

after the revocation of the Edict of Nantes. His father was a Shropshire clergyman and he himself returned there in mid-life in the same capacity. But he had added many things to the equipment of the average parson, for he was an enthusiastic and accomplished draughtsman, an ardent geologist, and a musician capable of training and conducting the village band and choral society. Evidently Christ's Hospital had done well by him, even in the rough and barbarous days which he describes. It is so evident in all he says that a spice of roughness is no drawback to a sound and even enjoyable education. The book is a welcome addition to the large literature which has arisen from Blue Coat surroundings. Every 'old boy' would wish to have it, and to the general student of education it has more than local interest. One striking feature which must have reached its highest point here is the list of special and esoteric names applied to the various boys, objects, and actions familiar in the school. In this vocabulary we go from the 'Grecians' at the top, down to the 'Trades' of each ward who brought up the food from the kitchens and even the 'Cakes' left on the boy's person by the cheerfully accepted canings. Can one have a really intimate and effective home or school without some such affectionate jargon?

F. S. M.

Penrose's Annual: the Year's Progress in the Graphic Arts. Vol. 33, 1931. Edited by William Gamble. Pp. xix+172+72+98 plates. (London: Percy Lund, Humphries and Co., Ltd., 1930.) 8s. net.

This ponderous volume is considerably thicker than any of its predecessors, presumably because of the larger number of examples of work that it contains. Of these examples, some, so far as one can judge, are very fine; but of course when the merit of a piece of work consists in copying an original as nearly as possible, one cannot really judge of it in the absence of the original.

We are very glad to see that Mr. A. J. Newton sets the good example of illustrating the results of the Peridak process by a graduated device, not a picture. Here we get a full range of tones with a patch of sensible size for each. This is a process of definitely controlling the reduction by means of Farmer's solution, in such a manner that dots that are completely joined may be reduced to mere pin points without losing their opacity. The screen negative is etched in nine stages. This tendency to complexity of method is also manifest in colour work. Theoretically, three colours are sufficient. Then for some time we got accustomed to four. In this volume there are specimens of pictures in up to eight colours, and from the nature of the examples we cannot see the advantage of running from the simplicity of three, or at most four, up to the complexity so nearly rivalling the colour work done before the three-colour era.

Mr. C. T. Jacobi has this year selected the Cambridge University Press for his historical article. He traces its development from A.D. 1521, when John Siberch printed the first Cambridge book. Dr. A. Ruppel, the Director of the

Gutenberg Museum in Mayence on the Rhine, contributes an illustrated article on the Museum, past, present, and future. The editor gives his usual review and notes, summarising the progress of the graphic arts during the third of a century.

Grundlagen der praktischen Optik: Analyse und Synthese optischer Systeme. Von Dr. M. Berek. Pp. vii+152. (Berlin und Leipzig: Walter de Gruyter und Co., 1930.) 13 gold marks.

A NUMBER of circumstances have combined to bring the importance of applied optics to the fore in recent years. Unfortunately, research into the range of validity of some of the more important theorems has tended to lag behind the immediate needs of manufacturers, while, conversely, the practical optician has failed to appreciate the help which the applied mathematician—with workshop experience—can provide.

Prof. Berek is in a position to render great service in this connexion, in that he combines a first-hand knowledge of industrial conditions (and limitations) with an academic outlook upon physical optics. His book contains a number of very elegant theorems relating to image formation and synthetic optical systems, which should prove of considerable value in the design of microscopes and ophthalmic instruments. The latter have already benefited greatly from the classical work of Prof. von Rohr: it is gratifying to find the subject so much alive.

This is not a book that can be honestly recommended to junior students; its place is more in the post-graduate laboratory of technical colleges and in the research department of firms concerned with optical apparatus of high precision.

F. I. G. R.

Physik: ein Lehrbuch für Studierende an den Universitäten und technischen Hochschulen. Von Prof. Wilhelm H. Westphal. Zweite Auflage. Pp. xvi+571. (Berlin: Julius Springer, 1930.) 19·80 gold marks.

IN the second edition of his book, Prof. Westphal has retained the desirable features which were referred to in noticing the first edition (*NATURE*, July 6, 1929, p. 18). In particular, the first chapter is excellent, with its introduction to causality and the essence of hypothesis. This is clearly the way in which a text-book of physics should begin, and yet such an opening is all too rare.

As regards the rest, compared with the general high level, the portion dealing with thermodynamics seems a little uninspired. Would it not be possible to cut adrift from convention and attack entropy boldly from the axiomatic point of view of Carathéodory? Fear of the examiner is probably less acute in the German university than elsewhere. Again (p. 519), Debye's T^3 law is given without comment: Schaefer's reasons for doubting its validity at the lowest temperatures—where it is usually taken for granted—should surely have been mentioned.

The author writes with unusual clarity: many English-speaking students would do well to improve their physics and their German by using this book.