

work of small squares in the focus of the eyepiece was another favourite device which might have answered very well if the object to be measured exactly fitted the side of the square. Picard seems to have first imagined the use of the screw to move two plates of metal, similar to the slit of a spectroscope, but to measure the distance, if we correctly understand the description, he had to detach the micrometer from the telescope and place it under an ordinary microscope. Hooke supplied the movable wires as an improvement to Gascoigne's micrometer, and Auzout introduced the divided head. Römer gave us the spring to take out the "loss" of the screw, Traughton added the position circle, and so the tale goes on, showing the variety of processes and the slowness of growth necessary to ensure the perfected form that receives general acceptance.

The processes followed in dividing the limbs of graduated instruments is another subject which the author's practical knowledge and great experience can render peculiarly interesting, but we can say no more than that in this treatise, with its admirable illustrations, will be found a valuable collection of facts from which one can trace that growth of mechanical skill and improved technique, which have ministered so materially to the progress of astronomical science.

NATURE AND NURTURE OF THE CHILD.

An Introduction to Child-study. By W. B. Drummond, M.B., C.M. Pp. iii+348. (London: Edward Arnold, 1907.) Price 6s. net.

The Child's Mind: its Growth and Training. By W. E. Urwick, M.A. Pp. xi+269. (London: Edward Arnold, 1907.) Price 4s. 6d. net.

MR. DRUMMOND, who is already well known as the author of a useful primer on the nature and nurture of the young child, has written a more ambitious book, which "aims at supplying a fairly comprehensive introduction to child-study." His work, therefore, necessarily covers a wide field, ranging from facts of growth, defects of the special senses, and school hygiene, by way of the instincts, habits and interests of children, to their forms of expression and their moral and religious characteristics. On all these he writes interesting chapters prefaced by sections dealing with methods of investigation and other introductory topics.

On p. 87 the student is wisely warned against the over-enthusiasm exhibited by "a number of workers especially in America," some of whom "start with no definite object in view and not unnaturally arrive nowhere." It would doubtless be unfair to suggest that this severe criticism applies not inaptly to the child-study movement as a whole. Nevertheless, on turning the last page of this book one is tempted to ask whether it is possible to secure "the chief end of child-study," which is, we are told, "not only to collect facts about children," but also "to formulate them in such a way as to make them available for science and for the use of those who need them for application to practical problems," so long as even

such able exponents as Mr. Drummond give us little more than a mass of materials of widely different values, not always submitted to adequate criticism, and illuminated from no general point of view. This complaint should, however, be qualified by recognition that the author can scarcely fail to encourage sympathetic observation of children—a result with which he would, apparently, be satisfied.

By contrast with Mr. Drummond's book, the systematic unity of treatment that follows from adherence to a clearly conceived point of view is the most prominent characteristic of Mr. Urwick's. The author of "The Child's Mind" sees clearly that:—

"It is not sufficient for the purpose of education merely to collect and state facts drawn from these sciences [Biology, Physiology and Psychology] which seem to be relevant. . . . The rays of light coming from the different sciences must be focussed, passed, as it were, through a common lens, in order that the light thrown may be cumulative and concentrated rather than sporadic."

It may be said at once that he has performed the task thus indicated in such a way as to make his modestly announced "study" one of the most useful pedagogical treatises of recent years. He has given what is much more helpful than the best "psychology for teachers"—a consistent interpretation of the educative process as a whole as it presents itself under the more or less conventional conditions which actually determine it.

Mr. Urwick's treatment is based upon the modern concept of connotation. Human behaviour can be analysed largely into connotative processes which set towards or away from objects of positive or negative "immediate value." In relation to these immediate values other objects of perception or thought may have "final value." Education consists in the (indirect) teaching of a certain range of immediate values and the (direct) teaching of final values with reference to these. Thus immediate and final value replace in Mr. Urwick's scheme the Herbartian notion of interest. His treatment is in a sense complementary to the older doctrine, of which he gives fragmentary but interesting criticisms. The student will find it a valuable exercise to study "The Child's Mind" together with a representative exposition of the Herbartian psychology such as that of Prof. Adams.

T. P. N.

OUR BOOK SHELF.

The Essentials of Cytology. An Introduction to the Study of Living Matter. With a Chapter on Cytological Methods. By Charles Edward Walker. Pp. viii+139. (London: Archibald Constable and Co., Ltd., 1907.) Price 7s. 6d. net.

THE need for an elementary text-book on cytology has been felt for some years, and Mr. Walker has sought to meet it in the volume before us. There is much in the book that is good. The details of nuclear division in the higher forms are clearly presented, and the student is enabled to gain a clear idea of the process by means of the admirable and ingenious stereoscopic photographs which accompany the volume.