Also no reference seems to be made of the ancient irrigating ditch that now skirts the bluffs east of the Jemez River, some twenty-five feet above the present ditch. Also no mention has ever been made of the petroglyphs on "red rock" in the valley about a mile north of the present village of Jemez. Here are drawings of deer, lightnings, snakes, the sun and moon, Montezuma and the footprints of "the great road-runner."

Albert B. Reagan

Nett Lake School,
Orr, Minn.

Map of Massachusetts Wanted

To the Editor of Science: The U. S. Geological Survey published in 1889 a four sheet map of Massachusetts and Rhode Island, scale $1/250000$ contour interval 100 feet, forming a sheet 48×30 inches, and engraved by Julius Bien. Any person possessing a copy of this map and willing to loan the same for a short time would confer a great favor by communicating with the subscriber.

B. K. Emerson

Amherst College

The Berkeley Astronomical Department

To the Editor of Science: It has recently come to the attention of the Berkeley astronomical department of the University of California that Dr. See's reference to it (p. 479 of the issue of Science of Oct. 8, 1909) has created an erroneous impression concerning the connection of the department with his recent theories of cosmogony. This note is to point out that the Berkeley astronomical department has, in no way, either approved or disapproved them. Its attitude has been entirely neutral, as is evidenced by several newspaper interviews, in which it has always been definitely stated that the department would be in no position either to affirm or to refute any of Dr. See's theories until the completed work becomes available. This completed work has not yet appeared.

It is to be added that from June, 1908 until August, 1909, Professor Leuschner, director of the students' observatory of this department, was abroad on leave and that the writer, as acting director, is entirely responsible for all matters emanating from here during that interval.

R. T. Crawford

Berkeley Astronomical Department,
University of California,
November 6, 1909

Scientific Books

Foundations of American Grape Culture. By T. V. Munson, D.Sc. Denison, Texas, T. V. Munson & Son. 1909.

The colossal work of Dr. Hedrick and associates of the Geneva (N. Y.) Agricultural Experiment Station (already reviewed in Science)[1] has been of inestimable service in furnishing a ready means of identification of grape varieties under cultivation, by means of superb colored illustrations and detailed descriptive matter. That volume is mainly devoted to results of tests and observations at the station on a very wide range of cultivated varieties, and does not assume to discuss botanical relations or the subject of interbreeding, except as standards of reference.

Those who have for many years watched the determined, painstaking labors of Dr. Munson, in Texas, have anticipated pleasure and profit from the monument he was expected to erect in the form of a book recording the outcome of his patient work and great sacrifices to compass the production of advanced types of grapes in the arduous process of breeding for quality.

"Foundations of American Grape Culture" comes as a veritable boon to many who owe its author much for previous aid and encouragement in the tedious and unremunerative practise of grape breeding. It is so filled with meat, so well and compactly arranged and thoroughly indexed, so copiously illustrated with most excellent reproductions from life, and so thoroughly digested, that it is impossible to characterize its contents in a sentence. The volume is remarkable in breadth of scope, completeness of treatment and wealth of detail, yet in clearness, conciseness

[1] "The Grapes of New York."

and effective generalization it is no less conspicuous. The botanist, culturist and interbreeder will each and all find the latest word from an adequate authority whose conclusions are convincingly stated with all the evidence in plain view. The value of the conclusions, aside from the high reputation of the author, is made manifest by a vast accumulation of facts well classified in the text, and by 86 full-page half-tones from nature photographs and other appropriate illustrations.

These reproductions of seed, wood, leaf, flower and fruit, executed with consummate skill of photographer and printer, under the jealous scrutiny of Dr. Munson, are far beyond anything heretofore brought out in black and white in this line.

Preceded by a choice portrait of the author, as a frontispiece, followed by a dedication in form of an original poem, the preface states succinctly the reasons which necessitate founding American grape culture upon the native species as a base. A modest review of the author's lifetime work in this field, a clear statement of the ideals to be sought in the compounding of strains and a list of vineyards and nurseries used as experimental grounds during more than thirty years of observation, culture and breeding, fill out the introductory pages.

Chapter I., of 101 pages, on the Botany of American Grapes, is replete with information, and constitutes a contribution of great importance to science. This has the merit of presenting a very complex subject, not without autocratic decisions, but always with clear indication of the facts which justify such conclusions in the author's mind. Dr. Munson's observations have been more wide-spread and continuous, his studies more profound and his methods more precise than other investigators in this field. His revised scheme of classification here published may therefore be taken with confidence for just what he regards it—an attempt to arrange the species of grapes in a scheme of classification which shall, as nearly as possible, group them in accordance with natural relationships, that is to say, "in approximate chronological order of development," the unknown "chronology and actual genealogy" being inferred from similarities in form and especially from biological similarities. As such, this is a decided advance in systematic botany, although it is confessedly and approximately framed primarily for the guidance of practical culturists instead of philosophic students.

In this chapter the 28 species allowed (26 American, 2 foreign) are carefully described in minute detail, by botanical characters, with typical full-page illustrations, followed in each instance by very full "Viticultural Observations and Remarks," giving a vast amount of information regarding growth from seed and cuttings, foliation, inflorescence, resistance to disease, natural and artificial crosses and hybrids.

Chapter II., Breeding of Varieties of Grapes, covers 27 pages of valuable discussion on thoroughbred vines, selection of parents, order of germination, blooming periods, length of life, soil adaptability, climatic range, longevity, market value, analyses of fruit, graft stocks, selections of varieties for breeding north and south, for wine or table use, description of ideal variety, directions for crossing and hybridizing, collecting and preserving pollen, labeling seeds, planting seeds, care of seed-beds, transplanting, nursery treatment, and much valuable suggestion concerning allied subjects. Several tables of great interest are interspersed, making this chapter a most profitable mine of information of original character.

Chapter III., of 74 pages, arranges alphabetically by mother species the prominent varieties of grapes, discussing each very fully by descriptive text and full-page illustrations, showing the pedigree clearly and all details of origin, constitution and other information needed by growers.

Chapter IV., Adaptation of Varieties, treats of resistance to cold, heat, wet, drouth, soils, insects, fungi, followed by Select Lists of Varieties for Various Regions, giving a complete outline of distribution in eight zones. Of this arrangement, Dr. Munson justly remarks: "It is the opinion of the writer that this chapter is one of the most valuable pieces of grape literature ever presented to the prac-

tical grape-growers of the United States." At the close of the chapter is given a list of some of the best tested resistant graft stocks.

Four more meaty chapters on Practical Grape Growing are condensed in 24 pages. Chapter V. treats well of culture from the seed to fruiting, including selection and preparation of soil, choice of varieties, planting, trellising, pruning and training, fertilization, etc. Chapter VI., on Protection from Insects and Fungi, discusses preventive measures, including grafting on resistant stocks, spraying and other remedies, with brief descriptions of enemies to the vine. Chapter VII. is short and crisp, dealing with marketing of the crop, only touching on wine and brandy, but giving some space to the manufacture of grape juice, raisins, jams and jellies. Chapter VIII. gives important hints on the selection and treatment of vines for fruit, adornment and other home uses.

In the matter of indices, often lacking or deficient in works of this class, the author merits high commendation. He has placed at the close of the volume no less than five adequate synopses, as follows: (1) List of Illustrations, with 97 entries, italics being used to designate plates of specific types; (2) Synopsis of Chapters, a complete table of contents, itemized fully; (3) Index of Species and Varieties (211, in all, described in the work); (4) Index of Topics, a general index, exclusive of species and varieties; (5) List of Tables. There are ten of these, segregating statistics of importance, chiefly original with the author.

Thus compressed in 252 pages 7½ inches by 10½ inches, in a well-bound volume, with clear sharp type impressed on good heavy paper, the well-known author has met his eager public in most commendable dress. This outcome of his zeal and patience, measured from any view-point, must long be regarded as a model of its kind. Every new experimenter with grapes is set a quarter century ahead by the knowledge here vouchsafed, and the record of the author's achievement must serve as inspiration to a host of earnest students in the same field. The book brings into clear perspective for the first time the full measure of the scientific work of Dr. Munson. Its influence upon the development of viticulture the world over will be felt even more strongly by future generations.

Theo. B. Comstock

Los Angeles, Cal.

Exercise in Education and Medicine. By R. Tait McKenzie, A.B., M.D., Professor of Physical Education, and Director of the Department, University of Pennsylvania. Octavo of 406 pages, with 346 illustrations. Philadelphia and London, W. B. Saunders Company. 1909. Cloth, $3.50 net; half morocco, $5.00 net.

This book represents a distinct advance in the literature on physical exercise. It is well written, and interesting. It contains a good deal of material of scientific value. The various chapters are well supplied with first-class illustrations, some of which are from the author's own work. McKenzie's high rank as a sculptor is shown in the artistic features of these cuts. The text contains numerous references to the sources from which the author draws material. These references are ample for the general reader, though not sufficiently explicit for the investigating student.

The contents of the book are as follows:

Part I.: Exercise in Education—Chapter I., The Definition and Classification of Exercise; Chapter II., The Physiology of Exercise; Chapter III., Massage and Passive Motion; Chapter IV., Exercise by Apparatus; Chapter V., The German System of Physical Training; Chapter VI., The Swedish System of Gymnastics; Chapter VII., The Soft Business of Japan; Chapter VIII., Age, Sex and Occupation; Chapter IX., Playgrounds and Municipal Gymnasiums; Chapter X., Physical Education in Schools; Chapter XI., Physical Education in the College and University; Chapter XII., The Physical Education of the Blind, and Deaf Mute; Chapter XIII., Physical Education of Mental and Moral Defectives.

Part II.: Exercise in Medicine—Chapter I., The Application of Exercise to Pathogenic Conditions; Chapter II., Flat-foot and its Treatment; Chapter III., The Cause and