

when the great body of Englishmen had as strong a sense as had their contemporary Germans of the propriety of some form of general State control over educational matters. Protector Somerset had it as strongly as Duke Christopher of Württemberg, Mulcaster as Melancthon, Milton (when at last he grappled with the political aspects of the question) as Comenius, Archbishop Sheldon as the Great Elector. But at that point the parallel stops. In Germany thenceforth the idea of education as a function of Government waxes stronger; in England it is pushed into the background, only to come seriously to the front again in the Socialist movement led by Robert Owen in the first quarter of the nineteenth century. What is the cause of this divergence? The roots of the matter lie deep in the religious and political fortunes of the two countries. But the proximate cause of the difference may perhaps be found in the fact that the idea of the autocratic State (benevolent, educational, directive) found a congenial home in the German kingdoms, but in England an unfertile soil.

The other point which strikes the reader of Dr. Paulsen's masterly little book is that Germany is apt to give over-zealous adhesion to some idea or set of ideas which may be intellectually or politically fashionable at a given period, and then at a later time to change its mood and discard its old theory with a somewhat unrestrained contempt. Both for good and for evil, German educational development is scarred with deeper rifts than the English. Our growth has been more continuous but less enthusiastic; we have been readier to blend old-fashioned things with new; we have been less often carried off our feet by some favourite idea.

Now, as we look upon German education as a whole from our different standpoint, with respect and gratitude for all that German thought, German idealism, and German laboriousness have done for us, two features stand out in it as being of cardinal importance. The first is the influence exerted upon education, even upon some parts of university education, by the bureaucratically organised State. But is it, after all, a good thing to make a youth's future prospects of professional advancement depend so closely upon his performing the prescribed tasks of a prolonged school education, which is necessarily somewhat bookish and (in spite of all Matthew Arnold's too easy assurances) examination-clouded? The other point is that a belief in the supreme value of a "circle of ideas," built up in a boy's mind by the skilful hand of a schoolmaster, is much more deep-seated in Germany than in England. Education to them, far more than to us, means a highly trained and often eloquent teacher directing from his desk the aspirations and intelligence of rows of diligent and well-disciplined youths sitting before him, each with his neat satchel of books. Let us confess our fault. We have too faint an idea of personal obligation to the organised State. We have too little conception of the power of ideas. But does not the elaborately organised educational system of Germany tend to exalt too highly the prestige of the official and

bureaucratic State? And does it not entrench in fortifications of vested interest a bookish and over-intellectualised kind of education, against the claims of which brilliant but not yet effective protest is made by Prof. Dewey in America and by Prof. Armstrong among ourselves?

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OUR BOOK SHELF.

Industrial Electrical Measuring Instruments. By Kenelm Edgcumbe. Pp. xiv+227. (London: A. Constable and Co., Ltd., 1908.) Price 8s. net.

ALTHOUGH, as the author points out in the preface, the subject of electrical measuring instruments is of great importance, there exists so far not a single work in the English language dealing comprehensively with such instruments. This book will therefore undoubtedly be welcomed by all engineers who have to deal with electrical measuring instruments, and by all who may chance to desire information as to the construction, working and maintenance of the various types of measuring instruments.

Every possible type of electrical measuring instrument, with the exception of supply meters, which has already been adequately dealt with in other books, is fully discussed from a practical point of view.

Although relays, synchronisers and lightning arresters cannot be classified as measuring instruments, they have been included, and this is certainly no disadvantage, as there is practically no information available about this class of apparatus except what is scattered in the technical papers.

The first thirty-nine pages are devoted to general principles, underlying all types of instruments, such as scales, control, pivots, springs, damping, &c., and contains much interesting information.

A good section is that dealing with resistance measurements, and a good description is given of the "Megger," one of the latest commercial instruments. The section on galvanometers is very short and contains very little information, and can in a future edition be enlarged with advantage. The various types of ammeters, voltmeters, and wattmeters are fully described, and the advantages and disadvantages compared. The section dealing with instrument transformers is specially useful, for there is little information available on this subject.

The section on recording instruments is not very complete; for instance, there is practically no description of any recording ammeter or voltmeter such as is used for traction work.

The last section, dealing with Prof. Fleming's cymometer and its application, might with advantage have been left out, first because the description given is only very brief, and secondly because it is entirely out of place in a book of this kind.

The book is clearly printed, and well illustrated by workmanlike sketches. The author, whose great practical experience in electrical measuring instruments is well known, has produced a most valuable book, containing a mine of practical information.

Many of the sections might in a future edition be somewhat enlarged and others cut out altogether, but this, of course, in no way diminishes the value of the book. It contains no misleading statements, is free from complicated mathematical formulæ, and can therefore be thoroughly recommended to all engineers who have to deal with this class of instruments. The subject of photometry is not touched upon; the author hopes to deal with this in another work.

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