specimens came from, is some one hundred and twenty-five miles from the southern boundary, in the center of the state. Regarding the specimens from Beulah, Colorado, which Blackman recognized as "the same variety of *S. heros*" as those collected in Kansas, the altitude of this place (over 5,000 feet) would strongly preclude the possibility of *S. heros*, a sub-tropical form, being found there. Also, the fact that Blackman does not record any difference in the germ cells of these Colorado specimens from those collected in Kansas would prove that they were one and the same species.

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QUOTATIONS

THE ENDOWMENT OF BIOCHEMICAL RESEARCH IN ENGLAND

OUR university correspondent at Cambridge sends us the announcement of a munificent benefaction about to be made for research in biochemistry. A minimum aggregate expenditure of £165,000 is contemplated, and this sum, if necessary, will be supplemented. The scheme includes the erection of buildings on a site to be provided by the university, equipment, provision for maintenance, £25,000 for the endowment of a professorship, and £10,000 for a readership. The money comes from the residuary estate of the late Sir William Dunn, banker and merchant, and Liberal member for Paisley. The testator died in 1912, leaving a fortune valued at a million pounds, and appointing the directors of the Commercial Union Assurance Company as trustees, with some discretionary powers as to the disposal of his residual estate. There were pencil alterations in the text of the will, and it was only after a lawsuit that the trustees were able to act. They appointed an advisory committee under the chairmanship of Sir Jeremiah Colman, and many schemes were considered. Numerous and substantial gifts have been made to well-known philanthropic institutions, but the trustees reserved a large sum to provide a lasting and fitting memorial of Sir William Dunn's generosity and to carry out his expressed wishes for the alleviation of human suffering and the encouragement of education. The benefaction to Cambridge should serve both these objects. Certainly it represents one of the most munificent and complete gifts ever made to one of the older universities. Only last month we congratulated the University of Oxford on Mr. Edward Whitley's offer of £10,000 towards the endowment of a chair of biochemistry, and on a donation of £5,000 from the British Dyestuffs Corporation to the laboratory of organic chemistry. We may hope that the friends of Oxford and of scientific research will do something to equalize the good fortune that has come to Cambridge. The chemical activities of the living cell and the living tissues provide a limitless field of research. Knowledge of them is only beginning, and until the methods and results of biochemistry have been developed, the practise of medicine will remain empirical, and fashions in drugs will change as quickly as fashions in ladies' hats. The old universities have the tradition of research, and their spirit of detachment supplies an atmosphere suitable to inquiries not too closely bound to immediately utilitarian objects. We rejoice in the great opportunity given to Cambridge, and do not doubt but that she will prove worthy of it—*The London Times.*

SCIENTIFIC BOOKS

Die Stämme der Wirbelthiere. By OTHENIO ABEL. Publ. 1919 by Verein wiss. Verlegn., W. de Gruyter and Co., Berlin and Leipzig. 914 pages, 669 text figures.

It is to be regretted that there is no good comprehensive modern text-book in English dealing with vertebrate paleontology. The researches of the last twenty years have perhaps made less change in fundamental viewpoints and theories in this than in some other branches of science. But they have added enormously to the data of facts upon which it rests, and knit closer its relationships with the cognate sciences, geology on one side, zoology and comparative anatomy on the other.

Dr. Abel is professor of paleobiology at the University of Vienna, a pupil of the great Belgian scientist Louis Dollo, and a leading authority in his profession. He is the author of two earlier text-books, "Paleobiologie" and "Die vorzeitlichen Säugethiere," the first of which was reviewed in SCIENCE some years ago.

The present volume treats of the origin and evolution of the various phyla ("Stämme") of vertebrates as shown in the paleontologic record. It is concerned almost wholly with extinct forms; and thanks to this limitation the author has been able to give an unusually full treatment and discussion, especially of the reptiles and Amphibia. The illustrations, while somewhat crude artistically, are excellent for teaching purposes, and its full discussion and fair treatment of recent foreign discoveries are remarkable in a volume prepared and published under war conditions. From first to last Dr. Abel has endeavored to discuss the evidence and give reasons for the conclusions adopted, leaving the way open for difference of opinion on many doubtful problems. A certain unevenness of treatment is manifest, both in the discussion and the taxonomic arrangement, and many details of presentation and classification are open to criticism, as is inevitable in a volume of such wide scope and fundamental treatment. From errors of fact the book is singularly free.

A classified list of the orders and families accepted, with characteristic genera, serves as a preliminary conspectus. To the fishes are allotted 160 pages, partly introductory and dealing chiefly with the early and primitive types. The vast variety of modern bony fishes are treated in a very cursory manner. The Amphibia cover 110 pages, devoted mostly to the Paleozoic types and their relations to the higher vertebrates. The extinct reptiles are quite fully treated, the discussion covering some 355 pages. The most serious criticisms to be made in this section are of the splitting of the pterodactyls into two distinct orders, and the attempt to limit the term dinosaurs to one of the two great orders of gigantic land reptiles that are now understood to be included in the old usage of the name. It would be better to retain it with the old scope but in a general unsystematic sense, like "pachyderms" among the mammals. On the other hand, the discussion of important researches and discoveries among fossil reptiles and their bearing on the evolution of the vertebrates affords an excellent synthesis of recent progress in the science. Birds are a rather minor group among fossil vertebrates, and 23 pages suffice to cover all the important types in their evolution.

The treatment of the Mammalia is relatively brief, covering 167 pages, passing very briefly and uncritically over some of the orders, and hardly touching upon the Primates, but more extended with other groups, and especially authoritative in the Cetacea, upon which the author has published several very valuable researches.

While by no means endorsing all of the author's views upon problems of evolution and classification, the present reviewer does not hesitate to commend Dr. Abel's work as highly authoritative and up to date, admirably presented as to form and reliable as to fact. The treatment of the subject differs widely from that in the new edition of Zittel's "Grundzüge der Paläontologie," recently revised by Schlosser and Broili, which affords in many ways an excellent supplement for Abel's volume, especially in its more comprehensive treatment of the Mammalia.

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SPECIAL ARTICLES

AN ULTRAMICROSCOPIC STUDY OF THE TWO STAGES OF BLOOD COAGULATION[1]

SCHMIDT[2] has described carefully the process of coagulation as it may be followed with the naked eye in the cell-free plasma of a slowly-clotting mammalian blood (horse). He drew attention to the fact that the process may be

[1] From the Physiological Laboratory of the Johns Hopkins University.

[2] Schmidt, "Zur Blutlehre," Leipsig, 1893, p. 262.