

offers a substantial barrier of hard limestone to such an amount of erosion on the part of the glacier. Furthermore, the gradients of the lower courses of some of the streams, at least, such as A, F and D, where the streams are still flowing through till must have been formed prior to the presence of the glacier since they are partly plugged with glacial debris. It seems likely, then, on the whole, that these streams had cut to grade not long prior to the glacial epoch and were rejuvenated together with the entire Mohawk system by the elevation which preceded or accompanied the glacial epoch.

SKULL OF FOSSIL BISON.

BY W. G. MIDDLETON AND JOSEPH MOORE.

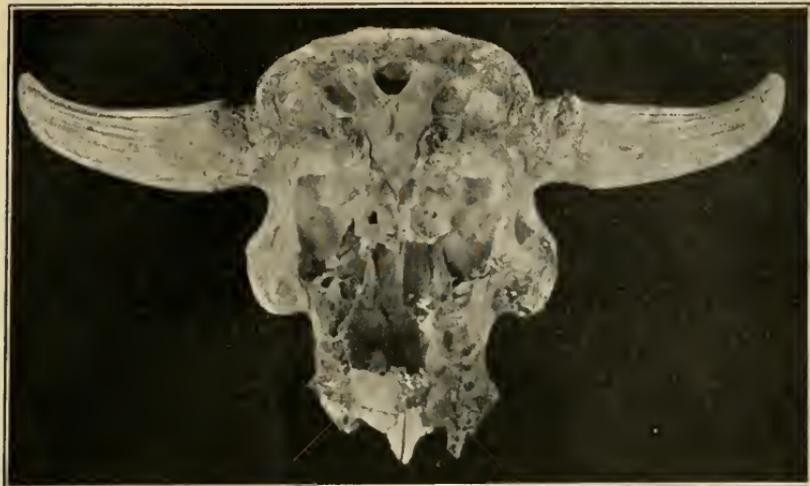
Let it be said here, by way of introduction, that Mr. Middleton, of the Vincennes High School, as some members of the Academy will remember, obtained and reported to the late meeting the above-named specimen, reporting it as probably *Bison latifrons*, Leidy. Mr. Middleton gave his report verbally to the Academy, and has recently been in poor health, so that he has not been able to give it further study and write it up for publication. He, therefore, requests me (J. M.), since the specimen has been sent to Earlham College, to forward measurements, photographs and whatever notes may seem proper.

This cranium was found in 1896, a few miles from the city of Vincennes, Indiana, by a Mr. Brower. It was some six feet below the surface, partly unearthed by the caving in of the bank of a deep ditch.

It will be noted that what appears to be the horns are but the horn cores—processes of the frontal bones for the support of horns long since decayed. The horns, if restored, would add, say a foot to each projection.

	Ft.	In.
Distance from tip to tip of horn cores, direct line.....	3	0 *
Circumference of horn cores near base.....	1	0
From tip to tip of horn cores, line of outer curves.....	3	9
Width of forehead between horns.....	1	3
Greatest width from outer to outer of orbit borders.....	1	2½
Least width of forehead (between eyes and horns).....	1	½
Length of face from occipital crest to anterior of nasals..	1	9

* This measurement supposes an inch, more or less, to be restored to the tip of the right horn core, which has been broken off. Measurement as it appears in the cut is 35 inches.



BASAL AND OCCIPITAL VIEW.



FRONT VIEW.



POSTERIOR VIEW.

(It will be noted that the premaxillaries and a portion of the maxillaries are wanting. With these restored the face would be six to eight inches longer.)

	Ft.	In.
Greatest width of occiput, right and left.....	1	½
Greatest width of occipital condyles, right and left.....	0	5½

The horn cores at base are warty and spurred; throughout their length they are ridged and grooved.

A cross section of these cores at almost any point would give, approximately, a circle having an irregularly notched border.

The face is slightly depressed between the eyes, but the forehead above the eyes is moderately convex, both vertically and crosswise. This latter feature is the more marked immediately below the occipital crest.

The cranial cavity is perfect; so are the zygomatic arches. The maxillaries, as will be seen from photograph No. 2, are quite defective. The left maxillary has two fragmental grinders, second and third, numbering from behind.

We have called this a Fossil Bison, but the fact that it was found several feet below the surface does not, of itself, prove it to represent a species different from the ordinary recent (though almost extinct) "buffalo"—*Bison bison*. Remains of our recent bison have many times been found in peat, loam, loess and in ordinary marsh ground.

This specimen from Vincennes bears a close resemblance to the modern buffalo in many details, and yet it is evidently specifically different.

Prof. F. A. Lucas, of the U. S. National Museum, in his Memoir on the Fossil Bison of North America, describes the following six species—*B. occidentalis*, *B. antiquus*, *B. crassicornis*, *B. alleni*, *B. ferox*, and *B. latifrons*. This Vincennes specimen is *not* *B. latifrons*, as we suggested at the meeting of the Academy, as is clearly ascertained from further study and comparison.

From the size (and this is evidently a well-matured skull), from the length, diameter, direction, curvature and taper of the horn cores, we announce it, somewhat cautiously, as *B. antiquus* Leidy. In all of the above named particulars, and others we might name, it agrees much more nearly with said species than with our living bison.

Remains of *B. antiquus* have heretofore been found in two localities in California and at Big Bone Lick in Kentucky.

Fragments of fossil bison and allied forms have for a century, more or less, been called in a general way remains of a great American ox.

The accompanying plates, with the measurements, will aid the reader as to the size and form of the cranium we are studying. We are indebted to Prof. R. W. Barrett for photographs, also to Dr. J. Lindahl, of Cincinnati, for photographs of *B. latifrons* for comparison.

