synthetic over the older natural products, he writes:

Ich fürchte fast, es würde manchem Teilstücke der Herrlichkeit klassischen Altertums ebenso ergehen, wenn man es mit der Exaktheit einer chemischen Synthese vor unseren Augen neu erstehen lassen könnte. Von dem alten Märchenglanze würde vielleicht nicht allzuviel übrig bleiben (p. 76).

The future possibilities of protein synthesis are introduced with these words:

Sowohl für junge Menschen als auch für junge Wissenschaften gehören Ideale zu den notwendigen und gesunden Lebenselementen, da ihnen die Fähigkeit innewohnt, latente Kräfte zu mobilisieren und nützlichen Zielen dienstbar zu machen, wenn auch die Unerreichbarkeit strenge genommen zum Begriffe eines Ideales mit dazu gehört (p. 96),

whereas the older attempts are dismissed thus:

Dass wir auf diesem und auf ähnlichen Wegen zu wirklichem echten Eiweiss gelangen Könnten, ist wohl nicht viel wahrscheinlicher, als wenn jemand einen Haufen Lettern in einem Sacke durcheinander mischen, sodann auf den Tisch ausschütten und nun hoffen möchte, dass dieselben sich zu einem schönen Gedichte gruppieren würden (p. 97).

That there is no attempt to hide our ignorance in certain fields is indicated in connection with internal secretion,

ein viel missbrauchtes Schlagwort, welches im Laufe des letzten Dezenniums zu einer gewaltigen Popularität gelangt ist. Dasselbe bezieht sich auf die Funktion einiger Organe, deren physiologische Rolle und Bedeutung, ungeachtet eines grossen Aufwandes von Mühe und Arbeit, in tiefes Dunkel gehüllt ist. "Denn eben wo Begriffe fehlen, da stellt ein Wort zur rechten Zeit sich ein;"—so sprach einmal ein weiser Mann, der zwar von "inneren Sekretionen" noch nichts ahnte, dafür aber über manche andere Dinge um so besser Bescheid wusste (p. 404).

The sources of the literature are indicated in a comprehensive way and the progress of research has evidently been followed up to very recent months. There is, as a rule, no irritating wealth of details; yet the essential steps in important reactions, such as the synthesis of suprarenin, are reviewed with painstaking accuracy. A second volume on metabolism is promised soon.

The publication of the lectures was the outcome, the author tells us, of a desire

meine eigene Freude an biochemischem Suchen und Erkennen anderen, die danach Verlangen tragen, zu übermitteln und auf diesem Wege meiner Wissenschaft zu dienen.

In this Professor v. Fürth has succeeded.

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The Lower Cretaceous Deposits of Maryland. By William Bullock Clark, Arthur B. Bibbins, Edward W. Berry and Richard S. Lull. Maryland Geological Survey. 1911. Pp. 1–622, pl. I.–XCVII.

This volume, the fourth of a series of exhaustive reports dealing with the systematic geology and paleontology of Maryland, is devoted to the Lower Cretaceous and is a distinct and invaluable contribution to the history of the Atlantic coastal plain geology of which the Maryland section may be taken as the type. The first hundred pages are devoted to the coastal plain region of the state and comprise a description of its physiographic features and a briefer statement of the Cretaceous, Tertiary and Quaternary formations, followed by a more detailed account of the areal distribution, lithologic character, stratigraphic and structural relations and organic remains of the three Lower Cretaceous formations involved. These, according to the nomenclature adopted, are, in the order of their superposition, the Patuxent, the Arundel and the Patapsco formations, together comprising the Potomac group. An especially valuable part of this portion of the volume is the historical review of opinion and the bibliography, for, be it known, the geology of Maryland has been the subject of much discussion and difference of interpretation. For example, the Patuxent and Arundel formations, on the basis of their contained vertebrates, were held by Marsh to be of Jurassic age, while the abundant plant-remains argued indisputably for their Lower Cretaceous age, a conclusion to which Professor Lull, who has reexamined the vertebrate material, has also come.

The paleontology fills the remaining five sixths of the volume and comprises reports on the Molluska by Clark, the Vertebrata by Lull and the Plants by Berry. The molluscs are unimportant, consisting of only five species, all new, four of which are from the Arundel and one—a *Unio*—from the Patapsco. They are of little or no value in correlation.

The vertebrate fauna—found only in the Arundel—is much larger and consists of seven genera of dinosaurs, a crocodile, at least one turtle, and a ganoid fish. In discussing the affinities of the dinosaurs Professor Lull compares them with the Morrison of the west and the Wealden and Jurassic of Europe, concluding that "the weight of evidence would seem to place this fauna beyond the Jurassic into the beginning of Cretaceous times." As the Arundel reptiles are closely related to, if not in some cases actually identical with, those from the Morrison of Colorado, their bearing on the age of the latter is of importance.

The major portion of the volume is devoted to the elaboration of the fossil flora by Mr. Berry. As a preliminary to the correlation of the Potomac flora he devotes a chapter to the "Lower Cretaceous Floras of the World," in which is reviewed the plants of this age in Switzerland, Portugal, France, England, Belgium, Germany, Saxony, Africa, Peru, Japan, China and Spitzbergen, as well as the several approximately contemporaneous deposits in this country. Complete lists of the species occurring at each locality are given, and while no attempt has been made to revise the nomenclature or determinations, they furnish an exceeding valuable basis for correlative and stratigraphic comparisons. Following this is a chapter on the "Correlation of the Potomac Formations." In this it is shown that the Patuxent and Arundel formations on the basis of their contained floras are essentially a unit of early Cretaceous age whose affinities all lie with the floras which preceded them, while the Patapsco, which was separated by a long time interval, has its strongest relations with the floras which followed it. The conclusion is reached that the Patuxent and Arundel formations "considered as a unit represent all except possibly the earliest part of the Neocomian and all of the Barremian of standard European sections." In this country it is believed to correspond in whole or in part with the Trinity of Texas, the Lakota of the Black Hills, the Kootenai of the Rocky Mountain region and the Cretaceous portion of the Knoxville of the Pacific Coast. The Patapsco is correlated with the European Albian and with the Fuson of the Black Hills. It is chiefly remarkable for the fact that it appears to have witnessed the introduction of the dicotyledons.

Over four hundred pages and seventy-five plates are devoted to the elaboration of the flora, which, according to Mr. Berry, comprises 144 species distributed among the several groups as follows: Filicales 43, Lycopodiales 1, Equisetales 2, Cycadophyta 33, Ginkgoales 1, Coniferales 29, Angiospermæ 25, of unknown systematic position 10. The treatment throughout has been conservative and rational, and has been based on all of the original material as well as a vast amount of recently and carefully collected material, with the result that the number of recognized species has been greatly reduced. Thus, Fontaine referred 42 species of ferns to the living genus *Thysopteris*, but these have been reduced to 5 and all referred to *Onychiopsis*. The number of species of *Cladophlebis* has been much reduced, as they have in the genera *Abietites*, *Sphenolepis*, *Arthrotaxopsis*, and especially *Sequoia*. A new generic type of fern, thought possibly to be referable to the Matoniaceæ, has been established for certain fronds of medium or large size and pseudodichotomous habit. Another fern, originally referred to *Baieropsis*, is shown clearly to be a member of the Schizæaceæ.

However, most biologic interest centers in the angiosperms, since they are as old as any of which we have definite knowledge. From the original descriptions and roughly prepared figures, it appeared that they were crude and archaic as befitted their first appearance, but with newer and better material and improved methods of reproducing them, they are seen to

be highly organized and surprisingly "modern" in aspect, thus showing that our knowledge of the actual starting point for this now dominant group is still imperfect. Mention may be made of a few of the more interesting forms. A small *Sagittaria*-like leaf is described under the new generic name of *Alismaphyllum*. What appears to be a fruiting sedge is included under *Cyperacites*, while under the name of *Plantaginopsis* is figured a plantain-like leaf and fruit possibly belonging to the Xyridales, which completes the list of monocotyledons. The dicotyledons are included under *Populus*, *Populophyllum*, *Nelumbites* (a very *Nelumbo*-like leaf formerly referred to *Menispermites*), *Sapindopsis*—the most abundant and important dicotyledonous plant of the time—*Celastrophyllum*, a form-genus suggesting the Celastraceæ, *Sassafras*, quite closely approximating the living form, *Araliæphyllum* and *Ficophyllum*, form-genera recalling *Aralia* and *Ficus* respectively, and a few others that are without very clearly understood living affinities. Altogether, the elaboration of the Lower Cretaceous floras of Maryland is of a high order, and Mr. Berry is to be congratulated on the completion and publication of the work which must long remain as a model of its class.

F. H. Knowlton

Woodland Idyls. By W. S. Blatchley. Indianapolis, Ind., The Nature Publishing Co. 1912. Pp. 242.

Mr. Blatchley has again published a nature book, interesting, instructive, enjoyable. Just the kind of a book to take out on a summer vacation to impart the love of nature and her creatures and teach one the value of simple things. It is a chronicle of several vacations spent in the fields and woods, camping at night in a tent, by day fishing, watching birds and insects, and taking notes on the happenings around him. Mr. Blatchley is qualified to speak knowingly and scientifically of nature's secrets, by long years of investigation in various phases of zoology and botany. The specialist will find here many little notes on the habits of birds, fish, turtles, small mammals and insects fresh from the mind of a careful observer. Like a clear, sweet, woodland brook, there runs through all a philosophic, yet optimistic strain of adaptation of human needs to the simplicity of nature.

N. Banks

The Evolution of Animal Intelligence. By S. J. Holmes. New York, Henry Holt. 1911. Pp. iii + 296. $2.75.

Professor Holmes gives a rather popular presentation of some of the recent work in animal behavior. He does not pretend to make his treatment of the field of behavior at all complete. The subjects he treats at some length are as follows: tropisms; behavior of protozoa; instincts and their origin; pleasure, pain and the beginnings of intelligence; types of intelligence in crustaceans, mollusks, insects, lower vertebrates and mammals. The final chapter is devoted to the study of the mental life of apes and monkeys.

While most if not all of these subjects have received more skilful treatment in the hands of Jennings, Mast, Washburn, Yerkes and Thorndike, Holmes gives a readable presentation of certain phases of behavior which will be of service to students beginning the study of comparative psychology. The book's value lies in the readiness with which it lends itself to pedagogical purposes.

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Butterfly Hunting in Many Lands: Notes of a Field Naturalist. By Geo. B. Longstaff, M.A., M.D., Oxon. Longmans, Green & Co. 1912. Pp. xviii + 724, with sixteen plates, seven colored. Price, $7.00 net.

The author describes this work as "an attempt, possibly a foolish one, to put into a readable form the technical diaries of a wandering entomologist, and to entomologists alone it appeals." The reviewer is inclined to agree. After a chapter on early reminiscences, Dr. Longstaff devotes nearly five hundred pages to notes on his captures from 1903 to 1910, during which time he visited Canada, certain of the West Indies, Panama,