

Index to the Reports of the Chief of Engineers, U. S. A., 1880-1887. 622 pp.
The topography of Florida by N. S. Shaler, Bull. Mus. Comp. Zool., Cambridge,
vol. xvi. No. 7. 1890.

Studies on Lepidosteus, by E. L. Mark; 128 pp. 8vo, with nine fine plates.
Ibid., vol. xix, No. 1, 1890.

History of Niagara River, by G. K. Gilbert. 24 pp. 8vo. Ann. Rep. Comm.
State Reserv. Niagara for 1889.

Physical History of the Boston Basin, by W. O. Crosby. Boston, 1889.

Geology of the Lassen Peak District; by J. S. DILLER. 8th Ann. Rep. Direc-
tor U. S. Geol. Survey. 32 pp. large 8vo. 1889.

Fossil Butterflies of Florissant; by S. H. Scudder, ibid. 32 pp. 8vo. 1889.—
Mr. Scudder here describes and figures several new species, making the number
from Florissant seven, which is nearly half of all the fossil species known.

Annals of the Astronomical Observatory of Harvard College, Edward C. Pick-
ering, Director, vol. xxii: Meteorological Observations made on the summit of
Pike's Peak (the height 14,434 feet), Colorado, Jan., 1874, to Jan., 1888, under
the direction of the Chief Signal Officer, U. S. A., 476 pp. 4to.

Memoirs of the National Academy of Sciences.—Vol. iv; Part 2, just issued
contains Contributions to Meteorology by E. Loomis (pp. 7-79); on the determi-
nation of Elliptic Orbits from three observations, by J. Willard Gibbs; the tem-
perature of the moon, by S. P. Langley; the Lucayan Indians, by W. K. Brooks.

Bulletin of the American Museum of Natural History, Vol. II, Nos. 3, 4, con-
tains several papers on new or described mammals of America, by F. M. Chapman;
Birds and Mammals, by J. A. Allen; Mammals of New Mexico, by E. A. Mearns.

RICHARD OWEN.—Professor Richard Owen died suddenly, at
New Harmony, Indiana, on the 31st of March. He was born in
Lanarkshire, Scotland in 1810 and was nearly three years younger
than his brother, David Dale Owen, who died about 30 years
since. With his father and brother, he came to New Harmony
in 1828. He served under General Zachary Taylor, as captain in
the Mexican war, during the years 1847-48. In 1849 he joined
his brother in the geological survey of Minnesota, and also
became Professor of the Natural Sciences at Nashville; and
while there, in 1857, published "A Key to the Geology of the
Globe." In 1859, he was associated with his brother in the sur-
vey of Indiana, the report on which by him, appeared in 1862,
after the death of his brother, and also after his having joined in
the Civil War. During the year 1861, he was made Lieutenant
Colonel of the 15th Indiana Volunteers, and in the autumn of
that year colonel of the 60th regiment. In November of 1865 he
resigned his commission as colonel at New Iberia, Louisiana (as
stated in volume xlii of this Journal, 1866), and having heard of
the rock salt deposit of La Petite Anse, 12 miles distant, went
and investigated it, and made the first report on it to the
Academy of Sciences at St. Louis. In 1865, he became Professor
of the Natural Sciences in the Western Military Institute of Ken-
tucky (afterward, changed to the University of Nashville), and
held the position until the autumn of 1879. Professor Owen also
devoted himself in later years to meteorology.

Professor Owen's Key to the Geology of the Globe, of 1857,
exhibits the man in his science, which while practical, tended
strongly toward the speculative, and also in his relations to
young students, who, from his deep interest in them, drew out
some pages of advice on temperance and other virtues.

APPENDIX.

1890

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3rd. Ser.

Vol. 39

ART. LI.—*Distinctive Characters of the order Halloпода*;
by O. C. MARSH.

In 1877, the writer described a small reptile from the
Jurassic of Colorado, and referred it to the *Dinosauria*.* On
further investigation, it was found to be distinct from all the
known members of that group, and in 1881, it was made the
type of a new sub-order, the *Halloпода*.† One of the most
distinctive characters, which separated it widely from all
known Dinosaurs, was seen in the tarsus, which had the cal-
caneum much produced backward. This feature, in connection
with the greatly elongated metatarsals, suggested the generic
name *Halloпода*, or leaping foot.

The general structure of the pelvis, especially of the ilium
and pubis, as well as the proportions of the entire hind limb,
suggested an affinity with *Compsognathus*, from the Jurassic
of Bavaria, and the writer, in his classification of the Dino-
saur, in 1882, placed the *Halloпода* next to the sub-order
Compsognatha, which belongs in the great group of carnivorous
Dinosaurs, the *Theropoda*.‡

Quite recently, the writer has reëxamined the type specimen,
and had various parts of it uncovered, so far as the hard matrix
of red sandstone would permit. This has brought to light
other portions of the skeleton, so that now many of the more
important characters of the order can be determined with
certainty.

In its present condition, the specimen shows both the fore
and hind limbs in good preservation, portions of the scapular
arch, and apparently the entire pelvis, and sacrum, various
vertebræ, ribs, and other parts of the skeleton. It is at present
doubtful if any portions of the skull are sufficiently well
preserved for determination.

* This Journal, vol. xiv, p. 255, September, 1877.

† Ibid., vol. xxi, pp. 422, 423, May, 1881.

‡ Ibid., vol. xxiii, p. 85, January, 1882.

In size, the animal was about as large as a rabbit, but the fore limbs were proportionately much smaller. As the present specimen is the only one known, it is important to place on record its distinctive characters.

The scapula is of moderate length, and its upper portion broad and thin. The humerus is slender, with a strong radial crest. The shaft is very hollow, with thin walls, and the cavity extends almost to the distal end. The latter is but little expanded transversely. The radius and ulna are short, and were closely applied to each other. There were but four digits in the manus, the first being short and stout, and the others slender.

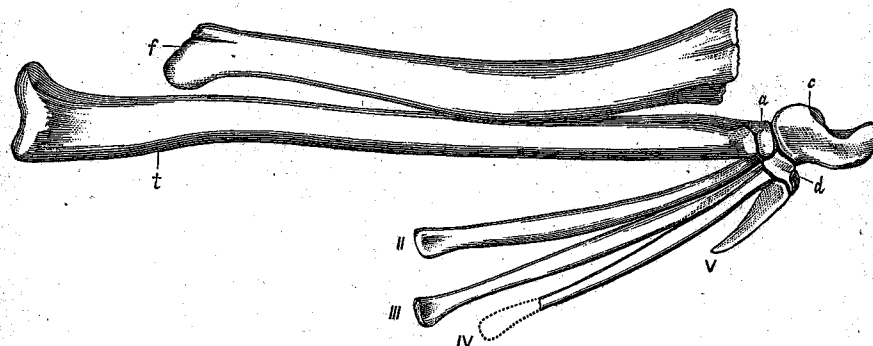
All three pelvic bones aided in forming the acetabulum, as in typical Dinosaurs. The ilia are of the carnivorous type, and resemble in form those of *Megalosaurus*. The pubes are rod-like, and projected downward and forward. The distal ends are closely applied to each other, but not materially expanded, and in the present specimen are not coössified with each other. The ischia projected downward and backward, and their distal extremities are expanded, somewhat as in the *Crocodylia*.

The femur is comparatively short, with the shaft curved and very hollow. The tibia is nearly straight, much longer than the femur, and its shaft equally hollow. The fibula was slender and complete, but tapered much from above downward. Its position was not in front of the tibia below, as in all known Dinosaurs, but its lower extremity was outside, and apparently somewhat behind, the tibia.

The astragalus is large, and covered the entire end of the tibia, but was not coössified with it. The calcaneum is compressed transversely, and much produced backward. It was closely applied to the outside of the astragalus, and although agreeing in general form with that of a crocodile, strongly resembles the corresponding bone in some mammals. The tarsal joint was below the astragalus and calcaneum. There appears to be but a single bone in the second tarsal row, although this may be composed of two or more elements.

There were but three functional digits in the hind foot, and their metatarsals are greatly elongated. The first digit was entirely wanting, and the fifth is represented only by a remnant of the metatarsal. The posterior limbs, as a whole, were especially adapted for leaping, and are more slender than in almost any other known reptile.

The main characters of the posterior limbs are shown in the figure below, which represents the bones of the left leg and foot, natural size, in the position in which they lay when uncovered. All the bones figured are still firmly embedded in the matrix.



Left leg and foot of *Hallopus victor*, Marsh; natural size; side view. a, astragalus; c, calcaneum; d, tarsal; f, femur; t, tibia; II, second metatarsal; V, remnant of fifth metatarsal.

There are but two vertebræ in the sacrum. The other vertebræ preserved have their articular faces bi-concave. The chevrons are slender and very elongate.

Taken together, the known characters of *Hallopus* indicate Dinosaurian affinities rather than those of any other group of reptiles, and if the *Dinosauria* are considered a sub-class, the *Hallopoda* at present may be regarded as an order of Dinosaurs standing more apart from typical forms than any other.

The characters which now indicate the position of the *Hallopoda* among the *Reptilia*, living and extinct, are given below. The discovery of more perfect specimens, however, especially of the skull, must be awaited before their nearer affinities can be determined.

DINOSAURIA ?

Order HALLOPODA (Leaping Foot). Carnivorous.

Feet digitigrade, unguiculate. Fore limbs very small, with four digits in manus. Hind limbs very long, with three digits in pes, and metatarsals greatly elongated. Calcaneum much produced backward. Vertebræ and limb bones hollow. Two vertebræ in sacrum. Acetabulum formed by ilium, pubis, and ischium. Pubes rod-like, projecting downward, but not coössified distally. No post-pubis. Ischia with distal ends expanded, meeting below on median line.

New Haven, Conn., April 21st, 1890.