sense of the original. A few illustrations of errors which mar the two English volumes may be cited: (Vol. I., p. 3) "the fats and proteins are partly vegetable, partly mineral"; (p. 5) "the questions, the solution of which follow the energetic work of numerous laboratory workers, are really at present more numerous than the discoveries and results obtained";[1] (p. 126) "im Stoffwechsel fast unangreifbar" is rendered as "almost beyond assimilation"; (p. 178) for "genau" we find "minutely"; (p. 403) for "reichlich Getrank zuzuführen" we get "water should be exhibited freely"; (p. 408) for "Kot" we get "motion"; (Vol. II., p. 1) "die Fragen des Chlorumsatzes und der Acetonuria" is transformed into "the problem of the Chlorine changes in acetonuria"; (p. 62) in overfeeding "it is a matter of indifference whether the excess takes the form of albumen or of some oxidizable substance free from nitrogen"; (p. 105) "the nitrogen output during starvation usually exceeds the intake by a small amount.

The German edition was quite up to date when it went through the press (1904–5). A cursory glance at the Anglo-American edition gives the impression that it has carried the review of the literature up to the date of issue. To be sure, some additional data have been incorporated, but much recent literature, especially in the field of normal metabolism, has been omitted.

The translators have cut out a considerable number of references to original literature given in the German edition.

Otto Folin

Plant Physiology and Ecology. By Frederic Edward Clements, Ph.D., Professor of Botany in the University of Minnesota. With 125 illustrations. Pp. xvi + 315. 8vo. New York, Henry Holt and Company. 1907.

This book, the result of more than fifteen years of ecological work on the part of its author, constitutes a notable addition to the literature of botany in America. In 1897 the first edition of Pound and Clements's "Phytogeography of Nebraska" was published, and in it we find the germs of the book now before us. Three years later the second edition appeared with considerable emendations and corrections, and this was followed by various papers published in magazines, transactions of societies and university "studies," culminating in Clements's "Research Methods in Ecology" in 1905, a technical handbook for the advanced student and investigator of ecology. The book in hand is based upon that work, and is, in fact, a less technical presentation of the same matter, adapted to the needs and preparation of college and university students.

The author considers physiology and ecology as essentially the same, hence the treatment is in accord with this view. The author does not in any place give the plant an ecological consideration as distinct from one which is physiological. It makes no difference whether the plant is studied in the laboratory, or in its field or forest habitat, in any case the investigation is essentially the same, and we are no longer to call the first physiology and the second ecology.

The book is broken up into fifteen chapters, of which the first is a somewhat philosophical discussion of stimulus and response. And here we get the author's definition of plant physiology in this paragraph (page 1): "Physiology was originally understood to be an inquiry into the origin and nature of plants. This is the view that pervades the following pages, and in accordance with this the subject-matter of ecology is merged with that of physiology." The nature of stimuli and the nature of response are discussed—concisely and precisely—and adjustment and adaptation are defined and delimited. Then follow chapters on the water of the habitat, adjustment to water (including absorption, transport and transpiration), adjustment to light, adjustment to temperature, adjustment to gravity, contact and shock, adaptation to water, and adaptation to light. In these chapters, along with much discussion of the problems involved, the au-

[1] This sentence purports to be a translation of the German sentence of Magnus-Levy's quoted above.

thor introduces fifty-seven practical tests for their experimental demonstration. Some of these experiments are familiar to every student of plant physiology, while others are new, and in many cases quite novel. Some of them are to be performed in the laboratory, while others take the student out into the fields and forests.

The ninth chapter, on the origin of new forms, is again a philosophical presentation, including a summary discussion of the law of evolution, stability and plasticity, constant and inconstant forms, origin by adaptation, origin by variation, origin by mutation, natural selection, isolation, polygenesis, etc. Several instructive pages are given to Darwin and his predecessors and followers.

The remaining chapters include methods of studying vegetation, the plant formation, aggregation and migration, competition and ecesis, invasion and succession, alternation and succession. Even in these chapters some experimental work is suggested, so that the student will not depend wholly upon observation and camera-pictures for his conclusions! It is safe to say that the student who learns his ecology in the way it is presented in this book will not do as much guessing at his facts, and drawing of inferences from landscape photographs, as has been the habit of some of the "ecologists" of the immediate past.

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SCIENTIFIC JOURNALS AND ARTICLES

The Journal of Comparative Neurology and Psychology for September contains two articles on animal behavior. Dr. C. H. Turner writes on "The Homing of Ants: An Experimental Study of Ant Behavior," concluding from an extensive series of field and laboratory experiments that ants find their way to and from the nest neither by tropisms nor by a homing instinct, but that they learn their way by experience. The elements which enter into this experience were subjected to experimental analysis. The second paper is by Dr. E. H. Harper, on "The Behavior of the Phantom Larvæ of *Corethra plumicornis* Fabricius." These larvæ have a very characteristic mode of locomotion in the water. They conform neither to the conventional mode of orientation laid down in the tropism scheme nor to the trial and error type of reaction, but rather to a unique type of reaction system of the larva.

THE last number of *Symons's Meteorological Magazine* contains the following note: "The five hundredth number of *Symons's Meteorological Magazine* is now before our readers, a fact of no little interest when the smallness of the public to which such a journal appeals is taken into account. When Mr. Symons produced No. 1 in February, 1866, he had already issued a "monthly rain circular," as a supplement to "British Rainfall" for several years, so that a greater antiquity might plausibly be claimed for the magazine than the numeral implies. The magazine, though small, has grown, and is not, we trust, incapable of further growth without departing from the original lines on which it was planned. As an independent organ of opinion in meteorological matters, it has, we believe, been of use in the past, and we hope that this usefulness will continue. We heartily thank the many friends who have helped us hitherto, and we look forward with confidence to a wider circle of readers.

DISCUSSION AND CORRESPONDENCE

THE PARASITISM OF NEOCOSMOSPORA

IN SCIENCE for September 13, 1907, Dr. Erwin F. Smith, of the Bureau of Plant Industry, U. S. Department of Agriculture, makes certain criticisms on work which the writer published some time ago in a bulletin of the Missouri Agricultural Experiment Station and in a note in SCIENCE.

My purpose in writing the papers mentioned was to record in permanent form observations which I had made in course of a study of the ginseng fungus. I submitted some conclusions which it seemed proper to draw, because there has been more or less disagreement on the parasitism of these fungi among mycologists.