

*codon*, etc., we find that the degree of advance displayed by these forms is not so very great and that it does not involve any very long lapse of time. The radical difference between the two faunas consists in the ordinal groups which are present in one and not in the other. Thus the Puerco has neither artiodactyls, perissodactyls nor rodents, while the Wasatch has no Multituberculata and relatively few Condylarthra, and the creodonts of the two formations belong, for the most part, to quite different types. The obvious significance of these facts is that at some time between the Puerco and the Wasatch a great migration of mammals from some other region took place and revolutionized the character of the North American fauna.

A distinction that is likely to be fruitful of important results is Osborn's division of the placental mammals into the Mesoplacentalia, of early and more or less Mesozoic type, and the Cenoplacentalia, characteristic of later Tertiary and recent time. "The difference between these two groups consists mainly in the lower state of evolution and apparent incapacity for higher development exhibited by the Mesoplacentals, in contrast with the capacity for rapid development shown by the Cenoplacentals." It can hardly be right, however, to include the creodonts in the lower group, since they not only underwent a great expansion in the Puerco, but in later times they also gave rise, by independent development along at least three lines, to the true Carnivora. Such a group cannot be fairly charged with 'incapacity for higher development.'

This necessarily brief review cannot do more than indicate the many points of unusual interest in this paper, and must refer to the original those who would learn more of it.

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*The Ornithology of Illinois; Descriptive Catalogue.* By ROBERT RIDGWAY. Published by authority of the State Legislature. Vol. II. May, 1895. Large 8°, pp. 282, pls. 33.

Ridgway's Ornithology of Illinois has a curious history. It was conceived by the able Director of the Illinois State Laboratory of Natural History, Prof. S. A. Forbes, who twelve years ago asked the leading American ornithologist to undertake its preparation. Mr. Ridgway finished the manuscript early in July, 1885. The first volume was finally printed, but the entire edition, together with the plates and cuts, was destroyed by fire. This was in February, 1887. It was reprinted from proof sheets, and proof of the reprint was not submitted to the author. It was issued in November, 1889.

By a singular fatality, the manuscript of the second volume was consumed in the same fire; and, excepting proof of the first 90 pages, which was preserved, the entire book had to be rewritten. This formidable and disheartening task was accomplished in 1891, and the printed book has just been received (May 7, 1895).

The original plan contemplated two distinct parts: Part I., Descriptive Catalogue, by Robert Ridgway; Part II., Economic Ornithology, by S. A. Forbes. The present volume completes the Descriptive Catalogue, and it is earnestly hoped that the volume on Economic Ornithology will follow; though the labor of preparing such a work is too great to be accomplished in a single lifetime or by a single man.

The first volume is prefaced by an introduction of 35 pages, treating of the physical features of the State, the climate, and characteristic features of the avifauna, and ending with a bibliography. The systematic part begins with a key to the higher groups, which are arranged in the old style, the Thrushes coming first. The orders, fami-

lies and genera are defined, as well as the species. Some of the descriptions are original, but most of them are quoted from 'Baird, Brewer and Ridgway's History of North American Birds', and its continuation, the 'Water Birds of North America,' for which work, as everyone knows, they were originally written by Mr. Ridgway. The general matter is not very full and is frequently quoted from the same work. Unfortunately about two-thirds of the biographical part was omitted because of the necessity of limiting the number of pages. There are numerous quotations from Mr. E. W. Nelson's papers on the birds of Illinois, and a few personal observations by the author, chiefly relating to the Austroriparian fauna of the extreme southern part of the State, where he has done much field work, extending over a long period of years. A novel feature is a synonymy of popular names, given under each species.

The first volume covers 520 pages and is illustrated by 32 plates; the second volume covers 282 pages and has 33 plates. Nearly all the plates in both volumes are from Baird, Brewer and Ridgway, and Ridgway's Manual. Most of those in the second volume were made originally for this work, but owing to delay in publication were first used in the 'Manual.' The great majority are outline figures of heads, wings and feet; but some are shaded cuts of birds. Owing to the destruction of the electros, part of these are process reproductions made from proofs and are poorly printed. The frontispiece is a beautiful colored picture of a Meadowlark in full song, drawn by the author, and of unusual excellence.

In faunal works relating to particular areas it is customary to record somewhat in detail the manner of occurrence of each species, to indicate breeding ranges, time of nesting, dates of migration and so on. Very little information of this kind is to be found in the Ornithology of Illinois. The

work consists mainly of technical descriptions and synonymy, to which is added, under each species, a paragraph or two of general matter which as a rule, excepting the quotations from Nelson, is hardly more pertinent to the State of Illinois than to any other part of America where the bird occurs.

Of 49 species classed by Mr. Ridgway as rare, detailed records of occurrence within the State are given for 36.

Mr. Ridgway states that the intent of the book was "to supply the people of Illinois with an inexpensive work which would enable them to identify the birds they desired to learn the names of, and to acquaint them with their leading characteristics." These primary aims the work certainly has fulfilled.

C. H. M.

*Tests of Glow-Lamps:* W. E. AYRTON and E. A. MEDLEY. The Philosophical Magazine, May, 1895.

Readers of SCIENCE who are interested in the matter of electric lighting from a practical standpoint will find much that is instructive in this paper recently printed in the Philosophical Magazine and published as a separate. For several years Professor Ayrton has been investigating the question of the economy of incandescent lighting and especially the behaviour of the glow-lamp under continuous use. Some of the earlier results of this investigation have been announced from time to time in the English journals, having been communicated by Professor Ayrton to the Physical Society of London. The present pamphlet contains some additions made in January, 1895, and from these additions it appears that the results previously obtained have not been entirely supported by subsequent tests. The principal result reached in these tests was the rather unexpected fact that the glow-lamps examined appeared to increase in effectiveness during the first 80 or