The purpose of this volume, as stated in the preface, is "to bring together, in convenient form for the use of students of zoology, some of the more important details of the biology, anatomy and development of the Crocodilia." There are chapters on the biology of the Crocodilia, the skeleton, the muscles, the nervous system, the vascular system, the urogenital system, the respiratory system, the vascular system, and the development of the alligator, and a bibliography containing eighty-nine titles. The book is illustrated by sixty-two figures, about half of them original, and twenty-eight plates, all but six of which are original.

In the chapter on the biology of the Crocodilia, the classification and geographical distribution are briefly summarized, evidently from general works, brief notes on the characteristics of several forms are given, and twenty-nine pages are devoted to a discussion of the habits and economic importance of *Alligator mississippiensis,* principally as revealed in the writer's field work. The description of the muscular system is a translation of Bronn's account of the muscles of *Crocodilus,* with illustrations of the musculature of *Crocodilus* and *Alligator,* and the description of the nervous system is taken from Bronn and others. The description of the digestive, urogenital, respiratory, vascular and skeletal systems are original, as is the account of the embryological development of *Alligator mississippiensis,* the last being a reprint, with some alterations, of an earlier paper by the author published by the Smithsonian Institution.

The author has succeeded in his expressed purpose of making the book detailed, and it will at once find a place in the library of the comparative anatomist and herpetologist as a valuable reference work. In the opinion of the reviewer, the only serious adverse criticism which will probably be made by students is that the chapter upon the embryological development of the alligator is too detailed. A connected and more readable account of the embryology would be of more general value than will be the monotonous descriptions of sections which make up this chapter. It is stated in the publisher's advertisement on the jacket that the book "has an assured appeal for the layman interested in natural history," but this is doubtful, for, in addition to the detailed treatment, the terminology is technical and about seven eighths of the text consists of descriptions of the anatomy and embryology.

ALEXANDER G. RUTHVEN
MUSEUM OF ZOOLOGY,
UNIVERSITY OF MICHIGAN

PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

(NUMBER 12)

THE twelfth number of volume 1 of the *Proceedings of the National Academy of Sciences* contains the following articles:

1. *Salts, Soil-Colloids and Soils:* L. T. SHARP, College of Agriculture, University of California.

New light is thrown upon the subject of salts in relation with soil-colloids. The way is opened for extensive experiments in the physical chemistry of soils, and the principles involved will be of particular significance for the subject of the applications of alkali and of fertilizer salts.

2. *The Child and the Tribe:* ALICE C. FLETCHER, Peabody Museum, Harvard University.

The rites connected with the initiation of the child into the tribal life are described with emphasis upon their significance in Indian education and philosophy.

3. *The Correlation of Potassium and Magnesium, Sodium and Iron, in Igneous Rocks:* HENRY S. WASHINGTON, Geophysical Laboratory, Carnegie Institution of Washington.

The author's earlier suggestion that soda not uncommonly tends to vary with the iron oxides while potash shows similar relations to magnesia is greatly strengthened by a compilation of analyses of igneous rocks, numbering nearly 10,000.

4. *Theorem Concerning the Singular Points of Ordinary Linear Differential Equations:* GEORGE D. BIRKHOFF, Department of Mathematics, Harvard University.

It is shown that transformations of the independent variable have no significance over and above linear transformations of the dependent variables for the purposes of classification with respect to the notion of equivalence.

5. *A Quantitative Study of Cutaneous Analgesia Produced by Various Opium Alkaloids:* David I. Macht, N. B. Herman and Charles S. Levy, Pharmacological Laboratory, Johns Hopkins University.

By the use of exact experimental methods the order of analgesic power in the individual alkaloids from strongest to weakest is found to be: Morphin (10 mg.), papaverin (40 mg.), codein (20 mg.), narcotin (30 mg.), narcein (10 mg.), thebain (10 mg.). The combinations of alkaloids are also studied.

6. *The Surface-Tension at the Interface between Two Liquids:* William D. Harkins and E. C. Humphrey, Kent Chemical Laboratory, University of Chicago.

The substitution of experiments on the liquid-liquid interface for the ordinary method in which a liquid-air interface is used, makes it possible to compare the drop-weight results with those obtained in a capillary tube of large bore. Various advantages appear from the use of this method.

7. *Outlines of a Proposed System of Classification of the Nebulæ by Means of Their Spectra:* W. H. Wright, Lick Observatory, University of California.

The spectra are arranged according to the degree of concentration of 4686A and some of the neighboring lines. The successive nebulæ stand in very close relation to one another, yet at one end of the scale is a purely gaseous nebula, and at the other end a banded star.

8. *Some Probable Identities in Wave-Length in Nebular and Stellar Spectra:* W. H. Wright, Lick Observatory, University of California.

The evidence renders probable the presence in the nebulæ of carbon and nitrogen and fortifies the assumption of a close relationship between the nebulæ and the early type stars.

9. *Energy Transformations During Horizontal Walking:* Francis G. Benedict and Hans Murschhauser, Nutrition Laboratory, Carnegie Institution of Washington.

The metabolism found for the subject walking at moderate speed without food has an average value of ½ gram-calorie. Slow, medium, and fast walking and running are investigated for comparison.

10. *The Physiology of the New-Born Infant:* Francis G. Benedict and Fritz B. Talbot, Nutrition Laboratory, Carnegie Institution of Washington.

The results of experiments on 105 new-born infants give opportunity for suggestions as to supplemental feeding and methods of conserving energy.

11. *A Comparison of Methods for Determining the Respiratory Exchange of Man:* Thorne M. Carpenter, Nutrition Laboratory, Carnegie Institution of Washington.

The apparatus compared were the following: bed respiration calorimeter; two forms of the Benedict universal respiration apparatus; Zuntz-Geppert apparatus; Tissot apparatus; and so on.

12. *Neuro-Muscular Effects of Moderate Doses of Alcohol:* Raymond Dodge and Francis G. Benedict, Nutrition Laboratory, Carnegie Institution of Washington.

Contrary to the theory of Kraepelin, the authors find no facilitation of the motor processes, but the depression of their simplest forms in the finger and eye movements seem to be one of the most characteristic effects of alcohol.

13. *Variation and Inheritance in Abnormalities Occurring after Conjugation in Paramecium Caudatum:* Ruth J. Stocking, Zoological Laboratory, Johns Hopkins University.

In respect to the abnormalities, while some lines are constant in hereditary character, in others hereditable variations do occur within the line, so that, by selection, it is possible to break the single stock into a number of stocks differing hereditarily.

14. *The Influence of the Marginal Sense Organs on Functional Activity in Cassiopea Xamachana:* Lewis R. Cary, Department of

Biology, Princeton University.

There is no direct relationship between the extent of muscular activity and the rate of regeneration. In the absence of the influence of the sense-organs regeneration can take place normally but always at a decidedly lower rate.

15. *Heritable Variations and the Results of Selection in the Fission Rate of Stylonychia Pustulata:* AUSTIN RALPH MIDDLETON, Zoological Laboratory, Johns Hopkins University.

It is possible to give precise data as to the occurrence of heritable variations and their accumulation through selection: and this can hardly fail to have influence on the conception of the genotype as a fixed thing.

16. *Hereditary Anchylosis of the Proximal Phalangeal Joints (Symphallangism):* HARVEY CUSHING, Harvard Medical School and Peter Bent Brigham Hospital, Boston.

The character behaves as a simple Mendelian dominant with equal chance among the offspring of affected individuals that it will be or will not be inherited.

17. *The Relative Stimulating Efficiency of Spectral Colors for the Lower Organisms:* S. O. MAST, Zoological Laboratory, Johns Hopkins University.

The stimulation in all of the organisms studied depends upon the wave-length of the light, and the stimulating efficiency is very much higher in certain regions of the spectrum than in others, but the regions differ in certain organisms closely related in structure.

18. *The Mission Range, Montana:* W. M. DAVIS, Department of Geology, Harvard University.

This range seems unique in its systematic tripartite arrangement of normally and glacially sculptured forms.

19. *Definition of Limit in General Integral Analysis:* ELIAKIM HASTINGS MOORE, Department of Mathematics, University of Chicago.

The definition is noteworthy in that it involves no metric features of the range $\mathfrak{P}$ underlying the range of definition of the function $F(\sigma)$.

This number of the *Proceedings* contains also a notice of the memoir by Charles C. Adams on "The Variations and Ecological Distribution of the Snails of the Genus *Io*"; the Report of the Autumn Meeting, and the Index and Table of Contents of the complete volume, including a list of the officers and members of the academy.

We may summarize the articles in Volume 1 of the *Proceedings* as follows: Mathematics, 21; Astronomy, 31; Physics, 7; Chemistry, 21; Geology and Paleontology, including Mineralogy and Petrology, 10; Botany, 4 (see also Genetics); Zoology, 15 (see also Genetics); Genetics, 17; Physiology and Pathology, including Bacteriology, 24; Anthropology, 12; Psychology, 3; a total of 165 articles.

The division of these articles between members of the academy and non-members is 55 and 110, respectively.

The list of institutions which have contributed three or more articles is as follows: Carnegie Institution 34, divided as follows: Solar Observatory 17, Nutrition Laboratory 9, Station for Experimental Evolution 5, Marine Biology 2, Geophysical Laboratory 1; University of Chicago 20; University of California 17; Harvard University 16; Johns Hopkins University 11; Rockefeller Institute 11; University of Illinois 8; Yale University 6; Princeton University 5; Smithsonian Institution 4; U. S. National Museum 4; Stanford University 4; American Museum of Natural History 4; U. S. Geological Survey 3.

EDWIN BIDWELL WILSON

RECENT PROGRESS IN VERTEBRATE PALEONTOLOGY

THREE years ago the Paleontological Society of America published a symposium, the purpose of which was to present a review of the progress made during the preceding decade in paleontology. Since 1911 there have been published in the American Year Book brief summaries of the more important results of investigation in this field throughout successive years. The extreme brevity of these reviews has rendered them less useful to students than