direct. We have now become accustomed to the use of solid carbon dioxide for the refrigeration on the tricycles in which ice-cream is transported in the big towns. It has, however, many other industrial uses, and as many as 60,000–70,000 tons are now produced per annum in the United States. A surprising fact is that its loss by evaporation is quite moderate, being about 1–2 per cent by weight in 24 hours, on blocks of the ordinary size. It is also interesting to note that the gas itself, which surrounds the solid block, is a poor thermal conductor. This atmosphere of carbon dioxide is very useful when the solid material—'dry ice'—is used for the preservation of meat and fruit, since it prolongs the life of the latter, and tends to inhibit the growth of moulds and bacteria in the former case.

A growing, but less-known, use of 'dry ice' is in the machine shop, where it can be used for shrinking one part on to another, so that after the inner one warms up and expands, the joint is of enormous strength.

Solid carbon dioxide, like liquid oxygen, has removed the necessity for transporting heavy empty cylinders when supplies of the gas are required at a distance. By purchasing a block of 'dry ice', a customer with a suitable pressure vessel can obtain a supply of carbon dioxide gas from a cylinder which need never leave his premises. He simply inserts the block, closes the vessel and allows the carbon dioxide to evaporate. The gas so obtained is much purer than that from which the 'dry ice' was originally made, since the process has many of the features of the chemist's purification process of recrystallization.

Taken together, the seven lectures illustrate in a forceful manner the strides which have been made in the science and art of low temperature production and utilization, and also the interdependence of pure and applied science. The authorities of the Science Museum are to be congratulated on the provision of the course, which must have added very considerably to the interest of the Very Low Temperatures Exhibition itself, valuable though it would have been without them.

J. H. A.

Obituary

Sir William Hamer

BY the death on July 7 of Sir William Heaton Hamer, at the age of seventy-four years, epidemiology has been deprived of one of its most zealous students.

William Hamer (he was knighted in 1923) was a scholar of Christ's College, Cambridge, and graduated twelfth wrangler in 1882. After graduating in medicine, he entered the Medical Department of the London County Council and rose to be Medical Officer in 1911, retiring in 1925.

Hamer's mathematical training showed itself in some of his earlier researches, particularly his elucidation of the periodicity of measles in London, which he attributed to rhythmic variation in the number of susceptibles in the population. His work on these lines was afterwards extended by the late H. E. Soper and, although it is now held that the phenomenon is not quite so simple as Hamer suggested, there is little doubt that changes in the proportion of susceptibles form an important element of the general problem.

Hamer was an acute critic of popular epidemiological theories, particularly those based upon bacteriological findings, and a sturdy champion of the doctrine of epidemic constitutions, to which he devoted years of study. The "English Hippocrates", Thomas Sydenham, propounded the general doctrine that all forms of acute diseases prevailing at the same time were linked together by common features in consequence of some general, possibly cosmic, influence which he was unable to define. Hamer attempted to bring this rather vague hypothesis into conformity with modern scientific results. It is generally agreed that, in pointing out the chronological relation of prevalences of obscure nervous diseases to pandemics of influenza, and in explaining the nature of such mysterious epidemics as the 'sweats' of the sixteenth century, Hamer made important contributions to knowledge. To most students, however, his later writings were difficult to follow, and he seemed to exaggerate the importance of Sydenham's views. At his best, he was a most stimulating writer, and he continued the scholarly tradition of Charles Creighton, linking modern science to the philosophical outlook of the ancient masters.

Mr. W. Newbold

THE death, on June 24, of William Newbold, classical scholar, self-taught mathematician, statistician and biologist, at the age of fifty-eight years, just as he was within sight of retirement from his duties as an inspector of secondary schools under the Board of Education, and was wishing for leisure to extend his biological investigations, was a great shock to the large circle of friends to whom he had endeared himself by his ever-ready help and wise and kindly counsel.

Though Newbold never lost his delight in classical and archæological studies, his latent first-rate mathe-