The jack rabbits have at present little commercial value; their skins are used to some extent for furs, and many of the animals are sent to the markets of the larger cities and sold as food. It is estimated that some 600,000 are annually consumed in the United States, the greater part being sent to the larger Eastern cities. It is believed that "commercial utilization is the most promising and least expensive method of keeping these pests in check in localities where they are unusually abundant; but returns from this source will only partially offset the losses sustained on account of injuries to crops."

"In America," says Dr. Palmer, "the rabbit question never has, and probably never will assume the proportions it has assumed in Australia. The jack rabbits of the United States are all indigenous species and ordinarily are held in check by natural enemies and by disease. Although local conditions may sometimes favor their temporary increase, yet natural agencies aided by the persistent and constantly increasing war of extermination are gradually, but none the less surely, diminishing their numbers."

Incidentally some account is given of the rabbit pest in Australia, New Zealand and Tasmania, due to the introduction of the common rabbit of Europe (*Lepis cuniculus*), about thirty years ago, for purposes of sport. As is well known, they multiplied so rapidly as to become soon a very serious pest. Dr. Palmer cites statistics showing that about $5,500,000 had been expended prior to 1888 for their destruction, and in building several thousand miles of rabbit-proof fences for the protection of crops.

J. A. A.

Catalogue of Fossil Fishes of the British Museum. Vol. III. By Arthur Smith Woodward, F. C. S., F. Z. S.

Since the publication of the first volume of this series the student of vertebrate morphology, not less than the specialist, has felt that he was to be indebted to Mr. Arthur Smith Woodward for an admirable text-book on the entire subject of Fishes. Critics have universally commended the catalogue, from its general plan down to the details of its text figures and plates, a work which only could have been written by one who has had the long experience, the broad judgment, to say nothing of the industry, of its author.

The volume which has recently appeared deals with those groups of fishes popularly known as Mesozoic Ganoids, and reviews this subject in such a way that the fourth volume of the series, beginning with the 'Teleosts,' may complete the catalogue. It is understood that a supplememtary volume will thereafter be published to supply omissions and to bring the entire subject up to date. Those only who know the confusion which has existed in our knowledge of extinct Ganoids—confusion due to a large and scattered literature, faulty nomenclature, imperfect and partial study—can appreciate the degree of order which has been infused into the entire subject by the present work. Indeed, one may well believe that this volume could not be possible had its author not felt it necessary to visit every noteworthy collection, at home and abroad, for the purpose of making comparison of his material.

The present volume begins with a review of the structural relations of the following groups: the Palæoniscoids of the Trias, *Catopterus* and *Dictyopyge;* the Protospondyli, *Semionotids, Macrosemiids, Pycnodonts, Eugnathids, Amiids, Pachycormids;* the Aetheospondyli, *Aspidorhynchids, Lepidosteids;* the Isospondyli, *Pholidophorids, Leptolepids.* Then follows the catalogue proper, a careful review of the systematic side of the subject, with complete reference lists and descriptions, illustrated by numerous text figures. Among these are a number of new and admirable restorations, including those of *Dapedius, Cleithrolepis, Eugnathus, Caturus, Hypsocormus, Aspidorhynchus* and *Leptolepis.* There are also eighteen plates illustrating those specimens in the Museum which prove of especial interest. A careful review of the book brings out clearly that the treatment of the subject is a purely morphological one, and that the most recent studies on the modes of evolution have been brought into good use. General conclusions have, in the majority of cases, been drawn from the study of progressive series, as, for example, where the author shows that "the most advanced stage of the endoskeleton (of *Neor-*

hombolepis and *Otomitla*) is attained in the latest members of the race with the least modified exoskeleton or when he notes that at the time the jaw elements become more simplified among the Teleostomes, a 'new vigor' is apparently infused into their race, marked by the outcrop of a varied series of families. By this means parallelisms have been largely evaded, but of these many interesting examples are cited, as the structures arising in the *Semionotids* and *Macrosemiids*, which are clearly interpretable as the result of similar physiological needs. And it was only after the closest scrutiny that the author was inclined to follow the lead of Prof. Cope in selecting fin structures as the most constant elements in comparison. The old tenets of classification, the characters of scales and even of vertebral axis, were found to be of decidedly minor importance, in the case of scales, as in *Eugnathus* and *Caturus* of not more than generic value. Throughout the volume phylogenetic views are seldom expressed definitely, for even the splendid series of forms which the author has been able to study has not convinced him, in the majority of cases, of more than probable kinships; thus we learn that the "origin of the Chondrostei is still entirely obscure," or that "it seems most reasonable in the present state of knowledge to place the Oligopleuridæ with the (Pholidophoridæ) near the base of the Isospondylic Series," or, again, that, "if speculation were permitted in seeking the direct ancestors of the Pycnodonts, it might be most profitable to turn toward the earliest Mesozoic fishes of the *Colobodus* type."

Mr. Smith Woodward regards his volume as acceptable 'merely as a convenient basis for further research, full of imperfections which each specialist will readily discover for himself.' But when one is familiar with the researches of its author, and knows, moreover, that the present volume embodies four years' diligent work, we may naturally expect that its sins, either of omission or commission, will not prove formidable. If criticism must be found one might be inclined to regret that the number of text figures, especially restorations, were not larger, although be it understood that from the obvious nature of the catalogue this number is already a goodly one. BASHFORD DEAN.

The Cyprinodonts. By S. GARMAN. Memoirs of the Museum of Comparative Zoölogy at Harvard College. Vol. XIX., No. 1, pp. 179, pls. XII. 1895.

The present monograph on the 'top minnows' has been based upon Mr. Garman's studies of the remarkable—possibly the most complete—collection of these forms, that of the Agassiz Museum at Harvard; and it is certainly one of the most valuable of recent contributions to the study of Fishes. It is important to the systematist, because there is scarcely a group of recent Teleostomes which has stood in greater need of critical revision, for the Cyprinodonts are not merely a large and scattered group, profusely and often very imperfectly described, but one whose species present a most confusing range in coloration, dentition and sexual characters.

One cannot help feeling that in the systematic portion of the work Mr. Garman's studies of the variation among members of each species have enabled him to interpret 'specific' differences with modern broadness, and that the order which has been drawn out of the tangle of synonymy (where a single form had, for example, been placed by various authors in as many as a half dozen 'genera') is one which will prove of permanent value. The monograph is one which, like that on the Discoboli, does fitting justice to its author's careful work; it might well be taken as a model of thoughtful preparation. The plates are admirable examples of the work of the artist and of the lithographer, and especially interesting are Pls. IX.–XII., which were drawn by Sonrel for the elder Agassiz.

The wide range in structural characters which the Cyprinodonts have evolved has been brought out clearly in the introductory portion of the monograph, but perhaps not as fully as many morphologists would desire. But the arrangement of the material with a view of sketching broadly the evolutional problems suggested by this group is certainly satisfactory. And there can be no doubt that many well-trained morphologists will here learn, for the first time, that sexual dimorphism—where the males or females of the same species will be either sinistral or dextral—may occur among