REVIEWS

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commercial machine and can be arranged for rope drive just like an engine. Nevertheless, it is often necessary to put new private power plant into an old mill which is not compactly arranged, or to provide power for a group of two or more mills, and in such cases the installation of a turbo-electric drive is a sound proposition.

The fifth method of driving—case E in Mr. Williamson's comparison—is like the case D which we have considered in detail, except that individual drive is substituted for group drive. The arguments used above for case D apply equally to case E, and the subject of individual versus group driving is a separate one and will not be dealt with here.

It should be noted that while speaking in general terms we have had specially in view the driving of large compact spinning mills. The efficiency figure assumed in the comparisons made give a total friction loss between the engine flywheel and the textile machine of only 16 per cent. This is far below the average

for textile factories generally, and, naturally, the higher the friction loss with engine drive, the greater is the possibility of saving power by means of electrical drive. This saving of power by the reduction of friction load makes the advantages of electrical driving overwhelming in some mills, but it has not been taken into account in our comparisons, as ideal conditions were assumed.

In conclusion, it may be observed that these general arguments have only a distant bearing on any individual case, and each concrete mill-driving problem must be considered individually with reference to the actual conditions which affect the situation; there are mills so circumstanced to-day that it pays to drive direct from a steam engine; on the other hand, there is a very large number of mills at present engine driven where it would pay to scrap the engine and drive electrically, and the number of mills in this category is rapidly and surely increasing with time and progress.—V. MALLALIEU (Manchester, 19/5/19.)

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COLLOID CHEMISTRY: SECOND REPORT. His Majesty's Stationery Office; 1s. 6d. net.

THE Second Report on Colloid Chemistry and its General and Industrial Applications, issued by the Department of Scientific and Industrial Research (His Majesty's Stationery Office, 1s. 6d. net), is the outcome of work during 1918 of a committee under the Chemical Section of the British Association. The First Report, for 1917, was published by the British Association, but the Research Department has accepted the undertaking of publication of the Second Report, as the British Association found itself unable to meet the enhanced cost.

All workers on Colloids will welcome the publication of this report, both for its record of facts and the wealth of references to original papers which it contains. On the critical side, it is less satisfactory, as some of the writers of the sections are satisfied to record the facts without examining the good or bad conditions under which they were obtained or their relationship to well-established laws.

Readers of this *Journal* will be interested chiefly in the sections dealing with applications to the textile industry, though they will find much interesting reading in Dr. Russell's report on the part played by colloids in agriculture; in the section on sewage purification by Dr. Arden; in the report on dairy chemistry by Mr. W. Clayton, with its numerous suggestions for further research; or, in the more scientific sections, on peptisation (W. D. Bancroft), emulsions (E. Hattschek), and colloids in physiology (Prof. Bayliss). Prof. Briggs gives excellent critical accounts of the scientific basis and industrial applications of electrical

endosmose, which is becoming increasingly important in de-watering processes, the purification of china-clay, and in many other directions.

Mr. W. Harrison deals with the applications to textiles, and endeavours to cover the whole field of the silk, wool, and cotton industries. This section was probably the most difficult to write, owing to the many isolated compartments into which the treatment most naturally falls, the extensive ground to be covered, and the fact that, in most branches, practice is in advance of scientific theory. As noted in the report, real advance has, however, been made in recent years—mainly by Dr. Shorter, of Leeds—on the theory of detergent action, and by Harrison and others on the theory of dyeing. This report and its predecessors suggest two queries. The first is: Why are they entitled "Colloid Chemistry" rather than "Colloid Chemistry and Physics," or, better still, merely "Colloids"? Whole pages are read in which chemistry seems scarcely to enter and physical ideas are predominant. It may seem a small point, but the subject is in urgent need of workers both on the chemical and physical sides—scientific and industrial—and young physicists are less likely to be attracted if they regard it as a branch of chemistry. The second query is: How long is it likely to be before proper arrangements are made for the teaching of colloids in our universities? No one can read these reports without some perception of the importance of the subject, yet it is doubtful if outside the medical schools there is a single lecturer on colloids in the country, and, again excepting medicine, the number of researchers is exceedingly small. It is very desirable that the issue of these reports be continued.

—R. S. WILLOWS