

the North of England mines, are to be added *Hydrobia*, *Bythinia*, *Lithoglyphus*, and *Pisidium*. Fish remains were often found. Under these peculiar circumstances, from mineral veins and fissures of different ages in the Carboniferous limestone, he had discovered the oldest known Mammalia, about thirty-two species of fish, and eight of Reptilia, the oldest land and fresh-water Mollusca, and numerous other remains, numbering in the whole about 267 species.

Mr. H. B. Brady, who had made a special examination of the Foraminifera discovered by Mr. Moore, referred to the great interest attaching to the genus *Involutina*, from the remarkable variety of form his series presented, which had not hitherto been recognized in connexion with the genus.

REVIEWS.

I.—MR. WATERHOUSE HAWKINS'S RESTORATIONS OF EXTINCT AMERICAN DINOSAURIA.

“THE Twelfth Annual Report of the Board of Commissioners of the Central Park (New York), for the year ending December 31, 1868,” gives an account of the progress in the construction and ornamentation of this well-designed and noble work, which is to comprehend all that is agreeable to the healthy recreation of the citizens and serviceable for their intellectual activity. The landscape-gardener, sculptor, and architect have already been successful in carrying out designs, both of high art and of picturesque rusticity. The Naturalist has his Zoological Garden, which is to be useful also to the Cattle-breeder and the Acclimatization Society. The Botanist, the Astronomer, and the Meteorologist are to find aids here in their researches. The Antiquary and Historian will find a Library and Museum. Nor is Geology lost sight of. The ground itself of the Park is not destitute of geological interest; for the labour of upwards of 200 rockmen and blasters,—required to quarry and cut for ponds, rivulets, and roads,—open out sections worth looking at; but the Commissioners determined to increase the value of the Park in an educational point of view by availing themselves of the scientific assistance of Mr. B. Waterhouse Hawkins, F.G.S., well known as the talented constructor of the restorations of Extinct Quadrupeds at the Crystal Palace, in modelling some of the great American creatures of bygone times, of natural size and in life-like form. This Report tells us of the already successful labours of Mr. B. W. Hawkins, in visiting the Museums at Washington, New Brunswick, Albany, New Haven, and Philadelphia, especially the latter, studying these “rich storehouses of fossil treasures, of special value for the purpose of illustrating the gigantic forms of life that originally inhabited this Continent,” and reproducing in iron, plaster, and such like materials, the wonderfully bizarre and, as it were, monstrous Dinosaurian forms, cousin-german to our Iguanodons, Hylæosaurs, Scelidosaurus, Megalosaurus, and other Mesozoic Reptiles.

Mr. Hawkins has chosen for his first American restorations *Hadro-*

sauros Foulkii (Leidy) and *Laelaps aquilunguis* (Cope). The former, set up as a perfect skeleton, nearly erect on its hind feet and tail-end but resting with its front paws against the upper boughs of a tree, presents a gigantic kangaroo-like outline, with a stature of about eighteen feet. It is characterized by its long, strong, many-jointed tail; its great, long, three-toed hind legs; its short, weak, four-toed front limbs, and its weird, turtle-like, big-eyed skull,—all shown, together with the Restorer, in the photograph at page 138 of this Report. The *Laelaps* figures, both in its fleshless erect skeleton (twenty feet high), and in its rehabilitated form, couchant, are shown in a lithograph opposite page 30. Its longer, hooked, and somewhat bird-like skull, distinguishes this from its brother monster.

The completion of the skeletons, by making good the broken parts, restoring bones of one side by reversed models from the opposite, and replacing strange bones aright in their relative positions, is no small task of science and art; but in setting these bones and joints in the varied conditions of rest and motion, and in covering them with their due envelopes of muscle and integument, the artistic naturalist has had a task equal to his best and boldest efforts; and he fully acknowledges, in his official letters in the Report, that he has worked on the excellent basis afforded by the scientific works of Leidy and Cope (enlightened moreover by Huxley's researches), and that he has throughout received the courteous and cordial co-operation of the savants of the United States. Not only must Mr. Hawkins be gratified in advancing the means of educational progress in America in thus adding to the resources of the Central Park, but he must feel great pleasure in putting bodily before our eyes the definite shapes and proportions of some of the great and long unknown reptilian masters of the world, whether dignified in their monstrous bulk and unused power as Herbivores, or domineering as the Carnivorous tyrants of their day. Showing us, too, how when they rose up like giants refreshed, to prowl among the marshes and mud-banks, or to feed on the dank jungles and marsh-plants, they either stalked erect with upraised head, combining the gait of Ostrich and Kangaroo, and leaving the bipedal trifold tracks so common in our Wealden strata;—or, crawling like a big-legged Labyrinthodont, or somewhat like the Kangaroo, prone on all fours, but making no great leaps, they left quadrupedal print-marks of unequal feet, as still seen in the older Connecticut Sandstone. How far, in other respects besides this upright gait and three-toed hind feet, these ornithico-saurian creatures resembled Birds, palæontologists are making it their study to determine.¹

We shall indeed look forward with pleasure for other results of Mr. Hawkins' scientific skill; and we shall be very glad to be able to congratulate the Commissioners of the Park on the advancement of all their good intentions and excellent plans for making the Park

¹ See Prof. Huxley's Memoir in the Popular Science Review, July, 1868, p. 237, and plates 27 and 28; also his Lecture, GEOL. MAG. Vol. V. p. 357.

not only an ornament to their great city, and a healthy recreation-ground to their fellow-citizens, but also a useful, good, and comprehensive educational institution to all who may visit it, gentle and simple, citizen and stranger. We must add that the statistics of the work done in the Park, of its visitors, and of other matters concerning it, speak clearly and satisfactorily of the well-being and advancement of the Americans, of their administrative powers, and of their knowledge of, and desire to do, whatever is likely to be beneficial to mankind at large, in "bringing to light new truths, stimulating the progress of invention, discovery, and commercial enterprise, no less than educational reform."—T. R. J.

II.—MEMOIRS OF THE GEOLOGICAL SURVEY OF IRELAND. EXPLANATION OF SHEET 105, ETC. DUBLIN, 1869.

THIS memoir, by Mr. G. H. Kinahan, on the geology of the district around Galway, possesses a melancholy interest in being, probably, the last of the published works of the Irish Survey, to which the late lamented Director affixed his signature. As will be seen by reference to the sheet (105), the entire district, with the exception of that portion occupied by surface deposits and the Carboniferous limestone, is composed of Igneous and Metamorphic rocks, and, therefore, possesses a special importance in a petrological and mineralogical point of view. The igneous rocks, described by the author, are coloured under three tints, respectively denoting, 1. Felstone, and porphyritic felstone; 2. Greenstone, or Diorite; 3. Granite, which last is divided into three subdivisions, viz.: Intrusive granite, foliated or stratified (?) granite, and porphyritic granite.

Commencing with the granite, a careful perusal of the Memoir, and an examination of the map itself, does not appear to warrant these subdivisions. In the first place, we can find no reason for considering the great mass of granite less intrusive than the small outlying bosses, which are expressly marked as intrusive, more especially since some parts of the great mass are also marked as intrusive, and no evidence is given which appears to justify the conclusion that this great continuous mass, and the other smaller masses, have more than one common origin; for this reason, therefore, notwithstanding Mr. Kinahan's somewhat elaborate attempt to infer such subdivisions, we are inclined to the opinion that the intrusive, foliated, and porphyritic granites form in depth but parts of one and the same mass. The statement (p. 7) that granite "becomes *Pegmatite* when *Scapolite* seems to replace part, or the whole of the felspar," will certainly not be accepted by Petrologists.

The remarks (p. 11) under the head of *Diabase* and *Diorite*, are so indefinite as to leave much doubt as to the real character of the rocks alluded to under these denominations. The observations made on the Gneiss of the district leaves an impression on the mind of the reader that the rocks, described under this name, are in reality only metamorphic schists further altered and rendered felspathic by