

to this species. The more important are the minute pair of median incisors having a rounded enameled crown, seldom showing any wear, and the very heavy and outwardly flexed angle of the lower jaw. A lower jaw from the Protoceras beds, which Professor Osborn figured,⁴ suggests this very heavy angle, and it would be interesting should we be able to trace the present species to *Aceratherium mitis*.

MEASUREMENTS.

Greatest length of skull.....	350
Length from occipital condyle to and including P ²	307
Length from occipital condyle to M ³	150
Greatest transverse diameter of skull.....	215
Greatest transverse diameter of brain case..	107
Greatest transverse diameter of frontals....	140
Transverse diameter of nasals back of horn cores	65
Transverse diameter of nasals at the horn cores	70
Transverse diameter of palate at M ³	55
Vertical diameter of the orbit.....	30
Antero-posterior diameter of premolars two, three and four.....	68
Antero-posterior diameter of the molar series	90
Antero-posterior diameter of P ²	22
Transverse diameter of P ²	23
Antero-posterior diameter of P ⁴	28
Transverse diameter of P ⁴	29
Antero-posterior diameter of M ¹	34
Transverse diameter of M ¹	32
Antero-posterior diameter of M ³	26
Transverse diameter of M ³	32

O. A. PETERSON.

CARNEGIE MUSEUM,
August 15, 1906.

BOTANICAL NOTES.

SOME RECENT BOTANICAL BOOKS.

SEVERAL months ago there came from the hand of Professor Coulter another book for the use of pupils in the secondary schools. That it presents the subject with accuracy and good judgment goes without saying, for when a master in a subject writes a text-book this fact alone is a guarantee of its high standing. The present work, which bears the name of 'A Text-book of Botany' (Appleton),

⁴ *Memoirs A. M. N. H.*, Vol. I., p. 139, 1898.

is a new edition, or rather a rewritten form of the widely used 'Plant Studies,' which in turn was an abridgment and combination of 'Plant Relations' and 'Plant Studies.' In the preparation of the present book Professor Coulter has made use of the suggestions and criticisms of many experienced teachers, in order to more accurately adjust the presentation of the matter to the conditions found in the secondary schools. The plan of the work can be best told in the author's own words:

In the first five chapters the structure, function and relationships of the most obvious plant organs are considered. The purpose has been to use the most easily observed material to give preliminary training in observation, and some conception of the activities of plants. The following thirteen chapters present an outline of the plant kingdom in the simplest possible form to be at all adequate. In these chapters the morphological point of view necessarily dominates, but not to the exclusion of the physiological and ecological. In this presentation of the great groups, which is also an outline of classification, there have been included special accounts of forms of economic interest; not only because such forms as well as any others may illustrate groups, but chiefly because there is a growing conviction that Botany in the schools must relate pupils to their common experiences, as well as train them in science. For the same general reason the brief chapters on plant-breeding and forestry have been introduced. The four closing chapters include a very brief account of plant associations, the most inclusive view of plants. * * * It can not be repeated too often that this book will not serve its purpose unless it is used as a supplement to the teacher, to the laboratory and to field-work.

This is certainly an admirable statement of the purpose of botany in secondary instruction. The illustrations are numerous (320) and good, and the text is clearly written. It should prove most useful in the public schools.

In Margaret Slosson's 'How Ferns Grow' (Holt) we have quite a different type of book, this being intended for the general reader instead of the public school pupil, and therefore lacking the pedagogical form of presentation. The book is a popular manual of selected species of the ferns of the eastern United States, illustrated by forty-five plates

which include a larger number of figures, mostly life-size. The author's purpose has been to give especial attention to the young fern from the time its first leaves appear up to the mature plant. These stages are illustrated by numerous figures, and these are supplemented by popular descriptions. The book will be very helpful to the class of people for whom it is primarily designed, while at the same time it will be useful to the scientific botanist who will find here much exact information about young ferns that he can not find elsewhere.

Somewhat like the last is Laing and Blackwell's 'Plants of New Zealand' (Whitcombe), which is designed 'to give an account of our native plants that will be intelligible to all.' It makes no attempt to notice or describe all of the species, dealing only with the more conspicuous flowering plants, and omitting the grasses and sedges, in addition to 'certain less important orders.' The introduction of nearly sixty pages includes a general discussion of the vegetation, in which the author has packed a great deal of most interesting information, although such words as 'formation,' 'zonation,' 'succession,' 'alternation,' 'facies,' etc., are conspicuously absent. Nor do we find that much-abused and long-suffering word 'ecology,' although the book is full of what it is now the fashion to call by that name. In short, this is an entertaining and instructive account of the plants of New Zealand told by men who have sufficient mastery of the English language to be able to write with clearness and accuracy. The book reminds us of 'Minnesota Plant Life,' written by Professor MacMillan, also a master of English, though by no means wanting in ability to write most technically on occasion. There is the same careful selection of material, the clear treatment and wealth of beautiful and apt illustrations. May we not here express the hope that Messrs. Laing and Blackwell may long continue to study and write about the plants of their country, and that New Zealand botany may not have to suffer such a loss as that involved in the retirement of Professor MacMillan from active

botanical work in this country. Science can not spare such men.

A STUDY OF THE COCONUT TREE.

IN an interesting paper published in the *Philippine Journal of Science*, Dr. E. B. Copeland gives the preliminary results of some studies of the coconut tree which he has made, especially with reference to its water relations. Incidentally a good many interesting facts are brought out in the course of the discussion. Thus even on large trees the roots are only about a centimeter in diameter, and they spring in great numbers (on large trees as many as 8,000) from the convex or obconical base of the trunk, which itself may reach a depth of 50 centimeters. These slender roots may be 5 to 7 meters long, and are simple, or branched at right angles to the root axis. They are very strong and elastic, and attach themselves to the soil with such firmness that the tree is never uprooted. The stem may reach 80 centimeters in diameter, and is so elastic as rarely to be broken even in the fiercest storms, although the favorite habitat of the tree is the seashore where it receives the unbroken force of the tropical winds.

Careful studies of the leaf were made, especially with reference to its loss of water (transpiration). These show that older leaves (one year old) lose more water than young leaves which have just reached their full size. This result agrees with observations made by Bergen on the leaves of the myrtle (*Myrtus*) in Italy. Some rough estimates were made as to the total amount of water transpired by the tree annually, which show that for an average tree it is more than 10,000 liters. This is a remarkably large amount when we consider the rather limited leaf area exposed by the tree.

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DISPUTED VESUVIAN ERUPTIONS.

NINE eruptions of Vesuvius are commonly admitted to have occurred during the first twelve centuries of our era, the volcano afterwards remaining quiescent until the paroxysmal outburst of 1631. Two minor disturb-