professor of German; B. Franklin Lovelace, Ph.D., now of the University of Alabama, to be associate professor of chemistry; Samuel O. Mast, Ph.D., now of Goucher College, to be associate professor of zoology; August H. Pfund, Ph.D., now associate, to be associate professor of physics; Charles F. Meyer, A.B., now fellow, to be assistant in applied electricity; Chester N. Myers, Ph.D., to be assistant in chemistry. In the Medical Faculty: Thomas R. Boggs, M.D., now associate, to be associate professor of medicine; Charles D. Snyder, Ph.D., now associate, to be associate professor of physiology; Frank J. Sladen, M.D., now instructor, to be associate in medicine; William E. Burge, Ph.D., now assistant, to be instructor in physiology; Karl M. Wilson, M.D., now assistant, to be instructor in obstetrics; Solon A. Dodds, M.D., to be assistant in obstetrics; Eli K. Marshall, Jr., Ph.D., to be assistant in physiological chemistry; Isaac R. Pels, M.D., to be assistant in dermatology; Maxwell Ross, M.D., to be assistant in medicine.

FACULTY additions and promotions in Adelbert College and the College for Women of Western Reserve University have been made as follows: Harry William Springsteen, assistant professor of physics, to be associate professor of physics; Clinton Raymond Stauffer, Ph.D., associate professor of geology; James K. Whittemore, M.A., appointed assistant professor of mathematics; Walter Edward Sullivan, M.A., instructor in biology. Faculty promotions and appointments in the medical department were made as follows: George Washington Crile, Ph.D., M.D., formerly professor of clinical surgery, was appointed professor of surgery; Carl August Hamann, M.D., formerly professor of anatomy, was appointed professor of applied anatomy and clinical surgery; Davidson Black, M.B., was appointed associate in histology and embryology.

IN the University of Michigan Museum, Dr. A. G. Ruthven has been promoted to be assistant professor of zoology and head curator of the museum; Miss Crystal Thompson has been made assistant in the museum. In the Department of Zoology, Dr. A. F. Shull, of Columbia University, has been made instructor in zoology, in place of Assistant Professor A. S. Pearse, who has become assistant professor of zoology in the University of the Philippines; Dr. George La Rue, of the University of Illinois, has been made instructor in zoology. Assistant Professor O. C. Glaser has been granted leave of absence during the first half of the next academic year.

AT Rutgers College instructors have been appointed as follows: F. F. Couch, M.E. (Lehigh), in mechanical engineering; Floyd E. Chidester, Ph.D. (Clark), in biology, and Harry R. Lewis, B.Sc. (Rhode Island), in dairy husbandry.

FRANK A. MANNY, of the education and extension departments of the Western State Normal School, Kalamazoo, Mich., has been appointed director of the training of teachers in the city of Baltimore.

THE trustees of the University of Pennsylvania at a meeting held on June 12, 1911, advanced Dr. John W. Harshberger from assistant professor of botany to professor of botany.

DISCUSSION AND CORRESPONDENCE

THE DISEASES OF ECONOMIC PLANTS

THE recent review of "Diseases of Economic Plants" by Dr. W. A. Orton[1] contained statements which I feel impelled to controvert, not in justification of the book, but in order to place the facts in their proper bearing before the readers of SCIENCE, lest some not technically informed should be led into erroneous conclusions by misstatements *ex cathedra*.

Some of his criticisms are merely matters of personal opinion, as, for example, his views on the use of the termination "ose" in naming diseases. This method was first suggested several years ago in a committee report before the American Association for the Advancement of Science, Section G, with Dr. Halsted as chairman. It has been used to

[1] SCIENCE, April 21, 1911, 621.

some extent in this and other countries for years, and while some pathologists do not favor it, many others do. Moreover, Dr. Orton himself, in a letter,[2] writing on this point, says, "I would even make use of the new terminology in cases where no other suitable common name is available."

His mention of "more serious errors" deserves attention. Here he objects to considering *Microsphæra alni* as a destructive parasite, saying, "This fungus is one of the least harmful of the pecan parasites." Fawcette[3] quotes Mr. W. A. Munsell, of Florida, as saying that this fungus "had practically destroyed the pecan crop the year before."

Orton says, "The injury to tomatoes from *Phytophthora* is overstated." We stated that "It is very injurious, causing complete devastation of the crop in some sections and resulting in the loss of many thousands of dollars."

Authority for this may be found in the statement of R. E. Smith,[4] a very careful and reliable worker, who says, "During the fall of 1907 the whole acreage of tomatoes was completely ruined in this manner (by *P. infestans*) before active shipment had begun, making the crop a total loss." Also "in the district mentioned the shipments fell off within a very short time, from 2,000 crates a day to practically nothing . . . many thousands of dollars were lost."[5]

Orton himself[6] says of this disease, "Quite common in Massachusetts . . . reported also in southern California, where it caused large losses to the winter crop."

Orton says, "Absurdly large losses are attributed to cotton anthracnose in Georgia."

Our words are:

> The disease is very destructive in some localities and prevails throughout a large portion of the cotton belt. In central Georgia it is said to destroy about 22 per cent. of the crop yearly, sometimes more; while to the state as a whole the loss is put at 17 per cent. or approximately $14,750,000.

I may here quote the following:[7]

> From middle to north Georgia the gradual decrease in per cent. of the crop destroyed is from 22 per cent. to about 12 per cent. and to south Georgia, from 22 per cent. to about 4 per cent. It is conservatively estimated that the anthracnose costs the farmers of the state at least 17 per cent. of the cotton crop. 1,800,000 bales are gathered in Georgia, which represents then, only 83 per cent. of the crop that should be made, the other 368,900 bales representing the actual loss. This valued at $40 a bale would be $14,756,000 loss in money.

De Loach, the author of this statement, in a recent letter says:

> My statistics carefully taken in sixteen counties of the state of Georgia, in 1906 and 1907, and amounting at the least to 2,000 bolls in a locality, prove clearly to me that for those years my figures were quite conservative. I always selected representative localities and fields, and was making the survey for no other purpose but to estimate the actual loss to the growers incurred by this disease. In several instances in Spalding and Hart counties there was 80 per cent. of the bolls infected, but of course not this per cent. actual loss, as many of the bolls were half good and half diseased.

Orton says: "The description of Bordeaux injury is incorrect, as is also the statement that blossoms are killed and the lives of bees endangered."

As to Bordeaux killing bees it must be recollected that apple spraying is the topic under discussion; that the only time bees would be injured is while the tree is in blossom; that when the tree is in blossom arsenicals are almost invariably used in the spray, hence to spray during blossom is, in practise, dangerous to bees.

The description of Bordeaux injury given in the book is drawn largely from the writings of Hedrick,[8] who wrote his description follow-

[2] February 14, 1910.

[3] Fawcette, H. S., Fla. Agr. Expt. Sta. Rept., 1907, LI.

[4] Report Cal. Agr. Expt. Sta., Bull. 203, p. 44.

[5] R. E. Smith, Cal., B. 175, p. 9.

[6] Yearbook, 1905, p. 608.

[7] Ga. Agr. Exp. Sta., Bull. 85, Tech. Ser., 3.

[8] Geneva Bull., 287, pp. 107–108, Nos. 7, 10 and 11.

ing long experience with Bordeaux injury, a personal experience that is certainly far more extensive than that of Dr. Orton. I quote here a recent letter from Hedrick bearing on this point.

I have just gone over the description you give of bordeaux injury in your "Diseases of Economic Plants" and in my bulletin on the subject. I can find nothing whatever to criticize in the statement you make in regard to this trouble. I may say that since my bulletin was published, I have had occasion to give a good deal of attention to Bordeaux injury and do not believe that I would now describe it differently than when the bulletin was written. My colleague, Professor Stewart, whom of course you know, and who has also given Bordeaux injury a good deal of attention, has just looked over your description and finds nothing to criticize in your discussion of the injury in question.

It is gratifying to know that in these "more serious errors" the text of the book does not deviate widely from a basis, founded on exceedingly good authority, authority in some instances, most instances in fact, as trustworthy as that of our critic.

Dr. Orton was requested to read and criticise the manuscript of our book prior to its publication. This he, with apparent willingness, agreed to do. The manuscript of a large portion of the book, including most of the part under discussion, was submitted to him and certain criticisms were received, some of which were accepted, some not, according to the judgment of the authors. For all of this the authors are grateful to Dr. Orton.

That Dr. Orton is much more aggressive and much more searching in this recent public criticism, *after publication, than in his private criticisms prior to publication* may, however, be shown by two quotations as well as by many other adduceable facts.

From letter February 16, 1910, "you already have a discussion of the most important non-parasitic diseases."

From review in SCIENCE, April 21, 1911, "The wilt and die back of the orange are omitted, as is the curly top of beet, one of the two most important maladies of that crop."

F. L. STEVENS

SCIENTIFIC BOOKS

The Stone Age in North America. By WARREN K. MOOREHEAD, A.M. Two volumes of 874 pp., 7 in. by 9¾ in., 17 plates, 4 of which are colored, and 735 figures in the text. Boston and New York, Houghton Mifflin Co. 1910.

This is the most ambitious work yet produced on the prehistoric implements of the United States. The book deals almost wholly with this area, although Ontario and a few other sections of the Dominion of Canada are briefly covered. Mexico and Central America with their highly developed stone age culture are omitted.

The opening chapters deal with the classification of stone implements according to form and material; with quarry sites and methods of quarrying; the making of projectile points and knives; the cached deposits of finished and incomplete implements; and the general distribution of types. Stone chipping in America had reached a high degree of excellence, and some of the finer examples from California, Tennessee and Ohio are probably not surpassed in workmanship by those of any section of the world.

The author next describes what he calls the celt-hatchet-axe-adze class of implements which includes adze blades of various types and the grooved and grooveless axe. They are shown in great variety. The remainder of the first volume is devoted to problematical forms. Under this general head are figured and described flat stone pendants, perforated tablets, winged ceremonials, "spud"-shaped objects of slate, pear-shaped pendants, discoidal stones, circular discs for paint, stone tubes, and other types. Nearly nine hundred of these objects are illustrated from photographs furnished principally by collectors.

The second volume opens with a chapter on bird stones and other effigies. This is followed by a treatise on the tobacco pipe. Beginning with the early tubular type a large variety is shown ranging through the simple curved and angular forms to the platform and effigy pipes.