

tion of data, joined to the individual researches of a band of enthusiastic students abroad, as well as in our own country, that we owe this the best work on prehistoric America that has yet been published.

But whilst we thus gladly bear witness to the merits of this work, we must not forget the marks of carelessness which frequently disfigure its pages. Quotations and references are incorrectly given. Writers whose statements are more than doubtful, are given a prominence which they do not deserve; and there are assertions like the one (p. 82) as to the relative antiquity of the mounds in the Southern States, which needs proof, or that on p. 381, in regard to 'tempering' copper, which may or may not be true, depending on what is meant by the term. Finally, we must protest against the reference (p. 64) to the dogma of transubstantiation. Since that article of belief is held by rather more than half the Christian world, an offensive reference to it by the editor is not only uncalled for, but in excessively bad taste.

[The editor gladly inserts this review, written at his solicitation; but he does so without committing himself to the advocacy of the views therein expressed, which seem to maintain the identity of all peoples that ever inhabited the American continent up to the advent of Europeans. It seems to him that the progress of science demands that this should be looked upon as a question to which investigation may still be directed. While historical evidence, on which the reviewer lays such stress, undoubtedly gives the clew to recent peoples, we must certainly depend on archeological research for the data by which to decide all questions which concern the origin and relationship of those which preceded them.]

#### *A HANDBOOK OF HEALTHY AND DISEASED MEAT.*

IN Germany there is no need that an official should be ignorant of the duties he has to perform; for, no matter in how restricted a sphere he has to work, there are extended treatises covering the exact points, with which he should be acquainted. In the volume which lies before us, the inspector of meat, or the veterinarian who may be called upon to decide upon the fitness of animal flesh for human food, would find a good practical guide to the work.

*Handbuch der fleischkunde. Eine beurtheilungslehre des fleisches unserer schlachthiere, mit besonderer rücksicht auf die gesundheits pflegendes menschen und die sanitätspolizei.* Von Dr. ADOLF SCHMIDT-MÜLHEIM. Leipzig, Vogel, 1884. 8°.

The first part of the volume is devoted to a consideration of the morphology and chemistry of meat, with remarks on its general physiology and pathology. Then follow a practical description of the different kinds of food animals, and the various methods of killing, and of cutting up and preserving the flesh. After this is a chapter chiefly devoted to healthy meats and the changes which the different sorts undergo in digestion.

The last half of the book treats of diseased meat and the dangers of its use. In this lies the value of the work; as the special appearances, and the methods for their detection, are given in connection with each disease, as well as the disorders which may arise in man following their use as food, together with the means of prevention. Finally there is appended a digest of the laws of Germany and Austria regulating inspection.

The book is one which can scarcely be said to be of general scientific interest; and, on account of the language in which it is written, it will probably not be widely read by the class of men in this country to whom it would be of the greatest value. From a pecuniary point of view, a translation of such a work would not pay here at present; but from the economic interests which are connected with the subject, and the great protective influence which a well-maintained inspection of meat through our country would exert upon the public health, an edition in English, translated and published under the auspices of the proper department of the national government, would be of great and peculiar interest in the hands of the proper officers of our local boards of health.

#### *THE AMERICAN SOCIETY OF MICROSCOPISTS.*

THE American society of microscopists has published the account of the meeting held last August at Rochester. The volume is a neat octavo of nearly three hundred pages, with a few plates, and appears in part as a memorial of the late R. B. Tolles, whose lithographic portrait is prefixed to the titlepage. The portrait is such that its total absence will appear desirable to many. The address of the president, J. D. Cox, is substantially a review of the arrogant and ignorant attacks which Wenham repeated during so many years against Tolles's wide-angle lenses; and the contrast between

*Proceedings of the American society of microscopists. Seventh annual meeting.* Buffalo, Bigelow bros., pr., 1884. 4 + 300 p., [6] pl., illustr. 8°.

the bitter injustice of the English writer and the calm impersonality of the American optician, who was in the right, is skilfully woven into a tribute to Tolles's character. There follows a short appreciative memoir of Mr. Tolles by Dr. George E. Blackham.

The remainder of the volume is occupied by the papers and proceedings, and contains exceedingly little original matter. There are articles which repeat in detail perfectly familiar modes of work, and others which deal with those vague and worthless generalities of commonplace which characterize half knowledge. Of the latter, the essay by Dr. J. Redding is a too perfect example. It is on the extra-vascular circulation, and is largely formed of commonplaces, the rest being half truths and total errors. For example: Dr. Redding says (pp. 85, 86), "Bile, gastric juice, in fact all of the so-called secretions, together with the worn-out and effete tissue-detritus, are the result of physical disintegration of the outermost substance of the cells." What can one do to help the author? Perhaps print the whole sentence in italics, to point out the parts of it which are erroneous. We find, however, several articles of real interest. Some new appliances for convenient work are described. Gundlach's suggestion of a new method of construction for objectives of low power, with increased angular aperture, by changing the crown glass of an achromatic lens, and adapting the flint glass to it, is noteworthy, and may lead to a valuable improvement. Attention should also be called to the very deserved criticism, by Edward Bausch, of the English 'society screw,' which is every thing save a good standard. It is much to be regretted that the volume contains so very little of results of original research.

#### THURSTON'S METALLIC ALLOYS.

IN this volume are brought together the results of the author's work<sup>1</sup> on metallic alloys, with an introductory chapter on the history and characteristics of metals and their alloys, which is in the main the same as that to part ii., and two chapters, one containing an enumeration of the uses of the non-ferrous metals, and a statement of the location and reduction of their various ores; and the other, interest-

ing descriptions of the newer methods of working hot and cold metals.

The scientific value of the experiments, whose record and discussion constitute the principal features of the book, and which were confined to the mechanical properties of commercial copper, tin, zinc, and their alloys, — attention being chiefly given to the strength and elasticity of these alloys when subjected to tensile, compressive, bending, and twisting forces, — is diminished by the failure to exercise due care in the preparation of the alloys. The need of great care in this matter is recognized and emphasized by investigators, for most alloys exhibit phenomena of liquation; that is, they tend, when melted and about to solidify, to separate into their constituent metals, or into several masses composed of different alloys. Special precautions with respect to purity of the metals, rate of cooling, oxidation, temperature during melting, frequency of agitation, etc., must therefore be taken, if the resultant solidified mass is to be homogeneous.

Professor Thurston is fully aware of this liability to liquation; but on "assuming charge of a series of experiments on the characteristics of alloys, and an investigation of the laws of combination," the duty assigned him by the U. S. board, we find him holding the following view of the work:—

"The intention in the work here to be described was, not to determine the character of chemically pure metals, melted, cast, and cooled with special precaution, but to ascertain the practical value of commercial metals, as found in the markets of the United States, melted in the way that such alloys are prepared in every foundry for business purposes, and cast and otherwise treated in every respect as the brass-founder usually handles his work; and to determine what is the practical value to the brass-founder and to the constructor of commercial metals, treated in the ordinary manner, and without any special precaution or any peculiar treatment."

The book will be acceptable to the engineering public; for, besides the author's own work, it contains the views and results of other investigators, extensive tables on the physical and mechanical properties of bronzes and brasses, and Bolley's compilation of the technically useful alloys, the author increasing this rich collection still further by recipes from French and American sources. The determination and topographical representation of 'the strongest of the bronzes' will also be found of decided interest.

*The materials of engineering.* Part iii. *Non-ferrous metals and alloys.* By Prof. R. H. THURSTON. New York, Wiley, 1884. 14+575 p., illustr. 8°.

<sup>1</sup> Reports of U. S. board to test iron and steel, etc., vol. i. 1878, and vol. ii. 1881.