salary? Would it not be better to devote the available money to paying several younger men from 25 to 35 years of age—their more productive years—to devote practically all their time to teaching and research? Fortunately for the plan, the men who are responsible for it recognize that it is an experiment and frankly advise that it be not adopted by other medical colleges until it has been tried out on Hopkins.

The fact that such a plan has been seriously proposed by laymen interested in education emphasizes the necessity of a thorough reorganization of our scheme of clinical teaching along lines to be determined and agreed on by a committee of our best clinical teachers.

I should like to add the following comment.

First, that the Council of Medical Education believes that one of the most pressing needs is that of the reorganization of our clinical departments on a more satisfactory basis.

Second, the Council of Medical Education has taken the position that this important subject of the reorganization of clinical teaching should be submitted to a committee of experts, men who are recognized as great clinical teachers and who are familiar with the problems of clinical medicine. This committee is composed of the following men: Dr. V. C. Vaughan, University of Michigan, President of the American Medical Association; Dr. Geo. Armstrong, McGill University; Dr. John Finney, Johns Hopkins University; Dr. John Clark, University of Pennsylvania; Dr. W. J. Mayo, trustee of the University of Minnesota; Dr. Geo. deSchweinitz, University of Pennsylvania; Dr. Frank Billings, Rush Medical College, University of Chicago; Dr. Harvey Cushing, Harvard University; Dr. Geo. Dock, Washington University, and Dr. Saml. Lambert, Columbia University.

The committee is at present working on this problem. The Council on Medical Education does not know as yet what the findings of this committee will be. We believe, however, that the report of this committee will be of greater value than would the report on this particular subject of a committee of university presidents, professors in the science departments of universities, professors of the laboratory branches such as embryology, chemistry or physiology in a medical school, or men who are devoting their lives to the problems of medical research, but who are not in touch with clinical medicine. Would it not be well for university presidents, university trustees and medical faculties who contemplate reorganizing their clinical departments to await the findings of this committee representing the American Medical Association? The subject was discussed February 16, 1915, at the annual conference on medical education held in Chicago and the final report will be made to the house of delegates at the June meeting of the American Medical Association.

Arthur Dean Bevan

SOIL NITRATES

To the Editor of Science: In the reviews of an article[1] by Mr. Wright and myself appearing in a monthly bulletin of the International Institute of Agriculture[2] and the *Chemical Abstracts* of the American Chemical Society,[3] the point of view supported by our paper is not fully recognized. One review refers to the malnutrition of citrus trees as resulting from the toxic effects of superabundant nitrates, and the other refers especially to the production of malnutrition from the denitrification of soil nitrates. We presented the data of our experimental studies in California in some detail in order to draw attention to what we believe to be an important phenomenon, namely, that probably identical symptoms of malnutrition result either from superabundant nitrates which we regard as one phase of the so-called "alkali" poisoning and by nitrogen starvation which may re-

[1] "Relation of Bacterial Transformations of Soil Nitrogen to Nutrition of Citrus Plants," Kellerman, K. F., and Wright, R. C. (Bureau of Plant Industry, U. S. Dept. of Agr.) in *Journal of Agricultural Research*, Vol. II., No. 2, p. 101–13, Washington, D. C., May, 1914.

[2] *Monthly Bulletin of Agricultural Intelligence and Plant Diseases*, Year V., No. 9, p. 1166, September, 1914.

[3] *Chemical Abstracts*, Vol. 8, No. 15, p. 2769, August 10, 1914.

sult either from a natural property of soil nitrogen or may be caused by denitrification of soil nitrates usually caused by improper cultural methods.

K. F. KELLERMAN

SCIENTIFIC BOOKS

Water Reptiles of the Past and Present. By SAMUEL WENDELL WILLISTON, professor of paleontology in the University of Chicago. University of Chicago Press, 1914. Pp. vii + 251, with 131 text-figures.

This interesting volume summarizes in a most authoritative manner our knowledge of the reptiles which have become adapted to aquatic life, and it also includes a chapter on the classification of reptiles, a subject upon which Professor Williston, with his forty years of special study, is abundantly fitted to speak.

In his introduction the author speaks earnestly in the defense of reptiles, which are so often of ill repute as cold, gliding, treacherous and venomous creatures shunning sunlight and always ready to poison. As a matter of fact, but few reptiles possess these evil propensities, for, aside from the venomous serpents, there are but two poisonous reptiles known, and the vast majority are not only innocent of all offense toward man, but are often useful to him. More than four thousand reptiles are living, representing, however, but four of the fifteen orders which were formerly alive. The terse definition of a reptile as a cold-blooded, backboned animal which breathes air throughout life is not surely correct, since it has been believed that certain extinct ones may have been warm-blooded.

While there are very marked distinctions of structure between the amphibians and the reptiles, there can be no doubt that the early amphibian ancestors of the modern toads, frogs and salamanders were also the ancestors of all living and extinct reptiles. This is proved by the fact that discoveries of recent years have bridged over nearly all the essential differences between the two classes so completely that many forms can not be classified unless one has their nearly complete skeletons. In the case of some of the oldest amphibia, the Stegocephalians, we know that they were water-breathers during part of their lives, because distinct impressions of their gills have been preserved, but we are not so sure that some of the more highly developed kinds were not air-breathers from the time they left the egg; if this be true, our definition of a reptile as distinct from an amphibian is rendered still less secure. We are quite certain that from some of the early extinct reptiles—probably the immediate forebears of the great dinosaurs—the class of birds arose, while another group of primitive reptiles, called the Theriodontia, and known chiefly from Africa, gave rise to the mammals.

The classification of reptiles is still a matter of much doubt and uncertainty, no two authors agreeing on the number of orders or the rank of many forms. Many strange and unclassifiable types which have come to light in North America, South Africa and Europe have thrown doubt on all previous classification schemes and have weakened our faith in all attempts to trace out the genealogies of the reptilian orders; and classification is merely genealogy. It is only the paleontologist who is competent to express opinions concerning the larger principles of classification of organisms and especially the classification of reptiles. The neozoologist, ignorant of extinct forms, can only hazard guesses and conjectures as to the relationships of the larger groups, for he has only the specialized or decadent remnants of past faunas upon which to base his opinions.

Williston's scheme of classification differs only in minor details from the more conservative of the generally accepted views, and those differences are, for the most part, the writer's own opinions, to be taken for what they are worth. It may be said decisively that no classification of the reptiles into major groups, into superfamilies or subclasses that has so far been proposed is worthy of acceptance; there is no such subclass as the Diapsida or Synapsida, for instance.

Williston recognizes and briefly diagnoses fifteen orders, of which three groups, the Proganosauria, Protorosauria and Thalattosauria, are provisionally given this rank.