The Government Committee on the Chemical Trades is composed of men who will command the confidence of everyone, and their recommendations will have great weight. It must not be forgotten, however, that nearly all trades would be benefited by scientific help. The attitude of mind induced by scientific education is just the one required for the successful development of a business. If the manufacturers as a whole would realise this, they would see to it that their sons or those who are to carry on their business, have a thoroughly good scientific education, such as may now be got at many of the Universities and technical colleges in the country. It is not the classical or the modern side of our schools which is going to supply the successful manufacturer of to-morrow, it is the side where a man is taught to bring all his useful knowledge to bear on the achievement of success. Mr. Illingworth's book is the most successful attempt which has been made to explain the situation, and we believe that if the Government would send a copy of the book to each manufacturer in the country, the cost would be a mere nothing compared with the effect which would be attained.

OUR BOOKSHELF.

A Little Book on Map Projection. By Mary Adams. Pp. viii + 108. (London: George Philip and Son, Ltd., 1914.) Price 2*s.* net.

IT is very satisfactory to find that at the present time care is being taken that the principles of map projection are being studied as soon as the use of maps is seriously undertaken. At one time this part of their subject was much neglected by geographers, and left to those whose mathematical aptitude was especially developed. In this book Miss Adams aims at meeting the needs of the secondary and the higher elementary schools; and in clear and simple language sets forth the difficulties of an adequate cartographical representation of the earth's surface. Simple explanations are given of the principal types of projection, and then the distortion of the original spheroidal surface when it is represented on a plane surface is explained, and the compromises which have to be adopted are set forth. After this preliminary exposition, into which no mathematics enter, there follows a more detailed discussion of the principal zenithal, conical, and cylindrical projections, as well as certain special projections. These are illustrated by diagrams, and the explanation which is given of each should enable anyone to obtain a clear idea of the essential character of each kind.

A short appendix gives a more mathematical account of Mercator's, the Zenithal, and Mollweide's projection, but with this exception no demand of any but elementary mathematical knowledge is made upon the reader.

A short bibliography, which might be usefully extended by the inclusion of some well-known German and Italian works, shows the student where he may find a more advanced treatment of the subject. The book is carefully written and well adapted to those for whom it is intended, and, while it cannot give them that complete knowledge of the subject which mathematical treatment alone can supply, it will pave the way to an intelligent appreciation which is of the utmost value to all who use maps.

Chemical Engineering: Notes on Grinding, Sifting, Separating and Transporting Solids. By J. W. Hinchley. Pp. viii + 103. (London: J. and A. Churchill, 1914.) Price 2*s.* 6*d.* net.

IN this series of articles, reprinted with some additions from the *Chemical World*, Mr. Hinchley provides, for the use of students intending to take up chemical engineering, a concise and practical outline of a subject of wide scope. The articles are illustrated with seventy sketches and diagrams, and their thoroughly practical character will be much appreciated by students of this branch of technology.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Fizeau's Experiment and the Principle of Relativity.

IT is well known that the principle of relativity gives for the velocity of light in a moving medium the expression

$$\frac{c}{\mu} + kv, \text{ where } k = \left(1 - \frac{1}{\mu^2} - \frac{\lambda}{\mu}\frac{\delta\mu}{\delta\lambda}\right)$$

where v is the velocity of the medium, and c/μ is the velocity when at rest. The repetition of Fizeau's experiment by Michelson and Morley gave for water the value $0{\cdot}434 \pm 0{\cdot}02$ for the coefficient k, whereas the value of the theoretical coefficient, taking the known values of μ and λ for sodium light, is $0{\cdot}451$, which is well within the limits of the possible error.

The experiments of Gutton (*Journ. de Phys.*, ii., p. 196, 1912) show clearly that in the case of a very dispersive medium like carbon disulphide the velocity of propagation of nearly homogeneous light is the group velocity, and not that of an absolutely monochromatic train of waves. If this is universally true, as Lord Rayleigh and Gouy have predicted, then in the expression for the convection-coefficient k, the symbol μ must stand for the ratio of the velocity of light in free space to the group velocity. If we call the ordinary coefficient of refraction μ_0, we have

$$\mu = \mu_0\left(1 - \frac{\lambda}{\mu_0}\frac{\delta\mu_0}{\delta\lambda}\right);$$

neglecting the square of $\frac{\lambda}{\mu_0}\frac{\delta\mu_0}{\delta\lambda}$ (*i.e.* of $0{\cdot}014$) and terms of the same order, we have

$$k = 1 - \frac{1}{\mu_0^2} - \frac{\lambda}{\mu_0}\frac{\delta\mu_0}{\delta\lambda} - \frac{2\lambda}{\mu_0^3}\frac{\delta\mu_0}{\delta\lambda} + \lambda\frac{\delta}{\delta\lambda}\left(\frac{\lambda}{\mu_0}\frac{\delta\mu_0}{\delta\lambda}\right)$$

If we take the dispersion-formula of Ketteler and calculate the values of the two last terms in this