Mellanby illustrated this subject by showing how discoveries leading to the cause, prevention and cure of rickets had been obtained. He also dealt with the problem of defective teeth and said that dental decay will remain a scourge in Great Britain unless methods are adopted of feeding infants and children on diets which would produce perfectly formed instead of the present imperfectly formed teeth. He described the beneficial effect of such substances as abundant milk, egg-yolk, fish and animal fats on dental structure, as compared with the harmful effect of cereals such as oatmeal, flour and other similar substances unless balanced by sufficient milk.

#### The Case Against Vaccination

IN his Chadwick Public Lecture delivered at the Royal Society of Tropical Medicine and Hygiene, on November 1, Dr. C. Killick Millard discussed the vaccination question. In the past, one either had to believe in vaccination or to disbelieve in it. Dr. Millard said that his faith in vaccination, as a means for protecting the individual against smallpox, is just as strong and unassailable as ever it was, but he recognises that, as a State institution for protecting the community, infant vaccination has been largely a failure. Until recently, it was taught that the neglect of infant vaccination entailed serious and imminent risk of a return of smallpox mortality. The experience of the City of Leicester, which abandoned infant vaccination fifty years ago, and yet where, during the last thirty years, there have been only two deaths from smallpox, makes such a belief difficult. Since the War, an ultra-mild form of smallpox has appeared in Great Britain and considerable spread has taken place. It has now been officially recognised as a distinct variety, which breeds true, and it has been accorded a separate name, 'variola minor', to distinguish it from the severe form of smallpox, 'variola major'. As a matter of fact, although not officially recognised as such, variola minor existed in Great Britain long before the War, and in certain countries, under the name of 'alastrim', it has existed from time immemorial. Variola minor presents quite a different administrative problem from variola major. Compared with the latter it is non-fatal, non-disfiguring, non-loathsome. In some ways it is no more serious than vaccination, so that no case can be made out for retaining compulsory vaccination merely on account of variola minor. Dr. Millard concluded by expressing the opinion that the repeal of the vaccination Acts is now over-due.

#### Liberation of the Electron

FOR his Friday evening discourse at the Royal Institution on November 1, Mr. C. C. Paterson took as his subject "The Liberation of the Electron". He described how the whole art of electrical engineering had been born again when the electricity, which the older engineers had confined to wires and cables, was liberated from them by the physicist and handed back to the engineer to be exploited in the wire-less valve, the photo-electric cell, the cathode ray tube, and other devices which use 'free electrons'. He demonstrated the essential causes which enabled these devices to establish broadcasting, long-distance telephony, television, and similar social services. The secret of the revolution is that a stream of free electrons, whether in a vacuum or a gas, can be manipulated with such facility that the electricity can be increased or decreased at the rate of millions of times per second, or alternatively as slowly as desired, and no limit is set to the amount of energy which can be so controlled. So much of what we see and hear consists, if analysed, of extremely rapid happenings. The eye and the ear are unconscious of these high-speed fluctuations and vibrations, although sensitive to them. In order that we may faithfully reproduce and transmit these very rapid oscillations and variations, it is necessary to make exact electrical copies of them. This is done by suitably controlling a stream of free electrons. Mr. Paterson went on to point out how the free electron is also being used in astounding ways in the art of electric lighting. The many coloured luminous discharge tubes used for display purposes in the streets are due to the action of 'free electrons'. They have led the way to more brilliant and more efficient industrial light sources. Some of them give much more light for the electricity consumed than existing filament lamps. The effects are the result of high-speed (up to six million miles an hour) encounters between free electrons and the gas atoms in the tubes.

#### Science and Unemployment

IN his presidential address to the Institution of Electrical Engineers delivered on October 24, Mr. J. M. Kennedy dealt mainly with the subject of the distribution of electricity. It is obvious that hand labour is gradually being replaced by mechanical power, and that a large fraction of the labour so displaced is unable to find further employment. There are certain depressed areas in which unemployment is particularly rife owing to the dying out of industries or their transfer to more suitable areas. It is now generally recognised that lack of forethought and absence of planning for the future during the recent rapid industrial development has been one of the main factors that has allowed these industrial troubles to develop. Absence of initiative and the policy of letting things drift often prevent real progress from being made. Mr. Kennedy discussed the relation between advancing applications of science and unemployment. He does not agree with those who fear that any steps taken to plan industry so as to re-absorb the present number of unemployed