nuity served as an incentive to his associates, who were drawn closely to him by his enthusiasm and entire lack of egotism.

There is no doubt that in the death of Professor Beecher, not only has Yale sustained a serious loss and paleontology a severe blow, but the ranks of those capable of bringing to the study of fossils keen insight and a philosophical spirit of enquiry, guided by principles whose value can hardly be exaggerated, are diminished by one whom science could ill afford to lose, and to whom, humanly speaking, there should have remained many years of industrious and fruitful research. W. H. DALL.

SCIENTIFIC BOOKS.

THE MARK ANNIVERSARY VOLUME.*

VOLUMES in celebration of some noteworthy educational event are more common in Europe than with us, and naturally so. The advanced courses of instruction which alone can produce a body of trained disciples have had only about a quarter of a century's existence in America. As time goes on these memorials will doubtless increase in number; at present they can be counted on the fingers of one hand.

Few men have had more influence upon the highest class of zoological work in America than Professor Mark. Leaving his early mathematics and astronomy, he went to Germany, worked there with Leuckart and Haeckel and, on his return, at once entered the teaching force at Harvard. What he has accomplished during these years can only be realized by reading the list of the one hundred and forty former students who sign the appreciative dedication of this volume, and by examining the long list of papers turned out from the laboratory under his charge.

* 'Mark Anniversary Volume To Edward Laurens Mark, Hersey Professor of Anatomy and Director of the Zoological Laboratories at Harvard University, in celebration of twenty-five years of successful work for the advancement of zoology, from his former students, 1877–1902.' New York, Henry Holt and Company. 1903. Pp. xiv + 513; 36 plates.

It is impossible for one man to write a critical review of the twenty-five papers which are contained in this splendid quarto volume. Even a bare summary of the articles will take more space than this journal can spare. All that can be done is to enumerate the papers, with such hints of their contents as will convey some idea of their scope. A fine photogravure of Professor Mark forms the frontispiece; then follows the dedication, to which allusion has been made, and next the papers which make up the volume. These have a wide range of subjects, but one thing which is striking is the small number of strictly embryological articles such as formed the bulk of the work from his laboratory during the first half of his labors at Harvard.

Two of the papers deal with habits. H. R. Linville deals with a couple of tube-building annelids, describing among other things the manner in which they build their tubes; while Jacob Reighard gives a long, detailed and interesting account of the habits of *Amia*, especially during the breeding season and the care of the young.

Four of the papers describe new species. C. A. Kofoid describes a new protozoan, *Protophrya ovicola* allied to *Opalina*, found in the food sac of *Littorina rudis*. S. Goto gives an account of two new medusæ, *Olindoides formosa* and *Gonionema depressum*, from Japan, pointing out that these genera with *Olindias*, *Halicalyx* and *Gonionemoides* form a natural family Olindidæ, and that the problematical fresh-water genera *Limnocodium* and *Limnocnida* belong near them. Four new species of trematodes, three of them from the air passages of snakes and one from the frog, form the subject of the paper by H. S. Pratt, while H. P. Johnson describes three species of polychæte annelids from the fresh waters of the world, enumerating in his article twenty-four species of the group known to occur in fresh water.

The morphological articles are more numerous. J. H. Gerould discusses the development of *Sipunculus* and *Phascalosoma* from the beginning of gastrulation to the escape of the larva, pointing out that the 'serosa' of *Sipunculus* is a modification of the prototroch

of *Phascalosoma*. Ida Hyde has examined the eyes of *Pecten* with the aid of modern neurological methods, and concludes that our previous interpretation of the function of some parts must be erroneous. H. B. Ward gives a detailed account of several larvæ of the bot fly, *Dermatobia hominis*, which occur as parasites in man and other warm-blooded animals in the tropics.

Two papers deal with the Tunicata. William E. Ritter has a new tunicate, *Herdmannia claviformis*, from California, the anatomy of which is detailed and some facts concerning its development are given. It apparently belongs near *Amaroucium*, but must form a new family. F. W. Bancroft found a colony of *Botryllus* at Naples which partly died down and then exhibited rejuvenescence. The physiology and the structural changes involved are described, the author concluding that deficient nutrition was the cause of the phenomena observed.

H. V. Neal and W. A. Locy both deal with the nerves of sharks. Neal describes the method of the formation of the ventral roots of the spinal nerves, analyzing the fates of various cellular elements which have been described in the cord, and concluding that all the neuraxones are formed from medullary cells and that the cells of the ventral nerves are concerned alone in the formation of the neurilemma and possibly some of the connective tissue. Locy returns to his 'new nerve,' which parallels more or less closely the olfactory nerve. He has now found it in nineteen genera of elasmobranchs, but finds no traces of it in the teleosts and amphibians which he has studied. P. C. Sargent takes for his contribution an account of that peculiar structure, the torus longitudinalis of the teleost brain, which he shows is nervous in character and serves as a center for the receipt of those impulses from the optic nerves which call for quick reflexes. C. H. Eigenmann has been fortunate enough to obtain eggs of the blind fish, and he has given here an account of the development and degeneration of the eye.

R. M. Strong shows that the metallic colors of the feathers on the neck of the domestic pigeon can not be explained as produced by diffraction spectra or by refraction prisms, but that they must arise as thin plate interference colors produced between the contained spherical pigment granules and the outer transparent layer of the feathers.

Thomas G. Lee presents a paper on the fixation of the ovum in the striped gopher, *Spermophilus tridecemlineatus*, the first of a series on the development of this form. The details are not readily presented in abstract, but it is shown that this form differs from all other mammals in the temporary fixation mass.

The only paleontological paper is by C. R. Eastman upon the peculiar selachian fossils, *Edestus* and its allies, which are known chiefly by a peculiar series of structures, often interpreted as spines, but now shown to be a coiled series of symphysial teeth, the structures reaching their extreme in *Helecoprion*.

The subject of variation is treated in two papers by Dr. and Mrs. C. B. Davenport. Dr. Davenport compares the variability of the scallops from Florida and from southern California, showing that the latter are much more variable and correlating this with the more varied environment and the greater geological changes on the Pacific coast. Mrs. Davenport has studied the number of stripes in the sea anemone, *Sagartia leucolena*, and concludes that their number is in part due to longitudinal fission. She also confirms the observations of Torrey and Parker which show that the monoglyphic conditions so frequently found in normally diglyphic hexactinians are to be explained by the same type of asexual reproduction.

The two physiological papers, by G. H. Parker on the phototropism of *Vanessa antiopa* and by R. M. Yerkes on the reactions of *Daphnia* to light and heat, hardly admit of summary. Parker shows that *Vanessa* creeps and flies towards the light, but comes to rest with its head away from strong light. When the eyes are blackened all phototropism ceases. It is not affected so much by strength of light as by the size of the light area, and its retreat at night is largely dependent upon temperature changes. In *Daphnia*, according to Yerkes, phototropism occurs with light of all

intensities and heat seems to have no effect, except in the absence of light, when they migrate to the colder area. Experiments also show that heat does not act in the same way as light upon the organism.

H. S. Jennings points out that in infusoria and in certain rotifers, besides the radial and bilateral types there is a third type, the spiral or at least one-sided, asymmetrical type of structure with a definite relation to the method of movement and life. In the rotifers this asymmetry affects the internal organs as well as the external features which cause the spiral swimming.

The only cytological paper is by R. Floyd, who describes the nerve cells of the cockroach under various kinds of preservation. He concludes that all nervous studies must be controlled by study of the living tissue. The thoracic ganglion cells have no evident cell walls. The cytoreticulum is studied, but no classification of the cells found was possible.

Last to be mentioned is the paper by W. E. Castle and G. M. Allen on the heredity of albinism and Mendel's law. They have experimented with mice, guinea-pigs and rabbits, and find that complete albinism is always recessive. A suggestion is made to account for the phenomena of mosaics, and it is pointed out that cross-breeding frequently brings out latent characters and that this probably affords the explanation of many cases of reversion.

In closing this synopsis of the volume the reviewer may be allowed to praise the mechanical execution of the work. The plates—produced by lithography, heliotype and other photo processes—*illustrate* the papers. The proof-reading has been done in a careful manner, and probably the work owes not a little of its many excellencies to its editor, Dr. G. H. Parker.

J. S. KINGSLEY.

SCIENTIFIC JOURNALS AND ARTICLES.

The Bulletin of the American Mathematical Society for February contains the following papers: Report of the Tenth Annual Meeting of the American Mathematical Society, by F. N. Cole; Report of the Cassel meeting of the Deutsche Mathematiker-Vereinigung, by R. E. Wilson; 'On a Test for Non-uniform Convergence,' by W. H. Young; 'On the Condition that a Point Transformation of the Plane be a Projective Transformation,' by Elijah Swift; 'Note on Cauchy's Integral,' by O. D. Kellogg; Review of Bauer's Algebra, by L. E. Dickson; Shorter Notices of Wölffing's Mathematischer Bücherschatz, Bucherer's Vektor-Analysis, and Ferraris's Grundlagen der Elektrotechnik; Notes; New Publications.

The March number of the *Bulletin* contains: Report of the December Meeting of the San Francisco Section, by G. A. Miller; Report of the Fifty-third Annual Meeting of the American Association for the Advancement of Science, by L. G. Weld; 'On a Gap in the Ordinary Presentation of Weierstrass's Theory of Functions,' by W. F. Osgood; 'On the Theorem of Analysis Situs Relating to the Division of the Plane or of Space by a Closed Curve or Surface,' by L. D. Ames; Review of Hadamard's Propagation des Ondes, by E. B. Wilson; Review of Burkhardt's Theory of Functions, by L. E. Dickson; Notes; New Publications.

SOCIETIES AND ACADEMIES.

THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON.

THE 355th meeting was held on February 9. A letter from Miss Fletcher was read in which she stated that, owing to sickness, she would not be able to deliver the presidential address. A letter from Dr. Daniel Folkmar describing the anthropological work he is carrying on in the Philippines was read by the secretary.

Dr. Ales Hrdlicka exhibited cremated human bones from the Choptank River, Md., collected by Dr. Elmer Reynolds, and stated that they are interesting as the first evidence of cremation in the eastern United States except in Florida. Dr. Reynolds, who was present, described the conditions under which the remains were found.

The first paper of the evening, by Mr. W. E. Safford, discussed the question, 'Were the Aborigines of Guam Ignorant of the Use of Fire?' Mr. Safford showed in the clearest manner the origin of the myth that the Chamorros of Guam were fireless at the dis-