

archenteron communicates with the segmentation cavity in all Anamnia, which is hardly the case; on the other hand, it seems to get over the difficulty of deriving the conditions found in the Amniotes from those observed in lower forms.

We imagine, however, that few morphologists will accept so imaginative an hypothesis. It is not difficult to explain the differences between these two great divisions of the Vertebrates more logically by reference to the Gymnophiona. But putting that aside, it is open to grave doubt whether it is possible to attach any phylogenetic significance, any morphological value in the determination of homologies, to the germ-layers of the Vertebrates, or, indeed, of any other group. Their significance is rather physiological, and can only be analysed by the ordinary physiological methods of observation and experiment.

PSYCHOLOGICAL STUDIES.

Harvard Psychological Studies. Vol. i. Edited by Hugo Münsterberg. Pp. 654. (New York: The Macmillan Company, 1903.)

THIS, the fourth volume of monograph supplements to the *Psychological Review*, consists of sixteen papers by the students of the Harvard School of Psychology, fifteen of which represent the principal results of the work done in the laboratory in the last few years. Most of the papers show, properly enough, the influence of Prof. Münsterberg's vigorous and original mind, and it is no doubt owing in part to his teaching and direction that each of the researches deals with a well-defined problem by appropriate and original methods. But the individual workers have preserved their independence, and the standard of treatment and achievement reached is in all cases a high one.

Of six studies in perception, Mr. Holt's explanation of the bands seen on passing a rod across the surface of a rapidly rotating disc bearing coloured, or black and white, sectors, is an admirable example of neat and convincing experiment. Of three studies in memory, those of Messrs. Meakin and Moore are interesting as achieving valuable results by systematically conducted introspective observation of the primary memory-image. Even the "purest" and most old-fashioned psychologist could hardly raise objection to their procedure. Their results suggest that much valuable knowledge is to be gained by those who have the patience to follow up this line of research, but the absence of all objective control of the results makes the method a dangerous one, unless subjects innocent of psychological theory can be found to carry out the introspective observations.

Of four studies in æsthetic processes, the principal are elaborate and ingenious researches on the constitution of objective rhythm-forms and on symmetry. In the case of the latter, the experimental conclusions are supported by analyses of pictorial compositions ranging from the ornamental designs of primitive people to the altar-pieces of Raphael. In two studies in animal psychology, Mr. Yerkes breaks new ground by registering accurately the reaction-times of the leg of the green frog in response to a variety of stimuli, and he shows that the frog and the crayfish are alike

capable of learning by experience, of acquiring new associations, though but slowly; he thus refutes the view that they are but unconscious automata, a view that has been based on the belief that they are devoid of such capacity.

The volume is completed by a short paper in which Prof. Münsterberg briefly restates the main conclusions reached in his "Grundzüge der Psychologie" (Leipzig, 1900). He claims that under the term psychology two fundamentally different sciences are commonly confused together; the one treats of "the inner life as objective content of consciousness, as phenomenon, the other of the inner life as subjective attitude, as purpose." The former science is descriptive and explanatory, those who pursue it are "phenomenalists"; the psychical objects with which they deal are abstractions, comparable to the physical objects dealt with by the physicist. The other science, improperly called psychology, is "voluntarism"; it is teleological and interpretative, but not explanatory, it includes the normative and historical sciences, and gives "a more direct account of man's real life than psychology can hope to give." These remarks prepare the way for a comprehensive tabular classification of all the sciences, which, whether it be found acceptable or no, is certainly novel and extremely interesting.

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OUR BOOK SHELF.

A Gloucestershire Wild Garden. By the Curator. Pp. xii+230. (London: Elliot Stock, 1903.) Price 6s. net.

GARDENING books are becoming noted for containing a small amount of gardening information largely diluted with something that has little or no relevance to horticultural pursuits. The diluting medium may be cookery or hygiene, tirades against vivisection, stale jokes, spiritualism, anything, in fact. In the present book gardening, or one phase of it, represents the slices of bread between which are inserted, sandwich-fashion, dissertations on the molecular structure of the brain and nerve centres, and discussions on the origin of thought and the nature of religious impressions.

The "Curator" is the gardener who evidently knows plants and loves them. To him appear when he is tired of work, or, at any rate, without preface or apology, a somewhat prosy "Professor," who supplies the anatomical details above mentioned, and explains them from the materialistic standpoint, and an orthodox "Padre," who is somewhat shocked at the views propounded by the professor. The Curator acts as moderator, and when discussion seems likely to become dangerous, suggests a pipe of tobacco or a cup of tea as effectual "shunters." At any rate, we pass abruptly from metaphysical subtleties either to the tea-table or to another chapter, in which we are told how to construct a "wild" garden. As if all this were not enough, a love story—a very short one—is introduced, and so the book has one quality which a garden should possess, and that is, variety.

The author tells us that he does not write for critics, but we hope he will not mind our saying that the gardening part of his book is on a higher level than that to which we are accustomed in similar books, and as for the remainder, we should prefer in this Journal not to express any opinion, but to leave the reader to form his own conclusions.