The PLASTER JACKET is a newsletter about fossil vertebrate animals of Florida. Its purpose is to circulate authoritative material on vertebrate paleontology and to foster communication among the growing number of enthusiasts of this subject.

Questions, announcements and other communications are solicited from all readers. Information of general interest will be included in future issues.

It is our intent to produce this series at the rate of about one issue per quarter year. We hope to add as many genuinely interested paleontologists as possible to our mailing list. If you are interested please send your name and address to the PLASTER JACKET. These issues are distributed free of charge to all interested people.

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Florida State Museum
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Gainesville, Fla. 32601

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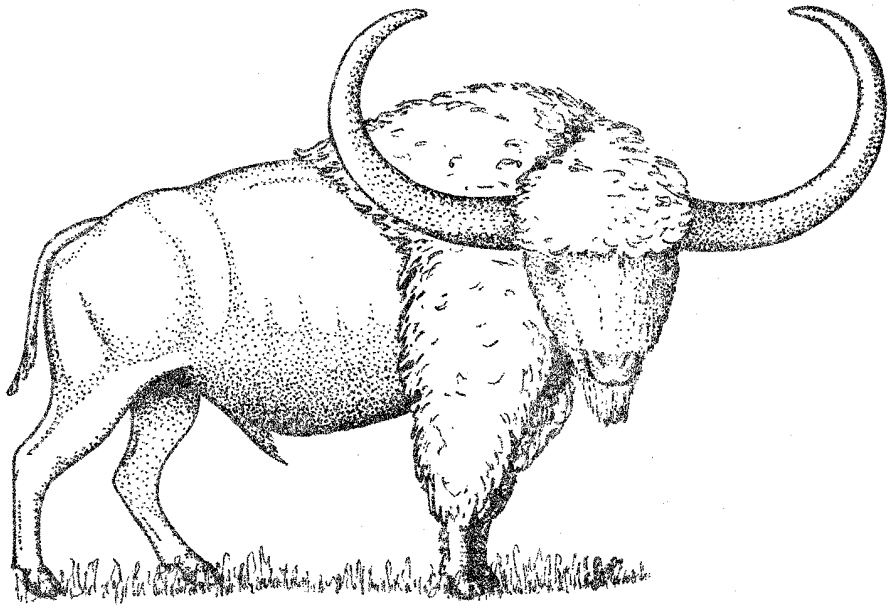
--about fossil vertebrates of Florida



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FOSSIL *BISON* FROM FLORIDA

Jesse S. Robertson

The genus *Bison* contains only two living species: *B. bonasus*, the Old World buffalo or wisent, and *B. bison*, the American bison or buffalo. Many fossil species have been named, but only a few are now generally regarded as valid. The most useful parts of the skeletal structure for species identification are the horn cores, which are outgrowths of the frontal bone, but the horn cores of any one species are extremely variable, especially between the sexes, and variants of a single species have no doubt been described as new species.

In North America the fossil and recent species may be divided into three groups, based on horn-core length (Table 1). The large-horned varieties (Group I) appear first in the fossil record, followed by the intermediate-horned types (Group II) and finally by the small-horned forms (Group III). This sequence shows that the trend in *Bison* evolution in North America has been toward reduction in horn size.

The members of group I migrated to North America from Asia by way of the Bering Strait and extended their range over the entire continent in the Rancholabrean (late Pleistocene). They were similar in appearance to the living *Bison* except for greater body size, a larger hump above the shoulders, and gigantic horns spanning more than 6 feet. The muscles necessary to support the extremely large and heavy horns were accommodated by the very high neural spines of the thoracic vertebrae (Fig. 1). The hump is made up of these spines, the attached muscles, and a variable surface covering of fat and skin. These large-horned animals were probably the ancestors of the members of group II, which were also widespread in North America. The only difference between the members of group I and those of group II is a reduction in horn size.

Detailed evidence shows that the members of group III evolved from those of group II. In certain sequences in the Western United States *B. antiquus* demonstrably grades into *B. bison*. *B. antiquus* is placed in both groups to emphasize this gradational change. *B. occidentalis* also appears in both groups as this species is known from Sub-Recent as well as late Pleistocene deposits. The morphological changes leading to the living species involve a further reduction of horn and hump size, as well as a decrease in overall body size. The surviving North American species is the smallest of all the *Bison*. Although the living *Bison* is generally regarded as a resident of the Western United States, its presence in Florida, as in other parts of Eastern United States, was recorded by many early explorers (see *The Geographic Range of the Historic Bison in the Southeast* by Eric Rostlund, Annals of the Association of American Geographers, vol. 50, no. 4, 1960).

One species from each of the above mentioned groups was present in Florida. *B. latifrons* (Fig. 2a, b) is known from several early Rancholabrean (late Pleistocene) terrestrial deposits in Florida. Three nearly complete skeletons and several isolated horn-cores have been found. The skeletons had been little disturbed since the time of death. In one instance (at Haile 8A in Alachua Co.) the animal had fallen through the roof of a cave and was preserved in his entirety in a trap of its own making. Finds like these are rare, however, and most of the fossil *Bison* material from Florida consists of isolated teeth and limb-bones.

A partial associated skeleton and several skulls of *B. antiquus* (Fig. 2c, d) have been taken from north Florida rivers. The associated skeleton was in place on the Santa Fe River bottom. Although river specimens are not usually associated, a lack of duplication of elements, as well as the extremely close agreement in measurements of left and right elements, is convincing evidence that these bones belonged to

teeth and postcranial material from Florida probably belong to Bison antiquus.

Remains of B. bison (Fig. 2e, f) are very rare in Florida. One horn-core was collected from a north Florida river, and several teeth and postcranial elements have been found in Indian mounds throughout the state.

IDENTIFICATION OF FOSSIL BISON

Bison teeth are often confused with those of various camels found in Florida. The upper and lower molars of Bison have the accessory pillar characteristic of the family Bovidae (Fig. 3), whereas most camel teeth (and all Pleistocene ones) do not. Once the familial identification has been established, the genus can be determined by tooth size and enamel pattern (Fig. 4). Postcranial material can be distinguished from Camelids and other Bovids by key osteological characters and size (Fig. 5).

Positive identification of Bison species from material other than horn cores and thoracic vertebrae has not been possible to date. Therefore isolated teeth and postcranial elements (which represent the bulk of the known material) can only be labeled "Bison sp." Unfortunately the literature is full of attempted species identifications that actually are largely guesswork, often based on preconceived ideas of the age of the material.

Isolated teeth and postcranial material of the living species can be identified by their significantly smaller size, but at this point a further problem is encountered. The postcranial skeletons of cattle (Bos) are almost identical with those of B. bison. Only by a great deal of study and comparison can these be separated (see Post-cranial characteristics of Bison and Bos, by Stanley J. Olsen, Papers of the Peabody Museum of Archeology and Ethnology, Harvard Univ., vol. XXXV, no. 4, 1960).

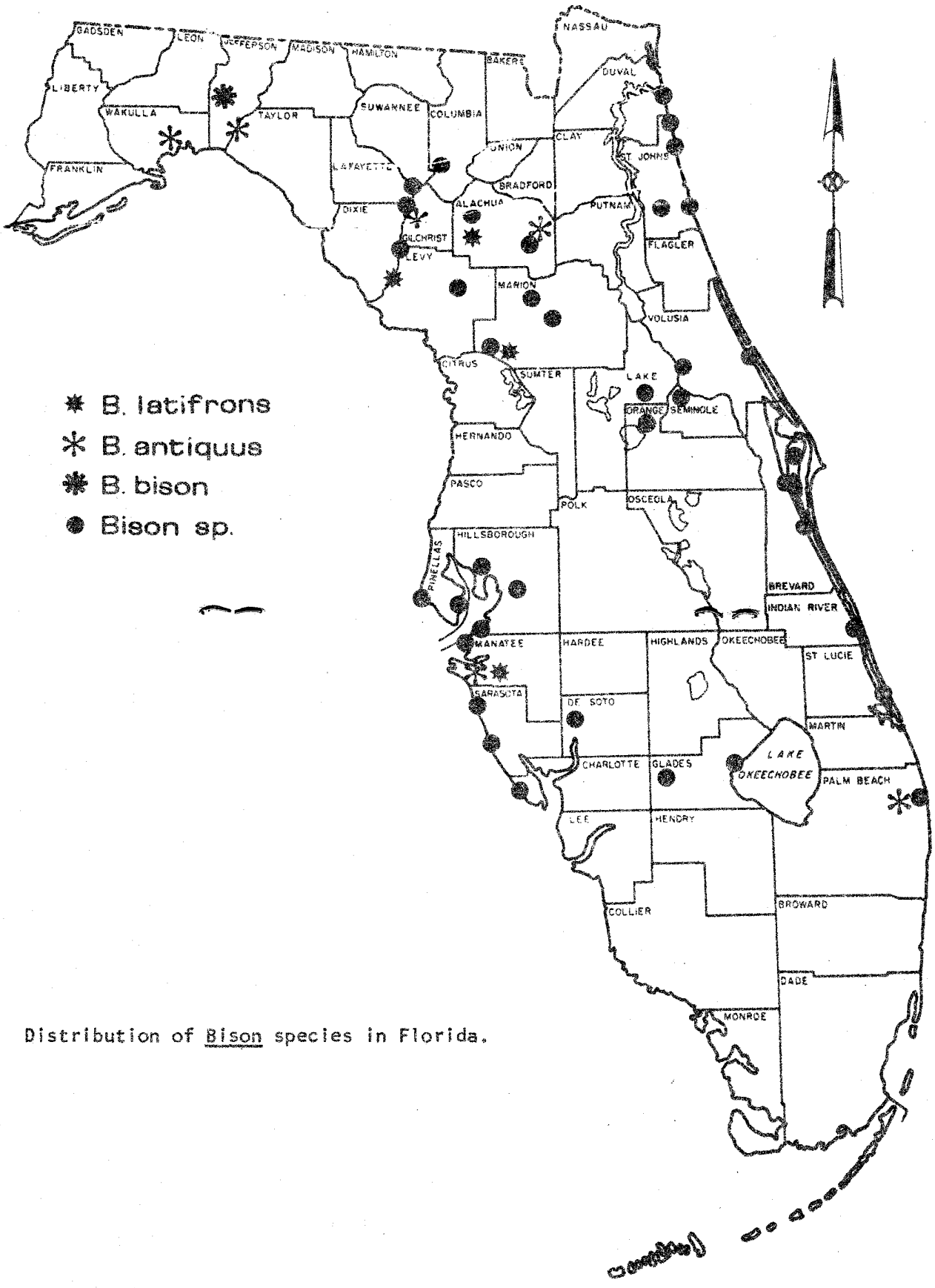
If the horn-cores are present, a secure species allocation can usually be made. For the known species of Florida this simple, as only one species is known from each of the three groups. If it is suspected that a fossil represents a species not previously reported from Florida, the characteristics of the horn-cores of all North American species can be found in: The Fossil Bison of Alaska and Preliminary Revision of the Genus, by Morris Skinner and Ove Kaisen, Bulletin of the American Museum of Natural History, Vol. 89, Article 3, 1947.

For the distribution of fossil Bison species which have occurred in Florida see centerfold map.

TABLE 1.-- Age and Horn-core Length of North American Bison.

Time	Species	Average Core Length[1]
Group I		
Early Rancholabrean	B. latifrons	1758
	B. alleni	1209
Group II		
Late Rancholabrean	B. alaskensis	1115
	B. chaneyi	1071
	B. crassicornis	963
	B. preoccidentalis	925
	B. antiquus	881
	B. geisti	810
	B. occidentalis	741
Group III		
Sub-Recent to Recent	B. antiquus	881
	B. occidentalis	741
	B. bison	541

[1] Horn-core measurements in millimeters from Skinner and



Distribution of Bison species in Florida.

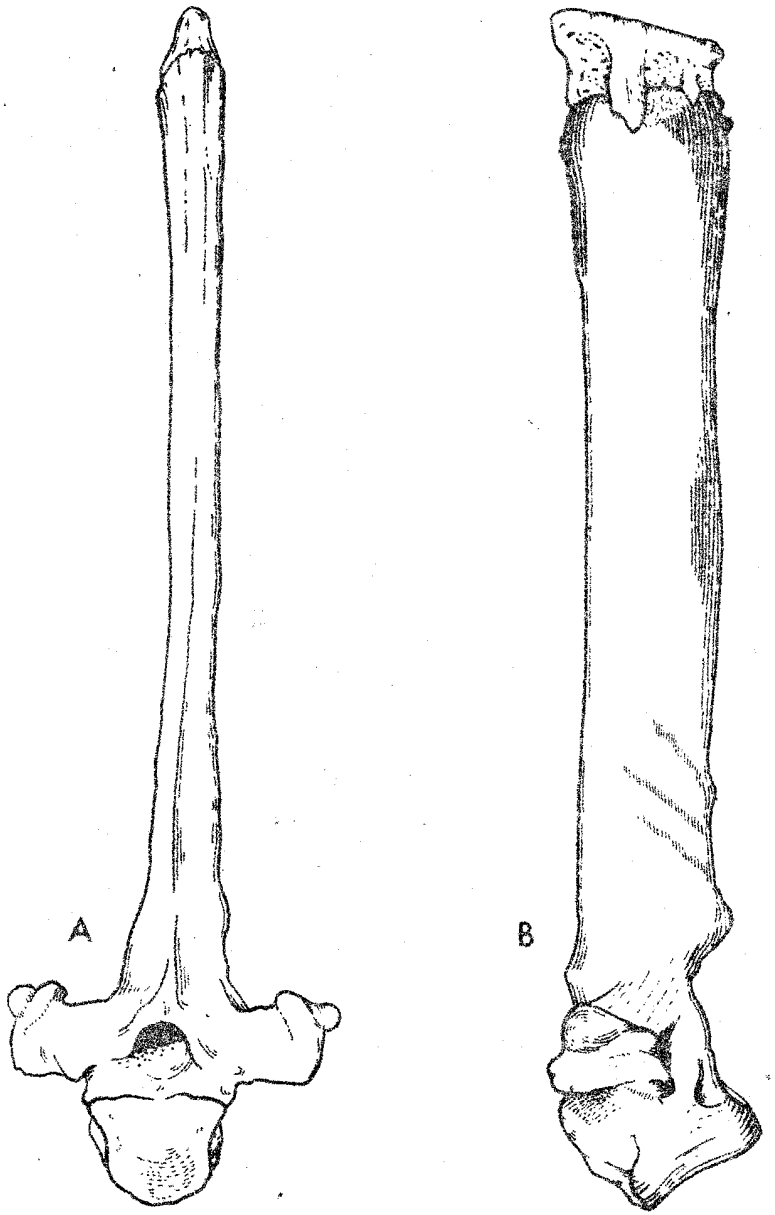


FIGURE 1. Thoracic vertebrae of Bison latifrons. A) Anterior view. B) Lateral view.

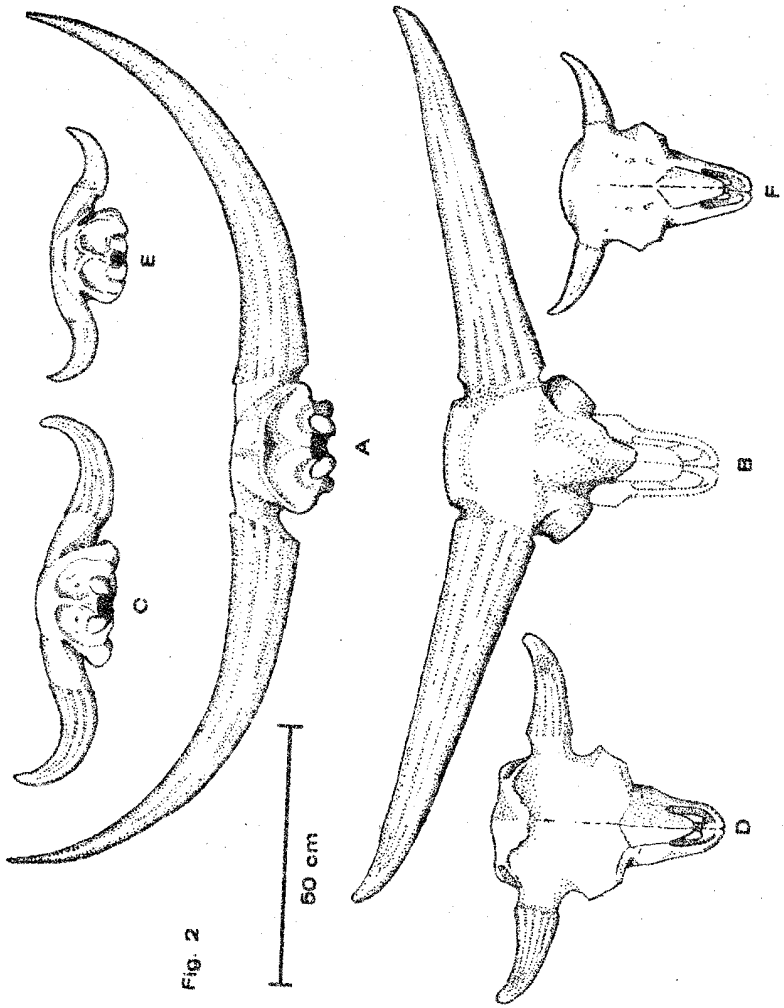


Figure 2. A) B. latifrons skull, posterior view; B) Same skull, frontal view; C) B. antiquus skull, posterior view; D) Same skull, frontal view; E) B. bison skull, posterior view; F) Same skull, frontal view.

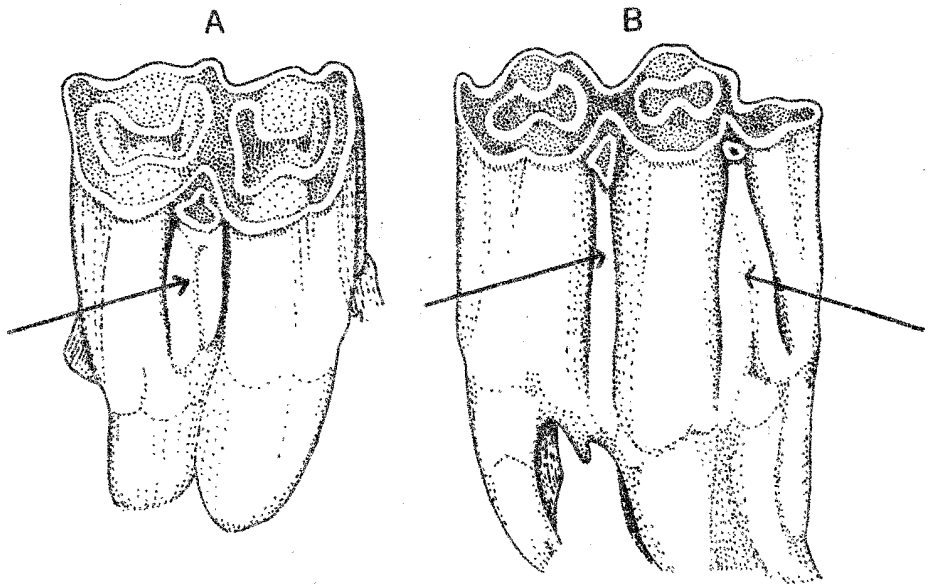


Figure 3. A) Bison upper molar; B) Bison lower molar. Arrows indicate accessory pillar.

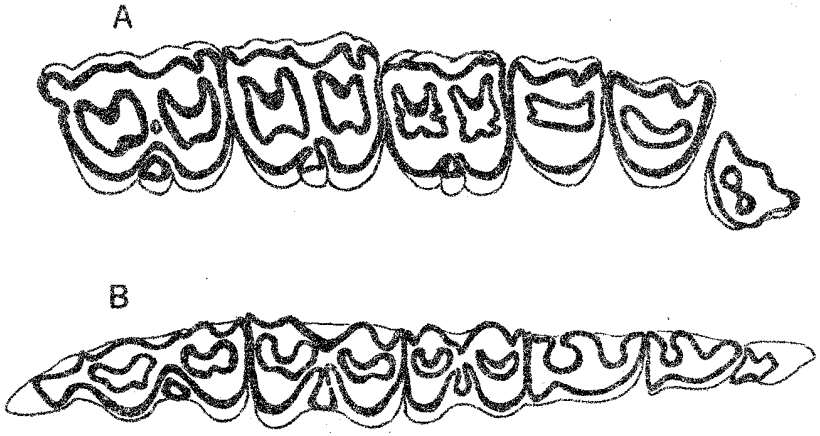


Figure 4. Tooth enamel patterns of Bison. A) Upper teeth; B) Lower teeth.

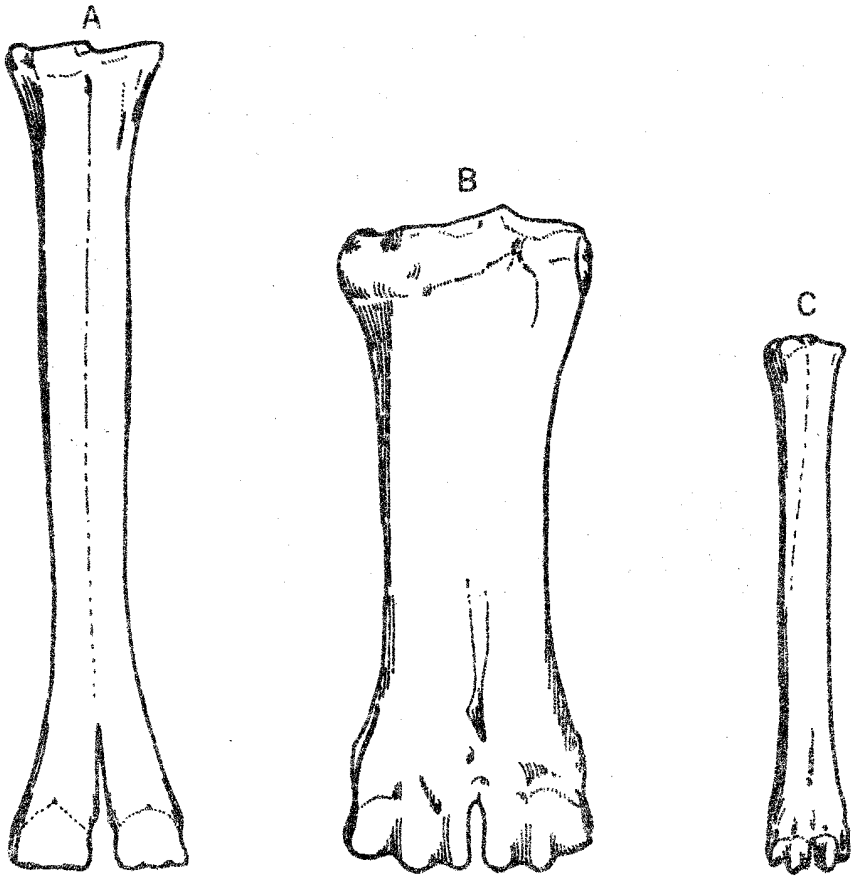


Figure 5. Metacarpals of various artiodactyls. A) Camel; B) Bison; and C) Deer.

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