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.

The next chapters are devoted to mortars, pestles, metates, mullers, stone dishes used in preparation of foods and paint, and to shell and bone ornaments, utensils, implements and weapons in considerable variety. The bone objects from the Mandan village sites are of special interest as are also the cut and inlaid bear teeth and engraved bones from the Ohio mounds.

The native copper implements of the Great Lakes region are well illustrated. The elaborate ceremonial forms from the mounds of Ohio and other sections are of great interest. Implements of this metal are principally knives and projectile points, perforated needles, fish hooks, adzes and axes. The ornaments are mainly beads, breast plates and ear buttons. Some of the symbolic forms are elaborate, especially those shown in repoussé designs. Various tribes in the United States had mastered the early stages of copper working, but they had not discovered the art of casting. All the forms shown were made by hammering, annealing, grinding, perforating, cutting or embossing. Sheet mica was also cut into symbolic and ornamental designs similar to those of copper.

A few textiles from the dry caves of Kentucky and the Ozark region and from the cliff-house ruins of Utah are described and illustrated. The twined woven shoes from the Kentucky caves are unique. The specimens shown in general however give but a faint idea of the great variety and beauty of the woven fabrics common among our Indians in early historic times.

The pottery of the United States is treated briefly, types from the various culture areas being shown. Many of the illustrations are from the publications of W. H. Holmes and C. B. Moore. The author writes, "In the far north there is no pottery." He forgets the well-made pottery bowls, lamps and cooking pots of the Alaskan Eskimo.

The following chapters are devoted to grooved axes, celts, pendants and other forms in hematite, and also to miscellaneous objects of stone, such as salmon clubs from Oregon and Washington, perforated stone club heads, grooved stones for straightening and finishing arrow shafts, semi-lunar knives of slate, etc.

The last two chapters are devoted to the author's conclusions which are grouped under several headings. He acknowledges his indebtedness to forty individuals who contributed plates, figures, or to the text, or who allowed the use of published material. The most important of these original contributions is the excellent bibliography of forty-one pages by Dr. Charles Peabody.

The "Stone Age in North America" is written primarily for collectors and the general public, but anthropologists will find much of interest in its pages.

The author's view point of American archeology is best shown by the following quotation from the opening chapter.

> It seems to me that the study of all these learned individuals, the results of which are set forth in the Indian "Handbook" [Bureau of American Ethnology], has led many of them to consider prehistoric life in America as nearly the same as the life of our Indians for the past one or two centuries. I can not believe that the arts of the past are the same to any appreciable extent as those which obtained at the time of the Lewis and Clark expedition.

Again in the closing chapter, referring to certain New Jersey archeologists, he writes:

> They understand conditions as they existed in ancient times, and that is something that few men of to-day grasp. It can not be learned from reading the reports, from studying in museums, or through obtaining a degree from one of our universities.

The failure to comprehend the culture of the prehistoric American Indians except through the study of their stone implements and similar remains is a defect common to many archeologists which is usually apparent in their writings. We can never acquire a comprehensive knowledge of ancient American peoples without first studying existing tribes, and working backward through history, for stone implements alone can teach little without the knowledge thus acquired.

CHARLES C. WILLOUGHBY