rhythm, and verse structure. The range of the last may be gathered from its concluding paragraph, which tells us that "the child is now ready for the more difficult problems of anacrusis, catalexis, irregular feet, and irregular pauses." There is nothing of history or geography in the book. No doubt the didactic materials are still in preparation. J. A. G.

MODERN INDUSTRY.

(1) *What Industry Owes to Chemical Science.* By R. B. Pilcher and F. Butler-Jones. With an introduction by Sir G. Beilby. Pp. xiv+150. (London: Constable and Co., Ltd., 1918.) Price 3*s.* net.

(2) *Some Problems of Modern Industry: Being the Watt University Lecture for* 1918. By W. C. Hichens. Pp. 61. (London: Nisbet and Co., Ltd., 1918.) Price 6*d.* net.

(1) IF British trade is to hold its own in face of the acute competition which is to be expected, great alterations must be effected, and these two books point out some directions in which improvements may be made. Messrs. Pilcher and Butler-Jones's handbook is a capital *résumé* of the improvements made in metallurgy and in the manufacture of dyes, explosives, glass, pottery, and many other commodities by the application of scientific research. It is very readable, and gives in a handy form an accurate and interesting account of the growth and results of industrial chemistry. It shows how much we owe to British and French chemists, and avoids a common mistake which gives the main credit in this matter to Germany. It is the most compact and convenient history of industrial chemistry which we have come across. As a rule, the authors have kept to general principles, and this is wise, because the book is not intended for experts in each particular trade, but for the public as a whole, and because no one or two men can write on the various industries concerned with first-hand knowledge of all, but must depend on other books for a large part of the information.

In some cases, where the authors have gone into detail—for example, in describing the Pattinson and Parkes processes for lead refining—the details show that the authors have no recent actual experience of the methods employed in this country, but have probably relied on text-books. In dealing with monazite sand the large and rich deposits in the south of India might be mentioned, and the successful diversion of these sources from German hands to our own. In relation to the competition between artificial and natural indigo the recent action of the Indian Government in applying modern scientific methods to the production and marketing of natural indigo should be recognised. Would that all Governments and Government Departments were equally broad-minded and far-seeing! In this country the permanent Government officials are usually recruited from a class which, though aware of the importance of chemistry, is so out of touch with chemists, and so lacking in sympathy with chemical ideas, that it is hard for them to realise what is really required by the country. The average Member of Parliament and the average man of business do not recognise that a first-class man of science is, as a rule, valuable only in his own subject. Messrs. Pilcher and Butler-Jones's book will show the public at large how enormous the science has become, and how stupid it is to expect an electrician to be an authority on paraffin oils, or a genius in spectroscopic work on gases to be a sound guide in the manufacture of artificial rubber.

(2) As chairman of Cammell, Laird, and Co., Mr. Hichens is able to look at modern industry in a broad manner. He deals mainly with ethical questions, the relations with labour, conditions of work, the right of the State to a share in profits, and so on. He has a pleasant style of writing, and his commercial training has not destroyed his power of refreshing his mind and the minds of his audience by recalling some picture of a bygone age before trade-unions or excess profits were thought of. It is impossible in an hour's lecture to do more than indicate the sort of problem to be tackled. Mr. Hichens has done this in an agreeable and interesting manner, and his lecture should appeal to all students of social problems.

BALLISTICS.

Text-book of Ordnance and Gunnery. By Lt.-Col. W. H. Tschappat. Pp. x+705. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1917.) Price 30*s.* net.

AT no previous time in history has so much attention been paid to artillery as during the present war. The unprecedented number and variety of guns in use enable a mass of evidence, sufficient to prove or disprove any theory which is considered worthy of a practical trial, to be accumulated in a very short space of time. Moreover, it is almost certain that all the belligerent countries are liberally spending money on researches into the various branches of the art of gunnery, and employing, for this purpose, more men of scientific reputation and mechanical genius than have ever considered the subject seriously before. As a natural consequence, "ordnance and gunnery" must be in a state of rapid development, and it would therefore appear to be a somewhat unfortunate moment for the publication of Col. Tschappat's book, which is, so largely, merely a revision of an excellent book with the same title by Lt.-Col. Lissak.

That the revision has effected a decided improvement cannot be denied, but there is little that is new, of any importance, to be found in it. The major alteration is in the treatment of interior ballistics. Col. Lissak used Ingall's method. In the volume under review a carefully elaborated method of producing the pressure and velocity curves by integrating the energy equations is presented. The method has the advantage that a complete calculation of a gun can be made without any firing data, but the process seems laborious, and there does not seem to be any means provided for quickly finding the point