

microscopic examination; and it was figured in the *American Naturalist* of September 1888.

G. MACLOSKE.

Princeton University, U.S.A., March 24.

The Affinities of "Hesperornis."

IN the autumn of 1870, I discovered, in the Cretaceous of Western Kansas, the remains of a very large swimming-bird, which in many respects is the most interesting member of the class hitherto found, living or extinct. During the following year, other specimens were obtained in the same region, and one of them—a nearly perfect skeleton—I named *Hesperornis regalis*.¹ In subsequent careful researches, extending over several years, I secured various other specimens in fine preservation, from the same horizon and the same general region, and thus was enabled to make a systematic investigation of the structure and affinities of the remarkable group of birds of which *Hesperornis* is the type. The results of this and other researches were brought together in 1880, in an illustrated monograph.²

In the concluding chapter on *Hesperornis*, I discussed the affinities of this genus, based upon a careful study of all the known remains. Especial attention was devoted to the skull and scapular arch, which showed struthious features, and these were duly weighed against the more apparent characters of the hind limbs, that strongly resembled those of modern diving birds, thus suggesting a near relationship to this group, of which *Colymbus* is a type. In summing up the case, I decided in favour of the ostrich features, and recorded this opinion as follows:—

"The struthious characters, seen in *Hesperornis*, should probably be regarded as evidence of real affinity; and in this case *Hesperornis* would be essentially a carnivorous, swimming ostrich" ("Odontornithes," p. 114).

This conclusion, a result of nearly ten years' exploration and study, based upon a large number of very perfect specimens, and a comparison with many recent and extinct birds, did not meet with general acceptance. Various authors, who had not seen the original specimens, or made a special study of any allied forms, seem to have accepted without hesitation the strikingly adaptive characters of the posterior limbs as the key to real affinities, and likewise put this opinion on record. The compilers of such knowledge followed suit, and before long the Ratite affinities of *Hesperornis* were seldom alluded to in scientific literature.

Several times I was much tempted to set the matter right, as far as possible, by reminding the critics that they had overlooked important points in the argument, and that new evidence brought to light, although not conclusive, tended to support my original conclusion that *Hesperornis* was essentially a swimming ostrich, while its resemblance to modern diving birds was based upon adaptive characters. On reflection, however, I concluded that such a statement would doubtless lead to useless discussion, especially on the part of those who had no new facts to offer, and, having myself more important work on hand, I remained silent, leaving to future discoveries the final decision of the question at issue.

It is an interesting fact that this decision is now on record. A quarter of a century after the discovery of *Hesperornis*, and a decade and a half after its biography was written in the "Odontornithes," its true affinities, as recorded in that volume, are now confirmed beyond dispute. In the same region where the type specimen was discovered, a remarkably perfect *Hesperornis*, with feathers in place, has been found, and these feathers are the typical plumage of an ostrich.³

O. C. MARSH.

Yale University, New Haven, Conn., March 16.

The Antiquity of Certain Curved Knives.

IN the United States National Museum are a number of knives which go by the general name of "curved knives." The figure here shown is from Anderson River, Mackenzie River district, and is an exaggerated form of the implement mentioned. The essential features are a blade curving upward, so that in

¹ *American Journal of Science*, vol. iii. p. 56, January; and p. 360, May 1872.

² "Odontornithes: a Monograph on the Extinct Toothed Birds of North America." 4to. 34 plates, Washington, 1880.

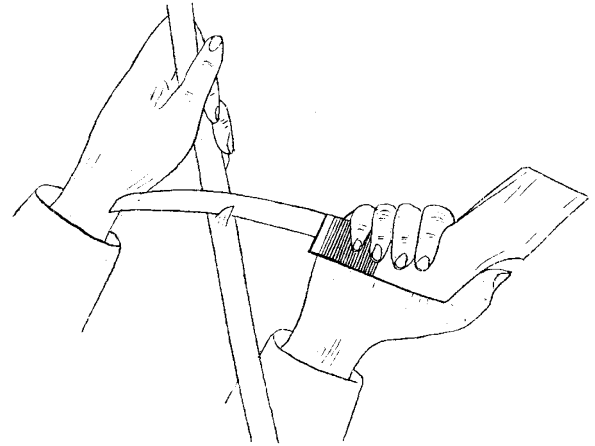
³ Williston, *Kansas University Quarterly*, vol. v. p. 53, July 1896.

NO. 1432, VOL. 55]

cutting it is moved towards the body, and not away from it as in ordinary whittling; this blade is fastened to a handle which is grasped by the four fingers, the thumb resting in a bevel at the butt end. The Canadian voyager uses this knife in making snow-shoes, canoes, and in wood-working generally.

Somewhat modified specimens come from Alaska, wherever drift wood is utilised by the natives in making household and other utensils, and from the Pacific Coast of North America. The same form is found in abundance along the eastern coast of Asia, as far south as further India. The "farrier's knife" of England is formed and used on the same principle.

I am very curious to know the antiquity of this form of knife, and to find out the earliest date when it was introduced into America. I am not familiar with any examples from southern Europe, although, anciently, this pattern may have entered into the common mechanical life of people there.



In connection with this knife, it is pleasant to know that, while a great multitude of aboriginal arts have been degraded by contact with the white race, wherever this knife has gone the savage art has been greatly improved and perfected.

The primitive and old-fashioned snow-shoe, with a rough stick bent into pear-shape for the frame, the filling being of the coarsest raw hide, must be compared with the delicately made frame and fine and uniform babiche of the modern snow-shoe, to give force to this declaration.

I am making a collection of knives of this class, together with information concerning their distribution, forms and uses.

U. S. National Museum.

OTIS T. MASON.

The Function of Disease in the Struggle for Existence.

PROF. A. DE QUATREFAGES ("The Human Species," p. 430), discussing the decline of the Polynesian Races, remarks:—"Two naval surgeons, M.M. Bourgarel and Brulfert, have alone been able to throw some light upon this melancholy problem. The former found that tubercles were *invariably* present in the lungs of bodies submitted to post-mortem examination. The latter tells us that all Polynesians suffer from an obstinate cough, and that, in eight cases out of ten, tuberculosis follows these bronchial catarrhs. Now, phthisis does not appear in the list of diseases drawn up by the old voyagers."

As is well known, the climate of New Mexico is extremely unfavourable to the development of pulmonary tubercle, and consequently this disease seems to have been formerly absent among the native Mexicans. But I have been informed that Mexican girls serving in houses where there are consumptive invalids sometimes contract phthisis, which, in this climate, must indicate a high degree of constitutional susceptibility. *Per contra*, the Mexicans appear to survive small-pox more easily than Europeans, if not also more immune from its attacks, and this, doubtless, may be explained by the fact that they take no precautions to avoid it, and consequently allow selection by disease full play, as was suggested to me by Dr. Lyon, of Las Cruces.