

element in the evolution of specific types. His papers have been useful in putting a needed emphasis on a factor which had been insufficiently taken into account and frequently overlooked by theorists concerned with the question of specific evolution. It was appropriate, therefore, that the Carnegie Institution should give him the opportunity of presenting in one handsome volume, the ripened result of his years of reflection and study on this subject.

It is known that his studies were largely due to the interest excited by the beautiful and multiform tree-snails of the Hawaiian Islands, which, for variety in characteristics elsewhere usually taken as of specific value, are unexcelled in any equal area. It was a problem which appealed to every collector of these attractive animals. How should this almost infinite variety under almost identical conditions be accounted for? The latest investigations indicate that the chief food of the arboreal *Achatinellas* consists of fungoid mycelium which in the warm air and constant rains of the mountainous region of the islands is more or less abundantly developed on the bark of trees and shrubs upon which these landshells live; an examination by Mr. Cook of many stomachs has shown that the leaves of the shrubs or trees form no part of their diet, and that, contrary to the opinions formerly held and even not altogether discarded in the volume under review, the species of tree upon which these animals live is not of importance in their economy; the same species of shell being often found indifferently upon different species of trees over the area the former inhabits. This fact lends even greater importance to the remaining elements of the environment among which the stimulus to variation is to be sought.

It has been found that the *Achatinellas* do not lend themselves readily to experiment. Removal, even when not the slightest injury has been inflicted, usually proves fatal, from some unexplained cause. It is evident that they are extremely sensitive to even minute changes in altitude, moisture, etc., and attempts to get them to breed in the more accessible regions of the islands, where they

could be kept under continuous observation, have so far proved failures. Even the eggs seem unable to bear transportation.

For the reader who wishes to gain quickly an idea of the hypothesis maintained by Dr. Gulick, we should suggest the original papers of which a bibliography is given in the present volume, as they contain the meat of the matter in more concentrated form. In the opinion of the reviewer something has been lost by the considerable expansion of verbiage to which the statement of the hypothesis has here been subjected. But doubtless the special student of these recondite problems will find the volume none too long. In any event it should not be forgotten that while Dr. Gulick's views seem eminently probable and in the reviewer's mind go far toward accounting for many of the facts, nevertheless they are theoretical and have not yet been subjected to the crucial test of experiment, by which the proposed theory in the end must be tested. To justify final acceptance an hypothesis must not only be capable of accounting for the facts but it must be shown to be the only one by which they may be adequately explained. It is also necessary to determine how far the animals in question have arrived at that state of organic equilibrium which we recognize by the name of species. If, as has been held by some authorities, the small color-groups are really only of a temporary nature, and liable to immediate change upon subjection to modified environment, then the author's hypothesis, while losing nothing of its truth, is not a contribution to the evolution of species so much as to the physiology of color-variation. The latter may or may not be, in the group discussed, a factor of specific weight.

In any case we are grateful for the full presentation of the author's views which are of acknowledged importance in the discussion. The volume is well printed, though we could have wished that the colored plates had been of a better quality.

W. H. DALL.

Marceli Nencki Opera Omnia. Gesammelte Arbeiten von Professor M. NENCKI. Braunschweig, Friedrich Vieweg und Sohn. 1905.

Two volumes, with a portrait of the author.
Pp. 840 + 890.

The influence which an untiring worker like Professor Nencki exerts on the development of science is perpetuated in at least two ways. The enthusiasm of the investigator is transmitted to his pupils and thus continues to live; and his definite contributions to knowledge are recorded in books which do not die with the author. With the methods of publication adopted in scientific circles of the present day, the researches of an individual are usually scattered in many papers and numerous journals. What this may mean in the course of thirty years of unceasing labor in the advancement of learning is illustrated in the case of Nencki's published work, embodying his studies in organic and physiological chemistry, in bacteriology, hygiene and pharmacology, presented in many places and in several languages. Nencki's interest continued to center in the chemical aspects of various allied branches of biological and medical science, although his writings are not strictly limited by such definition. No résumé or critical discussion of the literature of urea formation and the behavior of aromatic compounds in the animal body, of the chemistry of putrefaction, of the composition of the blood pigments, of the chemistry of various digestive secretions and processes and the activity of enzymes, would be at all adequate without reference to his published contributions. Furthermore, this does not take into account Nencki's many valuable investigations in organic chemistry and hygiene.

In view of what has been stated, and especially the personal circumstances which led to such diverse channels of publication, it is timely and appropriate that the life-work of this distinguished physiological chemist should be collected and presented in a more readily available form, thus supplying what an untimely death prevented on the part of the late scientist; and it is, indeed, fortunate that two pupils so well known and closely associated with Nencki as N. Sieber and J. Zaleski have undertaken the compilation of his collected works. The two volumes which they have edited embrace all of Nencki's scientific

papers, together with abstracts of such investigations as were directly inspired by him and conducted under his supervision. A detailed reference to the papers would interest the specialist alone; but the array of contributions appearing in uninterrupted succession from 1869 to 1901 is an impressive monument to industry. A brief biographical sketch of the author is included in the volumes, which are of quite unusual typographical excellence.

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Manual of Chemical Analysis as Applied to the Assay of Fuels, Ores, Metals, Alloys, Salts and other Mineral Products. By EUGÈNE PROST, D.Sc., of the University of Liège. Translated by J. CRUICKSHANK SMITH, B.Sc., F.C.S. Large 8vo. Pp. 300. Price \$4.50. New York, D. Van Nostrand Company. 1905.

The work comprises a short introduction on the 'preparation of samples for analysis,' nearly two hundred pages on the analysis of fuels, waters and various native and artificial chemical compounds, and one hundred pages on the analysis of metals and alloys. According to the author's preface, it is intended as a manual for the industrial chemist.

Viewing the book in the light of its intended usefulness, our verdict upon it is that it is as nearly superfluous a work as could be written. The plan is fragmentary, many important analyses are omitted; the directions are poorly expressed, in most cases insufficient and in many inaccurate; obsolete methods are mixed in with more modern ones without criticism or discrimination; there is scarcely to be found a single reference to any other works on analysis or journals of any kind, to supplement the fragmentary information given; the translator was evidently as little fitted for his task as the author, as is evident from poorly translated phrases which betray an ignorance of English chemical expressions and especially of metallurgical terms; the paper is wretchedly poor, the bind-