some of the more obscure cases of vegetable pathology depend on the minute fermentative bodies which, it should seem, play such an important part in animals. Certain it is that yeast globules and bacteria occur in vegetables where there is, apparently, no immediate communication with the atmosphere, or where, at least, it is as obscure as in some cases which engage the attention of the students of animal biology. Matters which have been long since ascertained to be facts, are still challenged by incompetent and uninstructed observers, and every one who can remove any portion of the prejudices which so materially retard the progress of science, will be doing a good work.

It is to be regretted that the quarto form of the work before us makes it very inconvenient for students, and it is to be hoped that a revised edition in octavo will secure a wider circulation. M. J. BERKELEY

AMERICAN NATURAL HISTORY

The American Naturalist. A popular illustrated Magazine of Natural History. Vols. 1, 2, and 3, from March 1867, to February 1870. (Salem, Mass. Peabody Academy of Sciences. London: Trübner.)

WE have several distinct reasons for bringing this useful periodical before the notice of our readers. In the first place, American Naturalists and writers on science generally complain, and not altogether without reason, that many of the most important works that issue from the Transatlantic press are much less known in this country than their merits deserve. Our personal experience leads us to believe that this complaint is well founded. We lately applied in vain to the Libraries of the Royal Society, of the University of Cambridge, and of a Scottish University, for the *American Naturalist* and for Clark's "Mind in Nature;" and we suspect that very few copies of such books as the following are to be found in English libraries, namely, a complete set of the works of Agassiz since he went to America, Binney's "Terrestrial Mollusks of the United States," Gould and Binney's "Report on the Invertebrata of Massachusetts," Tooney and Holmes's "Fossils of South Carolina," Samuel's "Birds of New England," Dekay's "Fishes and Reptiles of New York," the reports on the Pacific and other Railway Surveys, and the numerous contributions to science published during the last few years, by Marsh, Lea, Leidy, Hall, Wynam Baird, Coues, Packard, Scudder, Le Conte, Stimpson, Verrill, and a host of other writers.

Our second and chief reason for noticing the *American Naturalist*, is on account of its intrinsic value. The three volumes now completed contain a series of important original contributions, by Professors Bailey, Cope, Edwards, Hayden, Henrichs, Orton, and Verrill, Drs. Brewer, Cooper, Coues, Hunt, Joseph Jones, Le Conte, Lincecum, Norton, A. S. Packard, Perkins, Wood, &c. Messrs. Brigham, Dall, Hartt, Hyatt, Lockwood, Morse, Russell, Scudder, and many others. Botany, Geology, Physical Geography, and Zoology, receive their due shares of attention, and in a scientific point of view, the articles occupy an intermediate position between those which we find in "The Annals of Natural History" and Hardwicke's "Science Gossip." Each number contains (1) Original Articles; (2) Reviews of Works on Natural History; (3) Natural History Miscellany, including recent discoveries in Geology, Botany, Zoology, and Microscopy, and terminating with answers to correspondents; (4) Proceedings of Scientific Societies; the whole concluding with a List of Books Received, and a glossary of all the scientific terms occurring in the current number.

If our readers require any further evidence of the value of this periodical, we may add that after one year's independent existence, it has been issued as a publication of the Peabody Academy of Sciences. The trustees "consider it one of the legitimate objects of their trust to assist in the publication of the *Naturalist* by advancing funds sufficient to enable the editors to continue its publication in an improved condition."

Our third and last reason for now urging the claims of this periodical is, that being informed by Messrs. Trübner and Co., to whom we are indebted for the loan of these volumes, that new subscribers can for a time obtain the parts already published at a reduced rate; this seems to be an excellent opportunity for natural history clubs and libraries, both to obtain the back volumes and to order the future numbers. G. E. D.

OUR BOOK SHELF

The Science and Art of Arithmetic, for the Use of Schools. Part I., Integral. By A. Sonnenschein and H. A. Nesbitt, M.A., University College, London. (London: Whittaker and Co.)

FORTY years have elapsed since the appearance of Prof. De Morgan's "Elements of Arithmetic," at a time when perhaps few teachers, as they submitted the rules of the science to their pupils, cared to establish them upon reason and demonstration. The effect of this work was that a rational arithmetic began to be taught generally, and the mere committing of rules to memory took its due subordinate position in the course of instruction. Such a method of treatment will go far to develop and exercise the reasoning powers, and in the case of many pupils, there is hardly any other subject which can so well be made a groundwork for the exercise of the reasoning faculty. The book before us is avowedly drawn up in agreement with the principles of Mr. De Morgan's work, and the aim of the authors is to lead the student "to the discovery of the several rules by some path such as an original discoverer might have travelled." In this first part, which treats of Integral Arithmetic, we consider that they have carried out their principles successfully, and hope they will succeed as well with the remaining two parts, which are to embrace respectively Vulgar Fractions and Approximate Calculations. The rules enunciated are few and tersely given; there is a great store of illustration; elementary difficulties are well stated and honestly grappled with, and cleared up in a way that brings the subject to the level of the capacities of junior students; at the same time advanced as well as young teachers may gather much that is useful from the book. A reader who has carefully gone through the work, can hardly fail to master the early details of the science; if he fail, it will not be the fault of the authors. The subjects treated of are numeration, modes of computation, the so-called first four rules, contracted operations, scales of notation, and properties of numbers. Under this last division we have much valuable matter grouped under the several heads of Divisibility of Numbers, Casting out Nines, Resolution into Prime Factors, Greatest Common Measure, and Least Common Multiple. Throughout and at the end of the work occur numerous examples, very varied, all of which are carefully