provision which is made by school systems for bathing. The first aim is for physical exercise and health; when this is the aim a swimming tank is provided.* * * The second aim is to produce cleanliness and to teach cleanliness. The most satisfactory means to attain the second aim seems to be that of the shower-bath. In some schools a bath-tub is employed, but this cannot be used as economically in regard to time as the shower-bath; it must also be cleaned after each using. It will be understood, of course, that dressing rooms are necessary in connection with the baths. * * * The testimony of those who, under the conditions above mentioned, have instituted school baths is strong with reference to the physical and moral results arising therefrom. * * *

The writer is strongly in favor of swimming tanks in all high schools; such baths, after an ordinary cleansing shower bath, apart from bringing into play every muscle of the body, exert a general tonic effect and could be thrown open in the afternoons and evenings to adults, and thus subserve the purpose of public baths, of which there is a lamentable lack.

The chapter on eyesight and hearing is especially strong and suggestive of good results. The author, after referring to proper and sufficient lighting of the school room, points to the interesting investigations of Iaval, Cattell and Sanford, how vision may be impaired by texts printed in too small letters, the alterations needed in the forms of letters, the proper size of type for school books, color and surface of the paper for school books, the size of writing on the blackboard, the objection to the use of slates, color of writing ink, postures, use of fine maps, duty of parents in preventing children at home from reading excessively at night, or in the waning light, or sewing with black thread on black cloth with defective illumination.

The author's views on defective hearing are also extremely sound when he says, "if we are to educate children, it is supremely wise to know as many of their physical defects as possible, and especially is this true as regards defects of the two most important avenues of sense, the eye and the ear; for only by means of this knowledge can the teacher work intelligently and avoid unnecessary strain on the part of the pupil and waste of effort on his own part. Careful investigations point to the broad fact that about 20 per cent. of school children possess some defect of hearing. It will be seen that the child of average ability who has some undetected defect of hearing will frequently be done an injustice and rated as dull or inattentive, not through any fault of his own, but because of a lack of knowledge on the part of the teacher of the true cause."

These abstracts sufficiently indicate the thoroughness which characterizes this most useful book.

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Manual of the Flora of the Northern States and Canada. By Nathaniel Lord Britton, Ph.D., Director-in-Chief of the New York Botanical Garden; Emeritus Professor of Botany in Columbia University; Vice-President of the New York Academy of Sciences. New York, Henry Holt and Company. 1901. Duodecimo. Pp. x + 1080.

The appearance of a new manual of botany is an event of no small moment when it comes from the hand of one recognized as an authority in systematic botany. The 'Illustrated Flora of the Northern United States, Canada, and the British Possessions,' by Dr. Britton and Judge Brown, in 1896–7–8, marked an epoch in North American botany, and at once created an imperative demand for a handy field manual in the form of an abridgment of the large work. It is to meet this demand that the work before us is intended. In its preparation Dr. Britton has availed himself of the descriptions in the 'Illustrated Flora,' which are transcribed with little or no modification excepting the necessary one of changing English to metric measurements. Many species not described in the 'Illustrated Flora' are added, and not a few genera, bringing the total number of species to about 4,500 as against 4,162 in the original work. When we remember that the latest edition of Gray's 'Manual' contained descriptions of 3,298 species, and Coulter's 'Manual,' 1,881 species, it is evident that the utmost brevity has been imperative. Abbreviations are freely

used, although not to the extent so familiar in similar German manuals. Practically all synonyms are omitted, and this, while inconvenient for some users of the book, is no doubt the better policy in a compact manual. In this the author follows the wise example of Gray's 'Manual.' Synonymy, with all its confusing difficulties, need not be brought to the beginner's notice, and for the older botanist, anything short of full citations (impossible in such a manual) is of little or no use.

Students will be interested in noticing that 'Order' and 'Family' are not identical groups, but that they stand in their proper relation in this book, as in zoological manuals. The full citation of authorities for species, including double citation where necessary, and the citation of the author of each family name, are welcome novelties in an American botanical manual. As to the nomenclature used, the statement is made in the preface that "the principles adopted by the botanists of the American Association for the Advancement of Science at a meeting held in Rochester, N. Y., in 1892, and in Madison, Wis., in 1893, supplementary to the Code of Nomenclature adopted by the International Congress of Botanists held in Paris, France, in 1867, have been followed." Accordingly, we have here a manual in which the much-discussed 'Rochester Rules' are in force, and from this time forward young botanists will be taught this nomenclature from the first. There will henceforth grow up a generation of botanists for whom the names here given are orthodox.

This book must at once find its way into the schools and colleges, to which it may be commended for the students in systematic botany.

It remains to be said that the publisher has met and successfully solved the difficult task of bringing so large an amount of matter within the compass of a book not too large for easy carrying into the field. It might easily have been made still smaller and lighter by the use of still thinner paper, and a little closer trimming of the margins. As compared with the pocket edition of Gray's 'Manual' this is a much larger and heavier book; if printed on the same paper and trimmed as closely, this book would weigh but twenty ounces, instead of thirty as it does now. We suggest that in future editions the printer and binder try to make some improvement in this respect.

CHARLES E. BESSEY.

SCIENTIFIC JOURNALS AND ARTICLES.

The American Naturalist for October contains the third and concluding part of W. M. Wheeler's 'Compound and Mixed Nests of American Ants,' the three forming an excellent compendium of our knowledge on the subject. Bashford Dean presents some interesting 'Notes on Living Nautilus' and Charles C. Adams has an article on 'Base-leveling and its Faunal Significance,' with illustrations taken from the topography and distribution of mollusks in the southeastern United States. The balance of the number is taken up with numerous reviews of scientific literature.

The Journal of Comparative Neurology for October. 'The Cranial Nerves and Cutaneous Sense Organs of the North American Siluroid Fishes,' by C. Judson Herrick. This is a detailed exposition of the components of the cranial nerves of the catfish and of the structure and innervation of the cutaneous sense organs. Of the latter there are four types, three classed as neuromasts (Merkel's *Nervenhügel*) and one as terminal buds (*Endknospen*), the former innervated by lateralis nerves, the latter by communis. 'The Psychological Theory of Organic Evolution,' by H. Heath Bawden, is an attempt to put some meaning into the term mental evolution without falling into the error of talking about unconscious mental states. Natural selection may in some instances be a survival of the fittest among accidental variations, but in many cases natural selection takes place in and through the conscious adaptation of means to ends. The condition of consciousness is organic tension. The evolution of consciousness has followed the path of critical stress in adaptation of organic forms. Hence the criterion for the presence of consciousness is not simply adaptation of means to ends, but adaptation under conditions of organic tension, *i. e.*, the ability to vary the use of means in the attainment of an end.

The Popular Science Monthly for November has for frontispiece a portrait of Charles Darwin