

margin has been sufficient to neutralise much of the writing down of capital, reduction of wages, and economies of re-organisation by which productive costs have been reduced. By keeping up the cost of living, while wholesale prices are falling, these costs also make it difficult to ask for any reduction in wages. So far, then, as retail distribution provides additional employment by its expansion, it probably does not succeed in compensating for reduction in industrial employment, which the cost it imposes on industry involves.

The second group of expanding industries is the building, building material, and furnishing industries. Together these account for 211,000 increase in the five years. The War-time arrears have now been made up, so that further expansion will be limited to the needs of the increase in population and of replacement with the aid of further subsidies. The case of the third group is similar. These are industries in which expansion has been stimulated by protection, but would have taken place without that stimulus, under the more economic stimulus of technical invention; motor manufacture and artificial silk are the chief members of the group. It is difficult to estimate how much of the growth was dependent on protection and merely a diversion from unprotected industries; but the aggregate expansion of the two together would not be sufficient to compensate for half the contraction in coal alone.

It remains in conclusion to point out that the loss of plasticity, and the adverse effects upon employment that may follow, are not necessary and inevitable consequences of the extension of collective settlements, but, in so far as they are attributable to it, due rather to an obvious defect in the machinery and current practice of collective bargaining than to anything inherent in collective bargaining as such.

The defect in the machinery for wage-negotiation to which the present unemployment points is the

purely sectional character of its deliberations. It is no one's business to consider wages as a whole: there is no authority charged with the duty of reminding wages boards of their responsibility to industry in general. Collective bargaining must fail in securing an accurate adjustment of wages to industrial conditions so long as it is confined to negotiations over wages in individual trades and industries. If it is to continue, it must be supplemented by some device for ensuring that the negotiators in each trade and industry have regard to the effect of their determinations upon other trades and industries, and for compelling them to contemplate the needs of industry as a whole.

Moreover, by considering only its own needs and interests, an industry might pursue a policy that was restrictive in effect, though regulative in form. If all industries and all trades pursue such a policy—and all now have the requisite organisation—and maintain rates of wages that restrict employment, there will be excluded a mass of workers who must either be absorbed by new industries or remain unemployed. If there are new industries capable of absorbing them, well and good; but at the present time it would seem that there are not. The index or barometer, therefore, to which trade union and arbitration authorities' attention should be directed, is not solely, or even principally, unemployment in the industry immediately under consideration, but the rate of expansion of industry as a whole.

The task of co-ordinating wage-settlements in different industries, and of securing in each the consideration of such apparently remote factors as the productivity and rate of expansion of industry as a whole, may be too much for the spontaneous democratic machinery by which collective settlements are negotiated at present; but the alternative is almost certainly a breakdown of that machinery under the pressure of a growing problem of unemployment.

Obituary.

DR. E. S. BIELER.

A TELEGRAM from the Prime Minister of Australia, sent on July 26, announced the death of E. S. Bieler on the previous day from pneumonia. He died after thirty-two hours' illness at Geraldton, Western Australia, at the age of thirty-five. He was engaged with Dr. Boughton Edge and others in geophysical exploration under the joint auspices of the British Empire Marketing Board and the Commonwealth of Australia. He had received two years' leave of absence from McGill University for this important expedition.

Educated at Montreal High School, Bieler became a distinguished honour student in mathematics and physics at McGill University. Soon after the War began he joined the First McGill University Company and then served with the Princess Patricia's Light Infantry, receiving a commission in the Canadian Field Artillery. After being twice wounded he was transferred to the Anti-submarine Division and worked under Sir

William Bragg at applied research methods at Scapa Flow and on the north coast of France. After the War he received an 1851 Exhibition Scholarship and went to Caius College, Cambridge, working as a research student at the Cavendish Laboratory at a time when Sir Ernest Rutherford and Dr. J. Chadwick were bombarding the nuclei of atoms with alpha particles.

The idea of a barrier round the nucleus resulted from this work and Rutherford has spoken to me with enthusiasm of Bieler's research. After taking his Ph.D. degree at Cambridge he became assistant professor of physics at McGill, and he directed his attention to the susceptibilities of the alkali metals and the Hall effect in them, believing that the greatest progress could be made in that manner. He communicated some admirable summaries on magnetism and on the Fermi-Dirac theory to the *Journal of the Franklin Institute*; and published papers also on electrical measurements.

Bieler had, in 1917, done research work in

acoustics at Father Point with Dr. L. V. King, to whom he was indebted for much of his training in mathematics and physics. He also became interested in geophysical prospecting in northern Quebec, and with Mr. H. G. I. Watson invented and patented a method for searching for ore bodies by measuring the ratio of the axis minor to the axis major of the ellipse of polarisation. He was thus by experience well equipped to become deputy director of the geophysical expedition, and his life in camp and in the Canadian bush seemed a guarantee of physical fitness also. He was a man of eagerness and enthusiasm with well-balanced judgment and sound scientific acumen. His family and his friends and colleagues have lost a man of sterling character and McGill University has lost a physicist hard indeed to replace. A. S. EVE.

WE regret to announce the following deaths:

Sir Alfred Bateman, K.C.M.G., formerly Comptroller-General of Commerce, Trade and Statistics of the Board of Trade and president in 1897 of the Royal Statistical Society, on Aug. 7, aged eighty-four years.

Prof. L. H. Cooke, professor of mine surveying at the Imperial College of Science and author of many improvements and inventions relating to surveying instruments, on Aug. 23.

Prof. Thomas Eagleson Gordon, president of the Royal College of Surgeons in Ireland and professor of surgery at Trinity College, Dublin, on July 24, aged sixty-two years.

Dr. Paul A. Lewis, of the Department of Animal Pathology of the Rockefeller Institute for Medical Research, known for work on immunisation and related subjects, who died of yellow fever while studying that disease in Brazil, on June 30, aged fifty years.

Prof. John A. Mandel, professor of chemistry and physiological chemistry in the University and Bellevue Hospital Medical College, New York, who worked mainly at the chemistry of the nucleic acids, on May 5, aged sixty-three years.

Rear-Admiral Albert P. Niblack, K.C.M.G., C.V.O., United States Navy (retired), president since 1927 of the Directing Committee of the International Hydrographic Bureau, on Aug. 20, aged seventy years.

Karl Auer, Ritter von Welsbach, inventor of the incandescent gas light and of the osmium filament electric lamp, on Aug. 4, aged seventy years.

News and Views.

ON Sept. 7 occur the centenaries of the births of the American geologist Hayden and the German chemist Kekulé. Ferdinand Vandever Hayden, who was born at Westfield, Mass., graduated from Oberlin College, and in 1853 took his M.D. at Albany College, and by James Hall was induced to join an exploring party to Nebraska. During the Civil War he served as a surgeon, in 1865 became professor of geology in the University of Pennsylvania, and for twelve years, 1867-79, was geologist in charge of the United States Geological Survey of the Territories. His labours resulted in a most valuable series of reports in all branches of national history and economic science. He first made known the basalt plateau in Oregon and Washington through which the Columbia River had channelled its course; he described in 1871 the wonderful lava plateau in north-western Wyoming on the banks of the Yellowstone River, with geysers, hot springs, mud volcanoes, and extinct volcanic hills, and the idea of the great National Yellowstone Park was his. Hayden died at Philadelphia on Dec. 22, 1887, and the following year his widow endowed the Hayden Medal of the Academy of Natural Sciences of Philadelphia for work in geology or palæontology, among the recipients of which have been Suess, Huxley, Daubreé, and Geikie.

FRIEDRICH AUGUST KEKULÉ, also born on Sept. 7, 1829, was sent from the Darmstadt Gymnasium to Giessen to study architecture. He had already displayed remarkable ability and at Giessen was attracted to chemistry by the lectures of Liebig. At twenty-one years of age he published his first piece of research. A year spent in Paris led to an acquaintance with Dumas, Wurtz, Cahours, Regnault, and with Gerhardt, whose treatise on organic chemistry he read in manuscript. A year or two later Kekulé

became assistant to Stenhouse at St. Bartholomew's Hospital, London, and it was in London, as is known from his addresses, that his ideas with regard to structural chemistry began to take shape. In 1856 he became a privat docent at Heidelberg; in 1859 professor of chemistry in the University of Ghent, and in 1867 he was called to Bonn, where he found himself head of the palatial laboratory just erected to Hofmann's design. Kekulé had already in 1858 published his views on the linking of atoms, and in 1865 his memoir on the theory of the structure of benzene, containing what Japp in 1898 called the most brilliant piece of scientific prediction in the whole range of chemistry. Distinguished as a thinker, teacher, and investigator, Kekulé's merits never lacked recognition; he was feted three times by his students, and in 1895 the German Emperor ennobled him with the title Kekule von Stradonitz. It was then he dropped the accent on the final e. He died of heart failure on July 13, 1896, and seven years later his statue was erected in front of the laboratory at Bonn. Among his students were Baeyer, Ladenburg, Dewar, Thorpe, Van 't Hoff, and Japp, the last of whom in 1898 delivered the Kekulé Memorial Lecture to the Chemical Society.

THE estate of the late Mr. Oldfield Thomas, who died on June 16 last, has been sworn for probate at £42,613, with net personalty £37,374. By his will and four codicils he made numerous bequests for scientific and charitable purposes. Among these the most interesting are legacies of £500 each to the Society for the Promotion of Nature Reserves and the London Playing Fields Society, £300 to the National Lending Library for the Blind, £200 each to the Decimal Association and the Nature Cure Association, and £100 to the Simplified Spelling Society. To the