

pire, special attention being given to Australia, the United Kingdom, Canada, and India, which are the principal British sources of supply; next come references to the more important deposits in foreign countries; then follow sections dealing with the valuation, concentration, and smelting of the ores, the various types of the commercial metal (spelter), with references to impurities, grades, and prices; the final section deals with the properties and utilisation of the metal, whether as such, in the form of alloys, or pigments.

There is an obvious misprint on p. 54 where it is stated that the distillation retorts are "about 8 ft. in diameter." For "feet" read "inches."

THE DECLINE IN THE BIRTH-RATE.

IN a judicial way Dr. Millard discusses, in the paper before us,¹ the problem of the fall of the birth-rate in its relation to social welfare. He does not share the orthodox view that the decline of the birth-rate is in itself a deplorable fact, or that deliberate birth-control is necessarily to be regarded with disapprobation. On the contrary, he advances substantial arguments in support of the following conclusions. The fall in the birth-rate is a general phenomenon among civilised nations. It is due, not to diminished natural fertility, but to deliberate birth-control. It is not in itself an evidence of national decadence; it may be an expression of advancing civilisation—of a more conscious control of life. Birth-control is the civilised substitute for those natural checks to the rapid growth of population—scarcity, disease, and war—which have always operated in the past. Rapidly growing populations in countries with circumscribed territories are apt to give rise to political unrest and to serve as provocatives to war. International competition in birth-rates is correlated with a competition in armaments, and both are undesirable.

The prosperity of Britain is at present wrapped up with the abundant supply of cheap coal, and the more rapidly the population of this country increases, the sooner will the beginning of the end of our coal-fields manifest itself. To postpone the approach of what the author calls the dark and gloomy epoch (who knows what other stores of energy may not be tapped before the coal is exhausted?), an increased birth-control may usefully operate. But there are more immediate reasons for advocating birth-control. It is far from being race-suicide; it is a natural ally of the maternity and child welfare movement. A low birth-rate is closely correlated with a low rate of infantile mortality. A high birth-rate usually means great infantile mortality. "Birth-control is an essential factor in the campaign against poverty. It is calculated to reduce the supply of unskilled labour, to increase efficiency, to raise wages, and to encourage a higher standard of life." It seems almost as sure a panacea as Prohibition!

¹ "Population and Birth-Control." Presidential address to the Leicester Literary and Philosophical Society, 1917. By Dr. C. Killick Millard. Pp. 48. (Leicester, 1917.) Price 1s.

We think, indeed, that Dr. Millard is altogether too enthusiastic over birth-control as we know it at present. Perhaps its methods are improving; but there seems more than a touch of irony in the statement that married people, if in doubt as to the best methods of birth-control to be adopted, "will naturally look to the medical profession for advice." How abundant and helpful that expert advice has been during the last quarter of a century!

The author has a fine passage on the joy and discipline of parenthood, and we agree with him that the availability of trustworthy counsel will encourage early marriages, which are on the victory side, we hope, in the campaign against "immorality" and venereal diseases. In any case, there is much to be said for Dr. Millard's summing-up, that "properly used, and not abused, birth-control is a valuable eugenic instrument, capable, by restricting the multiplication of the least fit, of greatly raising the quality of the race."

SIR ALEXANDER PEDLER, F.R.S.

THE announcement of the sudden death of Sir Alexander Pedler, while attending a Committee meeting at the Ministry of Munitions on Monday, May 13, came as a shock and great surprise to his many friends. There had been, among the majority of them, no suspicion of weakness, and to all appearance he was a man who might confidently look forward to many more years of useful work.

Pedler received his early education at the City of London School. The present writer made his acquaintance in October, 1866, when, at the age of seventeen, he won a Bell scholarship and began work as a student in the laboratory of the Pharmaceutical Society. Here he went through the usual course of analytical work, and at the end of the session was awarded a certificate of honour in practical chemistry. Before leaving, he began a piece of research suggested to him by the writer, who was then demonstrator in the school. It was with great regret that he parted with the promising young student, who had, by this time, decided to leave the comparatively narrow field of pharmacy and proceeded to place himself under Prof. (afterwards Sir Edward) Frankland at the Royal College of Chemistry, then in Oxford Street. There he soon entered on research and carried out the separation of the amylic alcohols by Pasteur's process. From the optically active and inactive alcohols thus obtained he prepared the corresponding valeric acids, and gave an account of the work to the Chemical Society in 1868 (J. Chem. Soc., N.S. 6, 74). Further work in this direction was interrupted by his taking part in the solar eclipse expedition of that year.

From 1871 Pedler served for two years as lecture demonstrator to Sir Edward Frankland in the Royal College of Chemistry in succession to Mr. Herbert McLeod, who had been appointed to the professorship of chemistry in the then newly instituted Royal Engineering College at Coopers

Hill. At that time he assisted in the research work on gaseous spectra in which Sir Edward Frankland and Sir Norman Lockyer were jointly occupied. This naturally turned Pedler's attention to the fascinating problems connected with the physical constitution of the sun and the stars. Consequently, on receiving, in 1873, the appointment as professor of chemistry in the Presidency College, Calcutta, it is not surprising to find that it was some years before he again gave special attention to ordinary terrestrial chemistry. The experience already gained qualified him for observation of meteorological phenomena, and soon after his arrival in India he was charged with special duty in connection with the eclipse expedition in 1875.

At this time, having been born in 1849, Pedler was still a very young man, and before quitting this portion of his career those who knew him in those early days will gladly recall the charming features of his character which made him not only popular in youth, but, remaining unchanged to his latest years, contributed so materially to his success in official life. Chemists who attend the long-established Chemical Dining Club are probably not all aware that it was started by Pedler in or about 1872, and that he acted as secretary so long as he remained in England.

In India, Pedler retained the professorship in Calcutta together with the office of Meteorological Reporter to the Government of Bengal for twenty-two years. He then became principal of the college and vice-chancellor of the Calcutta University. In 1899, he was appointed Minister of Public Instruction in Bengal and additional member of the Legislative Council. These successive steps in official life serve as sufficient explanation of the fact that Pedler's original contributions to scientific chemical literature were limited to the one paper on valeric acids, already mentioned, and several which naturally arose out of the conditions of his occupation in India. Soon after his arrival in that country he examined the coal-gas and the water supplies of Calcutta. In 1878 he sent home a paper on the cobra poison, which was printed in the Proceedings of the Royal Society (vol. xxvii., p. 17); while, in 1890, he contributed to the Journal of the Chemical Society three papers the titles of which show that he was utilising opportunities, previously neglected by chemists, of studying the action of tropical sunlight on chemical change.

On his retirement, Pedler received the honour of knighthood, and on his return to England, in 1906, he speedily found occupation in public work. He became honorary secretary to the British Science Guild, which owes much to his devoted service; and on the outbreak of war he took up active duties connected with the research department of the Ministry of Munitions.

Pedler was twice married, but left no children. His widow was the youngest daughter of the late Mr. Warburton, R.N., of Dedham.

W. A. T.

NOTES.

THE *Financier and Bullionist* of May 14 contains an important article by Sir William Tilden under the title "The Present Position of the Dye Question." The article is addressed mainly to business men, and is, therefore, pretty free from chemical technicalities. It sets forth clearly the causes—partly commercial, partly educational—which led to the decline of the British manufacture and the ascendancy and ultimate practical monopoly of the industry by Germany. The most serious weapon in the hand of the enemy, it is pointed out, is the position of respect which in Germany is accorded to science. The close relation of the universities to the industries of the country, and the fact that the German dye-makers have at their disposal a large body of trained experts, many of them distinguished chemists, who are not only employed in the works, but are also on the directorate, are the chief conditions of the success Germany has achieved in this direction. Sir Albert Stanley, President of the Board of Trade, announced in the House of Commons on May 15 the course which the Board, on behalf of the Government, proposes to take, among other things, in respect to the dye industry. The proposals include further financial aid to manufacturers of special colours and protection for a period of ten years after the war by controlling the importation of foreign dyestuffs by a system of licences. He also stated that negotiations were in progress for the amalgamation of British Dyes, Ltd., and Messrs. Levinstein, Ltd., who were the most important of the dye manufacturers in this country. The arrangements proposed provided for the new company being permanently under British control, for Government representation on the board of directors, and for securing reasonable prices and equitable distribution of the products to the dye-users, so as to avoid anything in the nature of a monopoly. This is all good so far as it goes, but the Government, any more than the man in the street, has not yet grasped the idea that this is a chemical business in the first place, and that to leave the direction chiefly in the hands of Government officials while the chemist is relegated to a subordinate position is to neglect the conditions which have been proved by long experience in Germany to be the only assurance of permanent security and success.

ATTENTION is directed in the *Times Engineering Supplement* for May to the part which technical production is taking in Germany in advancing the fertiliser problem, especially with regard to fertilisers capable of production from synthetic ammonia. For the manufacture of cheap hydrogen, a most essential factor in successful commercial ammonia synthesis, the Badische Anilin- & Soda-Fabrik has developed a catalytic hydrogen process in which large quantities of carbon dioxide are simultaneously obtained. The titles of a series of patents applied for by this company reveal the ideas whereby this by-product is to be utilised. A patent dated August 7, 1914, is concerned with "fertiliser." Three patents in December of the same year cover the manufacture of urea and of products and compounds for use in such manufacture. In June, 1915, a patent application for the manufacture of carbonic acid compounds of ammonia was filed; whilst in March, 1916, a further patent of the same company for fertiliser and method of fertilising was indicated. Obviously the object aimed at is the utilisation of the available carbonic acid from the hydrogen process in preference to the more expensive sulphuric acid necessary for the production of ammonium sulphate. The manufacture of urea would yield a fertiliser containing 43.7 per