EXPLANATION OF PLATES

Plate I.

Map showing localities in Iowa where vertebrate fossils have been found; also localities where have been observed exposures of interglacial deposits, except of loess. See pages 52-87.

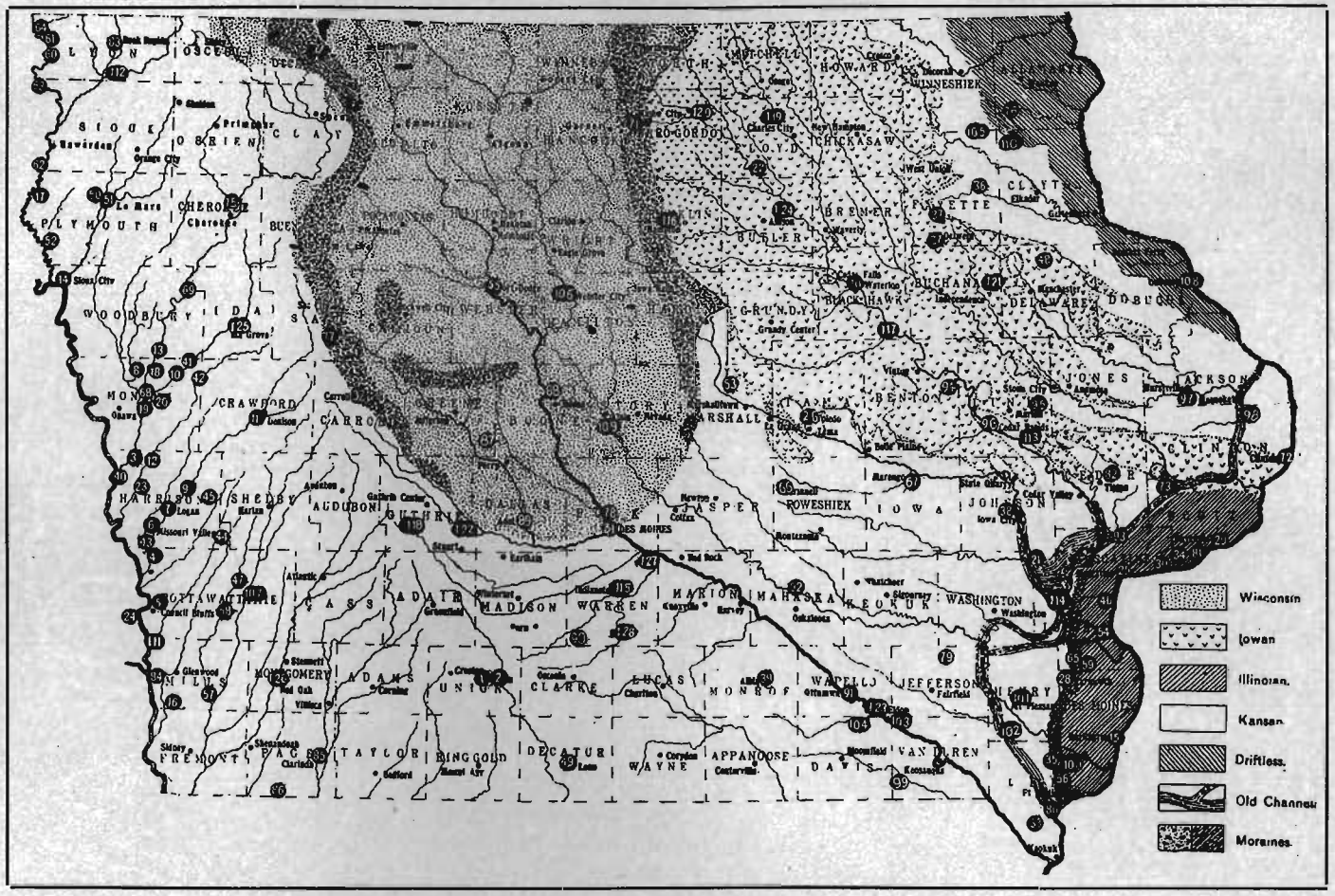
Wisconsin
Iowan
Illinoian
Kansan
Driftless
Old Channel
Moraines

Plate II.

This map is intended to show the localities where remains of extinct Edentata have been found in Pleistocene deposits. The numbers given correspond to those within the black circles of the map. Only generic names are given.

1. Megalonyx; Greenbrier county, West Virginia. 2. Megalonyx; Memphis, Tennessee. 3. Megalonyx and Mylodon; Big Bone Lick, Boone county, Kentucky. 4. Megalonyx; White county, Tennessee. 5. Megalonyx, Mylodon and Ereptodon; Natchez, Mississippi. 6. Megalonyx; Tuscumbia, Alabama. 7. Megalonyx; Henderson, Kentucky. 8. Mylodon and Megatherium; Charleston, South Carolina. 9. Mylodon; Lane county, Oregon. 10. Mylodon and Megatherium?; Benton county, Missouri. 11. Megatherium; Brunswick, Georgia. 12. Megalonyx; Hardin county, Texas. 13. Megatherium; 50 miles above mouth of Brazos river, Texas. 14. Megalonyx; Holmes county, Ohio. 15. Megalonyx; Wythe county, Virginia. 16. Megalonyx; McPherson county, Kansas. 17. Megalonyx and Mylodon; Port Kennedy cave, Montgomery county, Pennsylvania. 18. Megalonyx; Galena, Illinois. 19. Megalonyx, Glyptodon, and Chlamytherium; Peace creek, Florida. 20. Mylodon; New Iberia, Louisiana. 21. Megalonyx; Dubuque, Iowa. 22. Megalonyx; Clark or Meade county, Kansas. 23. Mylodon; Seneca, Nemaha county, Nebraska. 24. Mylodon and Paramylodon; Sheridan county, Nebraska. 25. Megalonyx; Mills county, Iowa. 26. Mylodon; Harrison county, Iowa. 27. Mylodon; Huerfano county, Colorado. 28. Mylodon; Fossil Lake, Oregon. 29. Morotherium; Owyhee county, Idaho. 30. Megatherium; Archer county, Florida. 31. Glyptodon; Nueces county, Texas. 32. Mylodon; Washtucna Lake, Washington State. 33. Megalonyx; Calaveras county, California. 34. Megalonyx; Shasta county, California. 35. Morotherium; Contra Costa county, California. 36. Morotherium; Marin county, California. 37. Mylodon?; Austin county, Texas. 38.

Mylodon; Lookout Mountain, Tennessee. 39. Megalonyx; Evansville, Indiana. 40. Morotherium; Almeda county, California. 41. Megalonyx; Blair county, Pennsylvania. 42. Mylodon; Savannah, Georgia. 43. Mylodon; Yamhill county, Oregon. 44. Megalonyx, Paramylodon, and Nothrotherium; Los Angeles county, California. 45. Megatherium; Brazos county, Texas. 46. Megalonyx; Hidalgo Falls, Brazos county, Texas. 47. Megalonyx; Champaign county, Illinois. 48. Mylodon; Tecumseh, Nebraska. 49. Megalonyx; Otoe county, Nebraska. 50. Megalonyx; Stanley county, South Dakota. 51. Megalonyx; Sioux City, Iowa. 52. Megalonyx; Monona county, Iowa. 53. Mylodon; Blue Lick Springs, Kentucky. 54. Megalonyx; Kimmswick, Missouri. 55. Megalonyx; Douglas City, California. 56. Megalonyx; Plymouth county, Iowa. 57. Megalonyx; Huron county, Ohio.

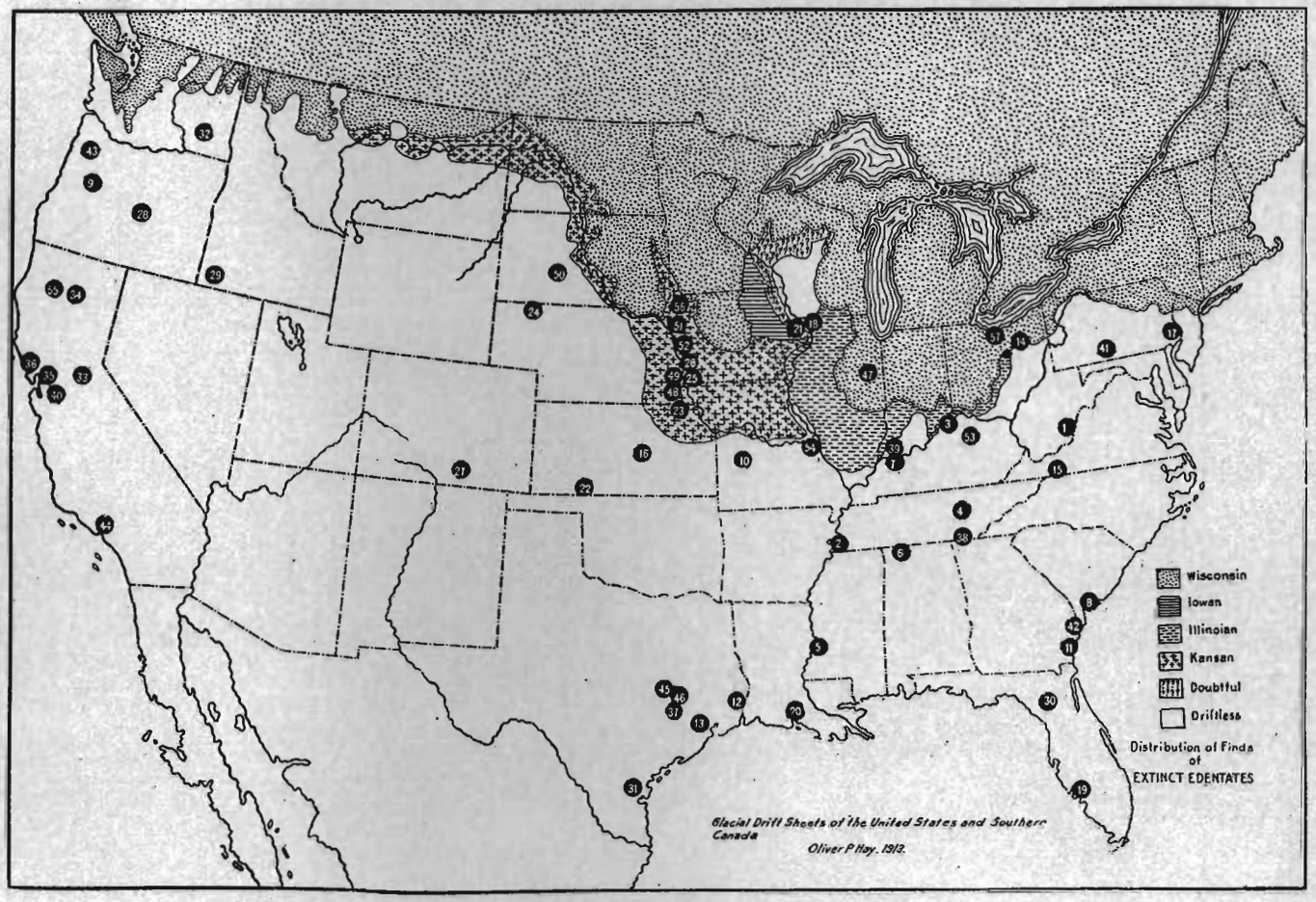
Wisconsin
Iowan
Illinoian
Kansan
Doubtful
Driftless
Distribution of Finds of EXTINCT EDENTATES
Glacial Drift Sheets of the United States and Southern Canada
Oliver P Hay. 1913.

Plate III.

Fig. 1. *Megalonyx leidyi.* Skull, seen from the right side. x 1/5. After Lindahl.....p. 113

Figs. 2-7. *Megalonyx jeffersonii.* Various parts.

2. Skull, seen from front. x 1/3. After Leidy...p. 115
3. Canine tooth. x .7. After Leidy.....p. 114
4. Same tooth, grinding surface. x .7. After Leidy .....p. 114
5. Claw found near Champaign, Illinois. x 3/5...p. 129
6. Same claw seen from above. x 3/5.....p. 129
7. Tibia and calcaneum, from behind. x about 1/12. From photograph of Henderson specimen .....pp. 124, 126

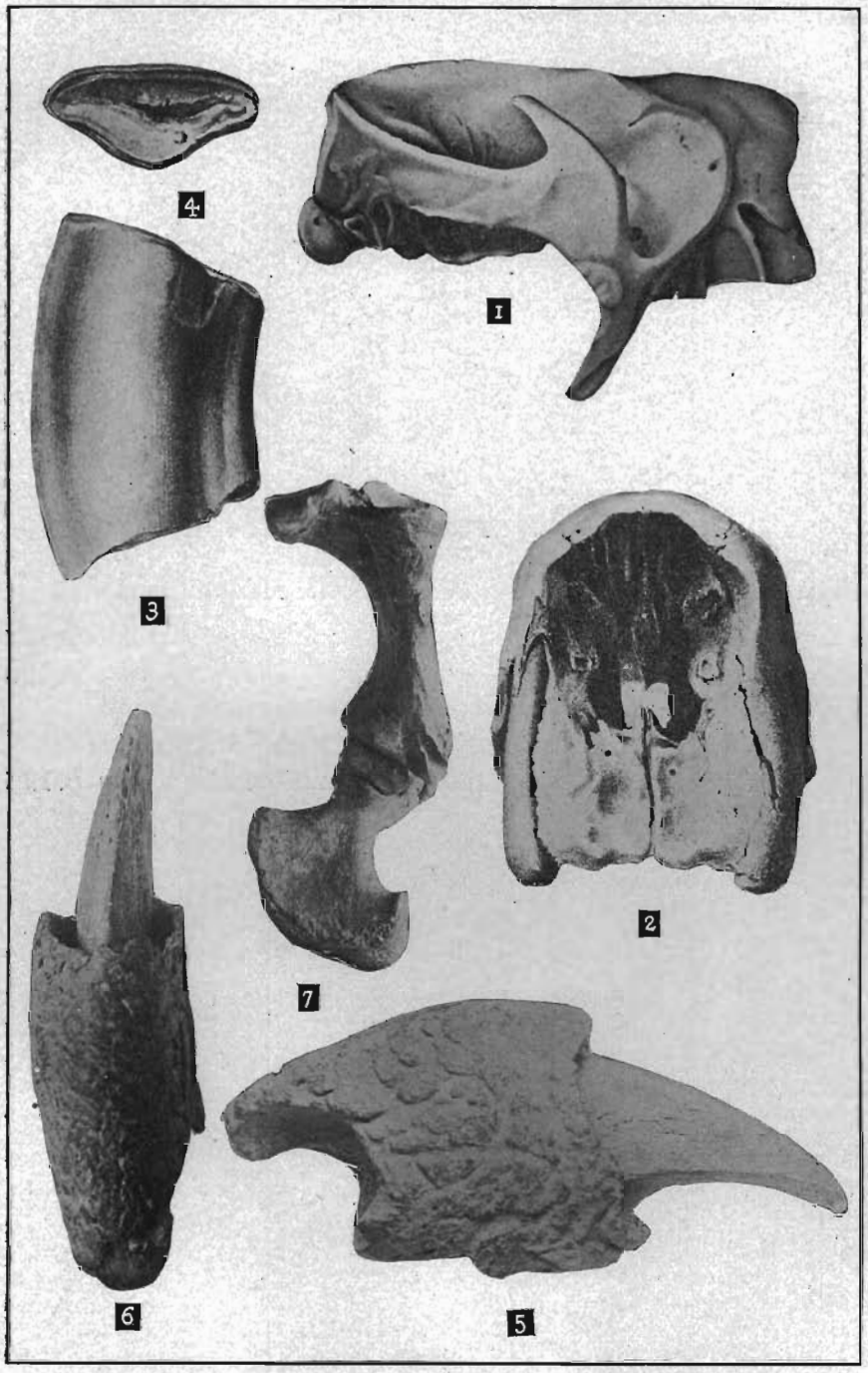
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Plate IV.

Figs. 1,2. Hapalops. After W. B. Scott. Much reduced.

1. Fore foot ..... p. 122
2. Hind foot ..... p. 126

Fig. 3. *Megalonyx jeffersonii.* Metatarsals. x .35. After Leidy. Numerals 2 and 5 over this figure indicate the second and the fifth digits. p. 126

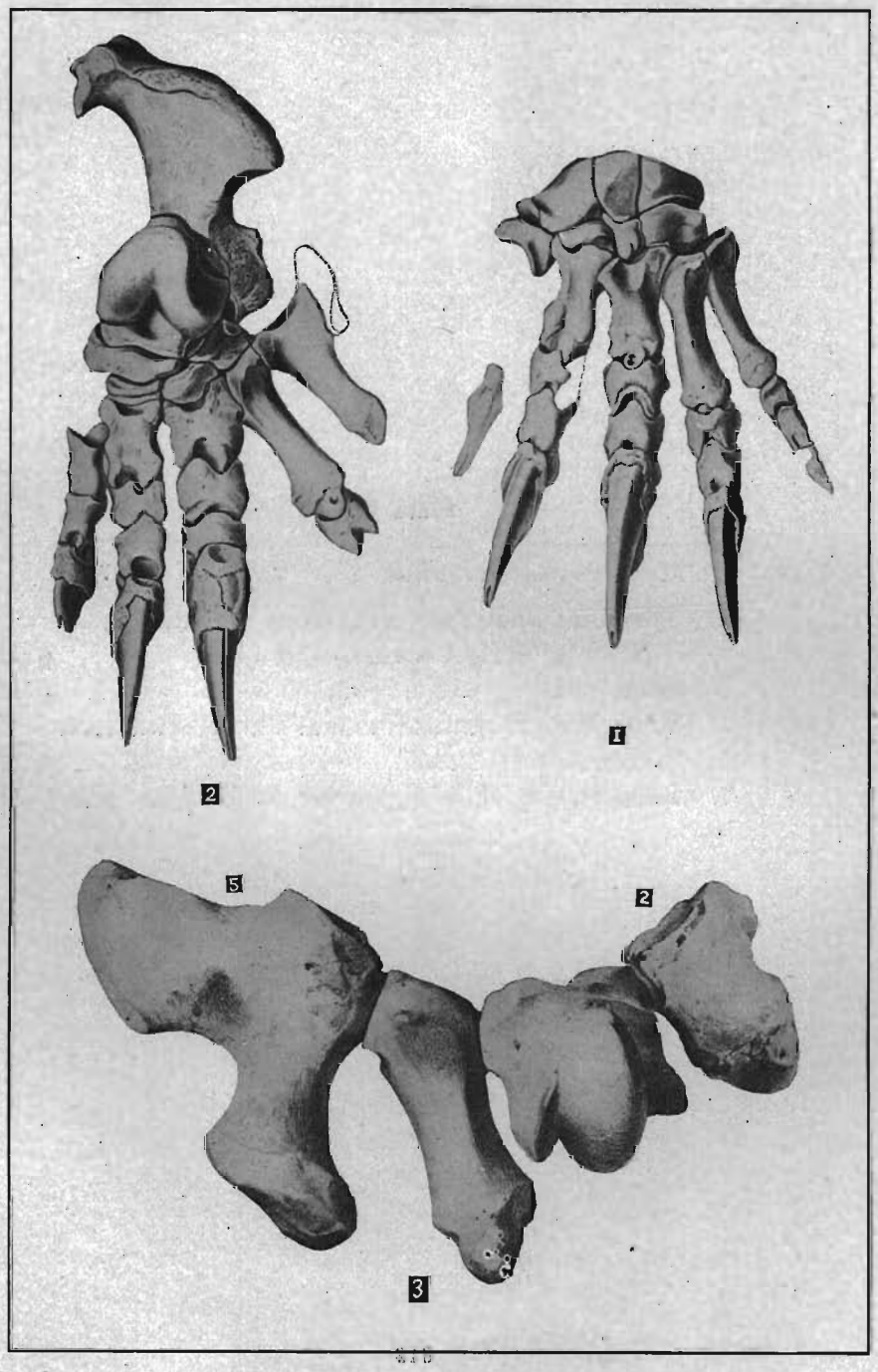
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Plate V.

Figs. 1-4. *Megalonyx jeffersonii?*

1. Terminal phalange, seen from the side. x .8. No. 174, State University of Iowa.....p. 128
2. Same phalange, seen from below. x .8.....p. 128
3. View of right radius found at Turin, Iowa, seen from front. x .3.....p. 129
4. Same radius, showing border next to ulna. x .3. p. 129

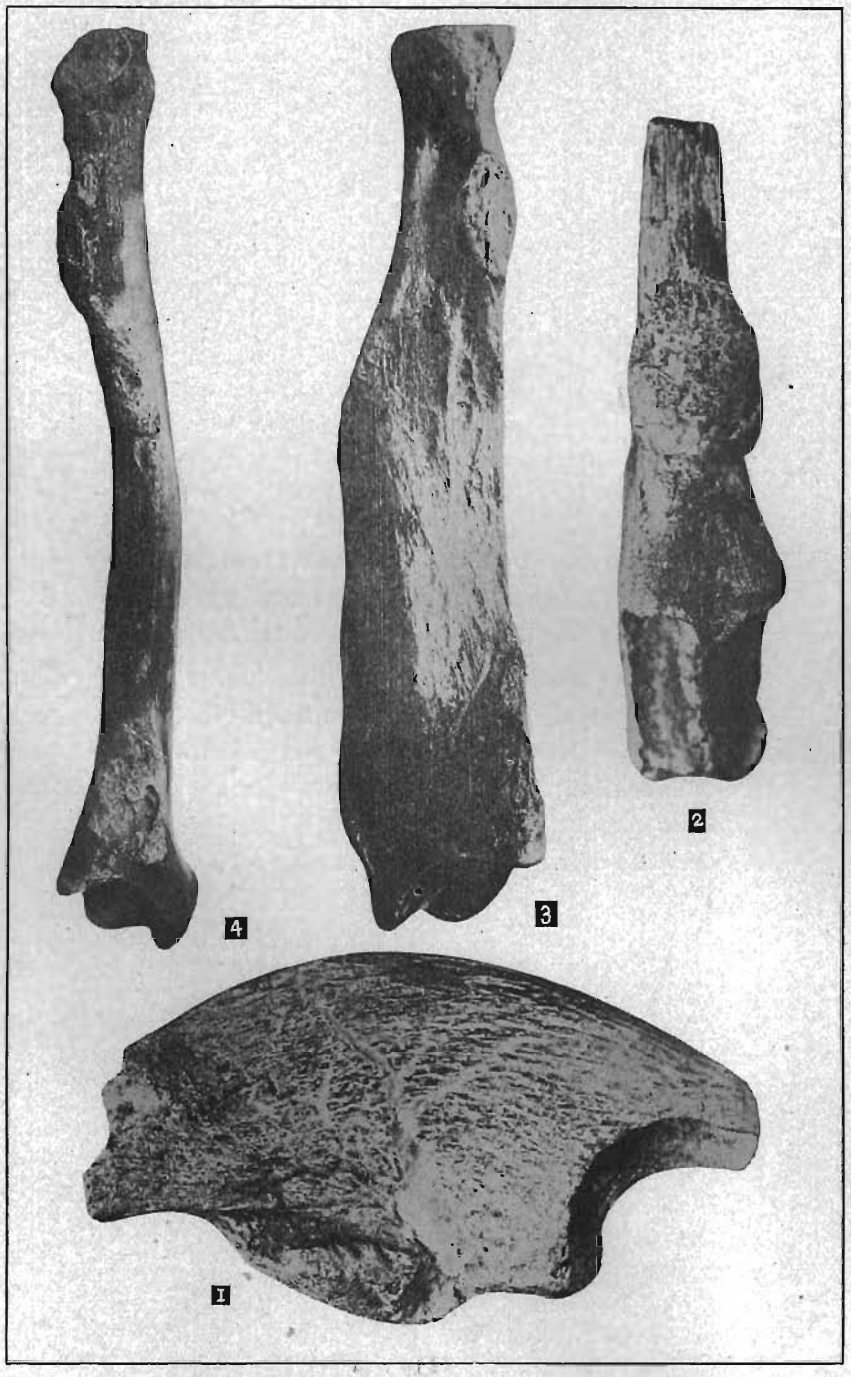
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Plate VI.

Figs. 1,2. Megalonyx. Lumbar vertebra from Missouri Valley, Iowa. x .3. Inverted by the engraver ..... p. 130

1. Vertebra seen from behind.
2. Same vertebra seen from the right side.

Figs. 3,4. *Mylodon harlani.* Lower jaw of the type specimen ..... p. 132

3. Jaw seen from above. x .66.
4. Jaw seen from right side. x .56.

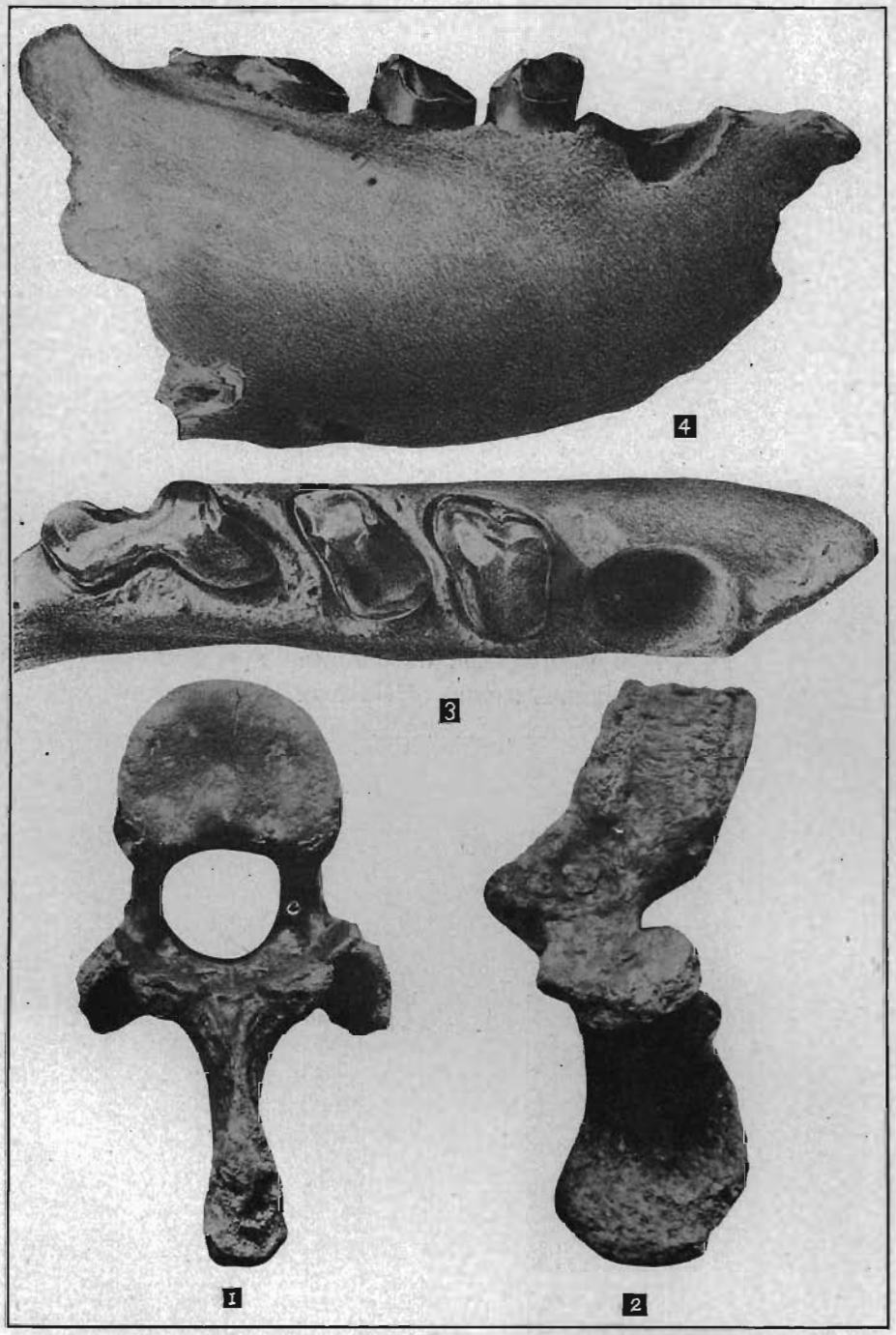
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Plate VII.

Mylodon robustus. Found in South America. From photograph of mounted specimen in American Museum of Natural History, New York ..... p. 132

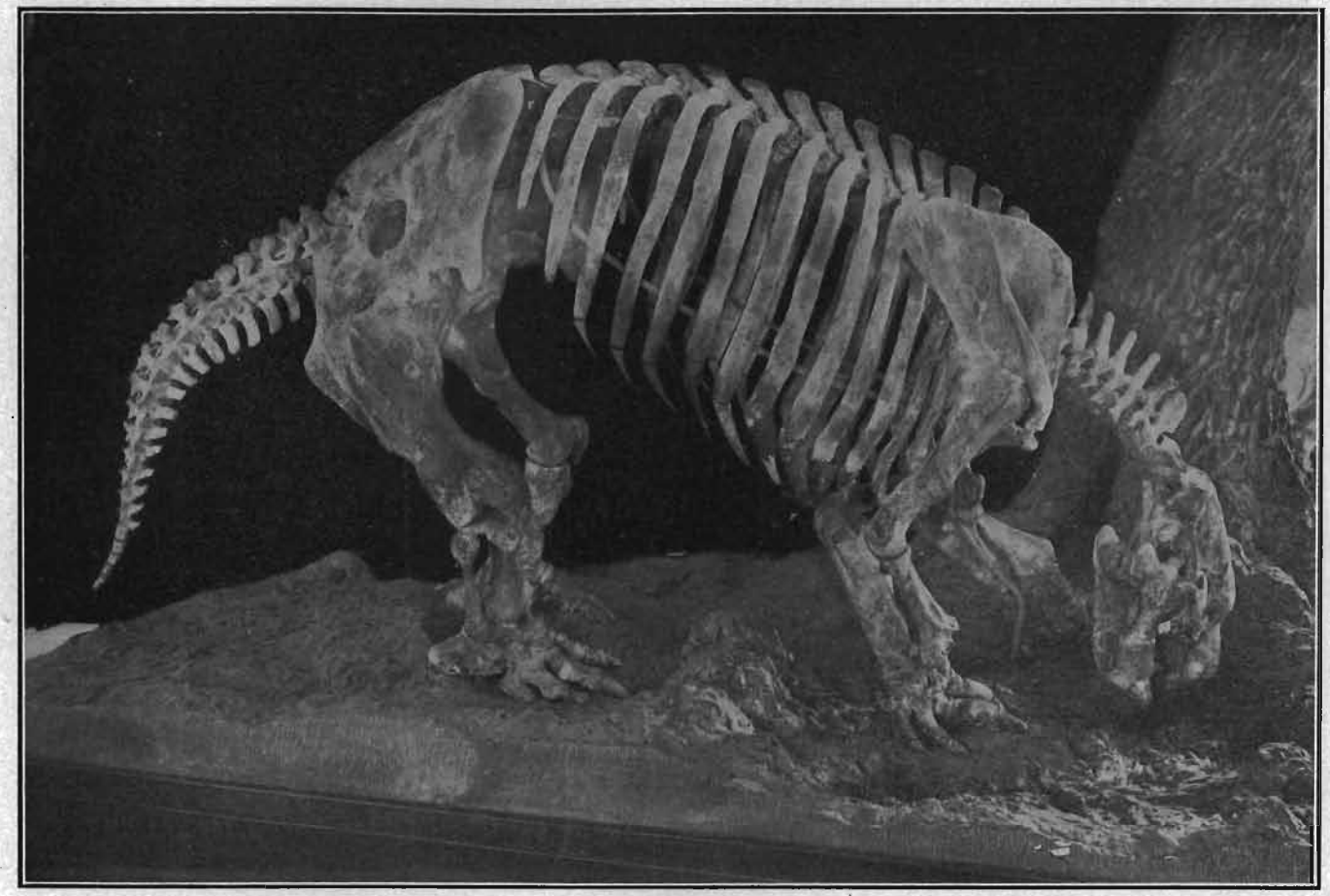

Plate VIII.

Figs. 1, 2. *Mylodon harlani?* Claw of third digit. x 1. . . . p. 142

1. Claw seen from the side.
2. Claw seen from above.

Fig. 3. *Neohipparion speciosum.* Skull seen from the side. x .35. . . . . p. 148

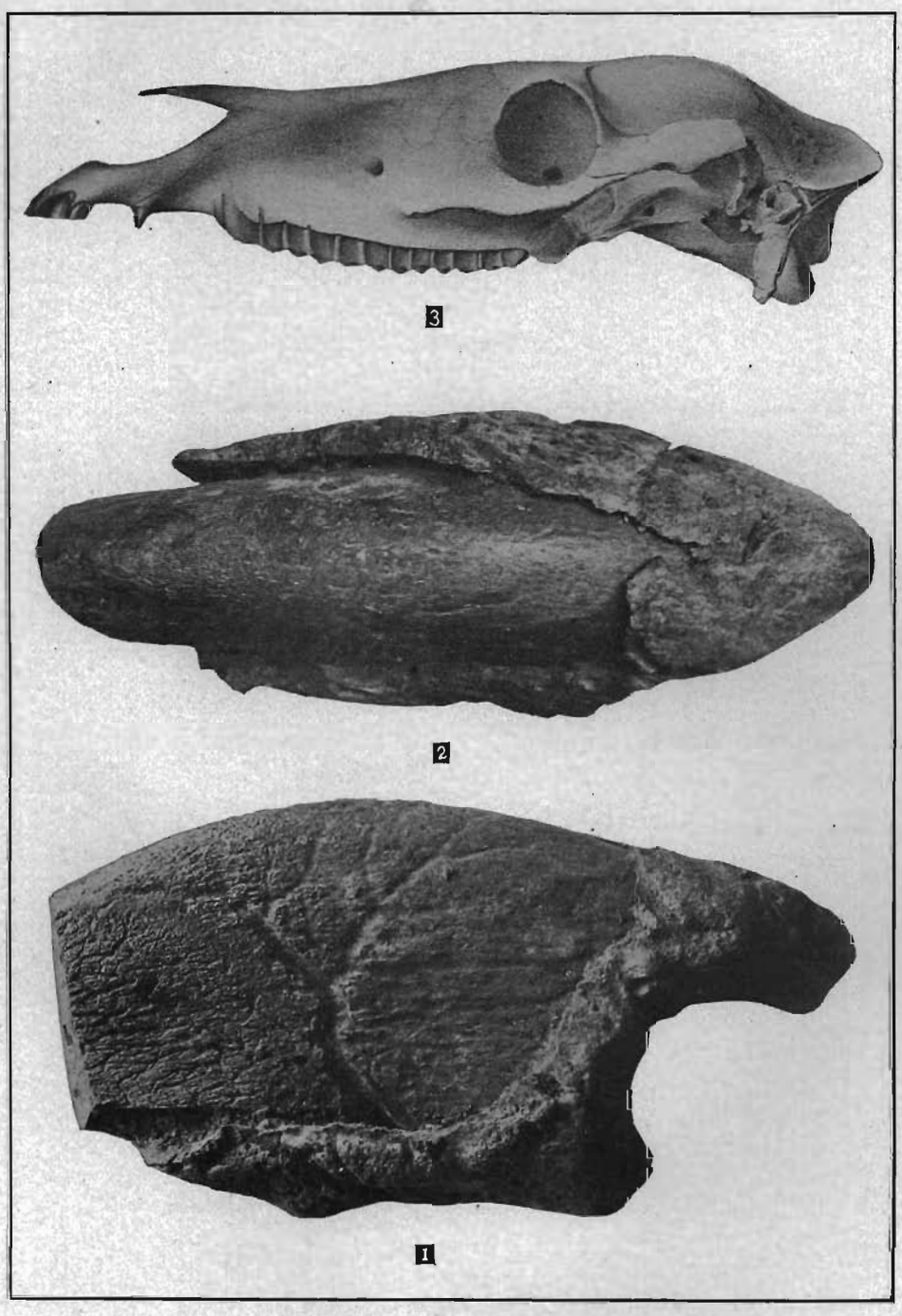
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Plate IX.

Figs. 1,2. *Neohipparion gratum?* Upper premolar or molar of the right side. x 1. From Thayer, Iowa ..... p. 149

1. Tooth seen from the front.
2. Tooth showing grinding surface.

Figs. 3,4. *Neohipparion gratum?* Foot bones. x 1..... p. 150

3. Metatarsal; proximal portion, seen from rear.
4. Proximal phalange, seen from rear.

Fig. 5. *Equus complicatus.* Front of lower jaw, with incisor teeth. x 3/4. From Cope..... p. 160

Fig. 6. *Equus complicatus.* Premolars and molars. x 4/5. From Cope ..... pp. 159, 160

Fig. 7. *Neohipparion gratum?* Metatarsal, seen from front. x 1 ..... p. 150

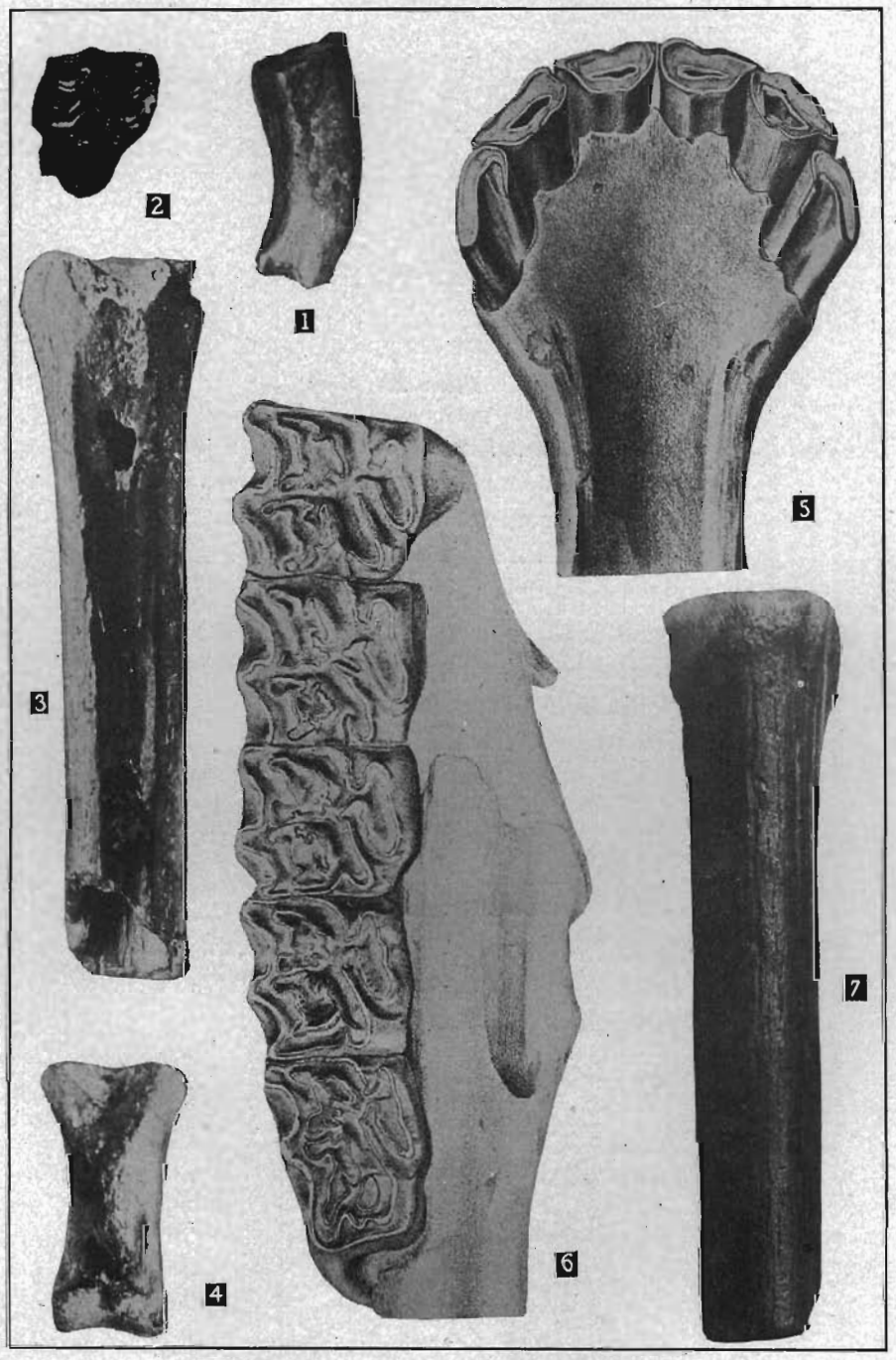
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Plate X.

Figs. 1,3. *Equus complicatus.* Two views of a left upper premolar. x 1. No. 116, State University of Iowa. From Missouri Valley.....p. 166

1. View of grinding surface.
3. View of outer face of tooth.

Figs. 2,4. *Equus niobrarensis.* Two views of supposed upper fourth premolar. x 1. No. 117, State University of Iowa.....p. 199

2. View of grinding face.
4. View of outer face.

Fig. 5. *Equus complicatus.* View of grinding surface. x 1. No. 119, State University of Iowa. Cox pit, Missouri Valley.....p. 177

Fig. 6. *Equus complicatus.* View of grinding surface of upper tooth, fourth premolar? x 1. No. 118, State University of Iowa.....p. 174

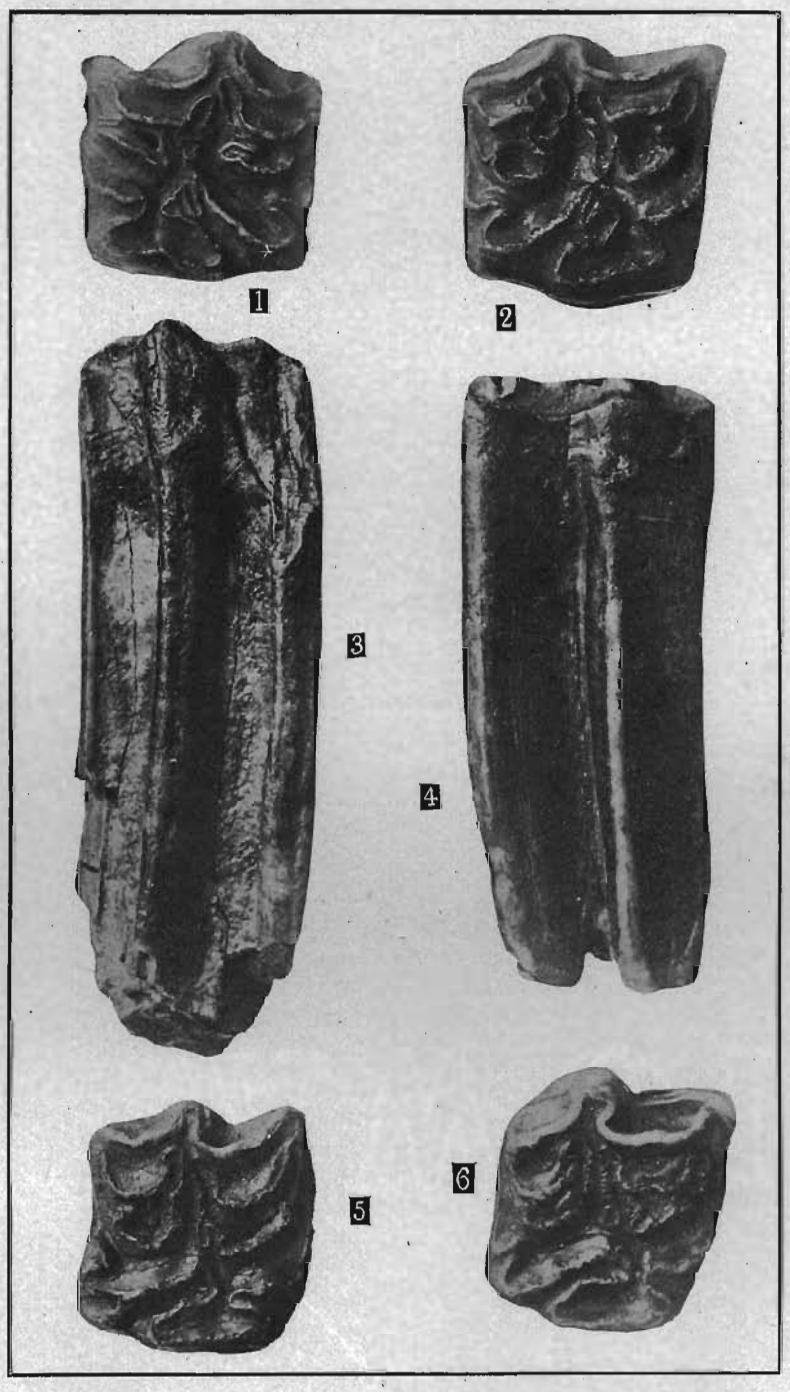
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Plate XI.

Equus complicatus. Upper and lower cheek-teeth. x 1.
Nos. 219, 220, State University of Iowa.....p. 169

Fig. 1. Left upper teeth.
Fig. 2. Right lower teeth.

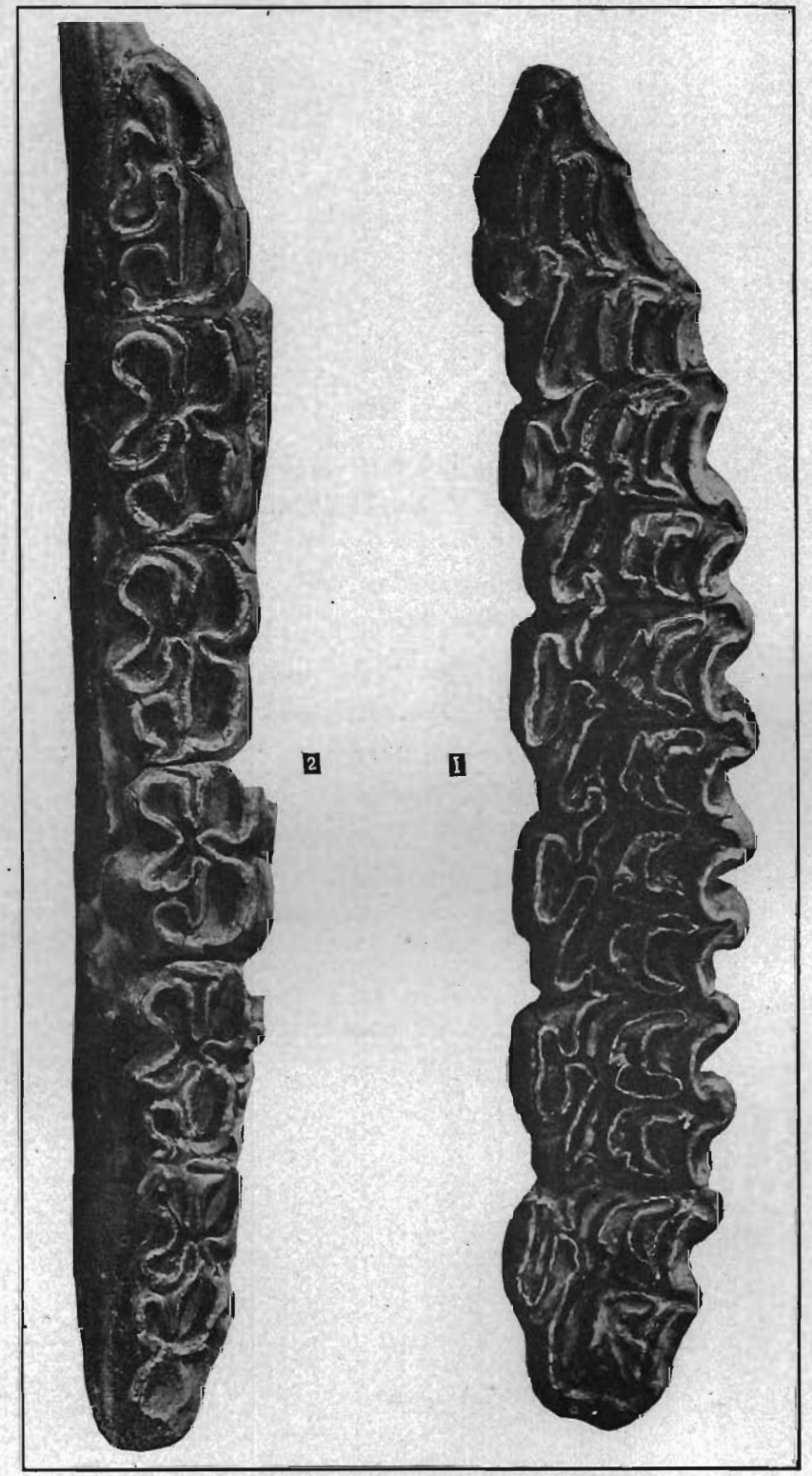
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Plate XII.

Figs. 1,3. *Equus complicatus.* Two views of second lower left molar. x 1. No. 132, State University of Iowa ..... p. 171

1. View of grinding surface.
3. View of the inner face.

Figs. 2,4. *Equus complicatus.* Two views of lower left molar. x 1. No. 131, State University of Iowa ..... p. 172

2. View of grinding surface.
4. View of outer face.

Fig. 5. *Equus complicatus.* Left lower tooth, probably a molar. x 1. No. 119, State University of Iowa ..... p. 177

Fig. 6. *Equus complicatus.* Part of the right ramus of lower jaw with two hinder molars. x 1. No. 127, State University of Iowa ..... p. 172

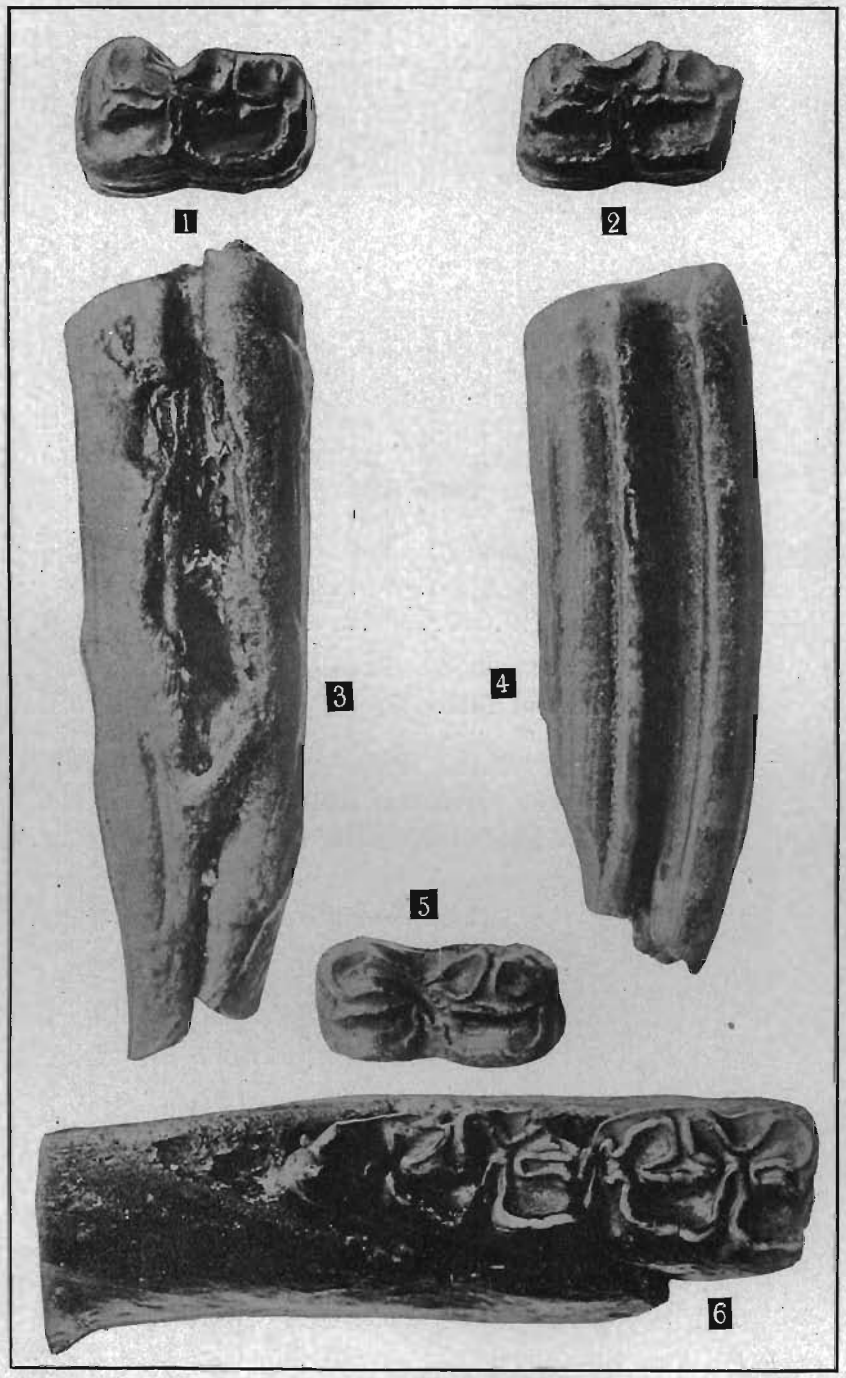
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Plate XIII.

Figs. 1,2. *Equus complicatus.* Two views of lower left last molar. x 3/4. No. 134, State University of Iowa ..... p. 172

1. View of outer face.
2. View of inner face.

Fig. 3. *Equus laurentius.* Part of right upper jaw with three premolars and two molars. x 1. No. 133, State University of Iowa ..... p. 207

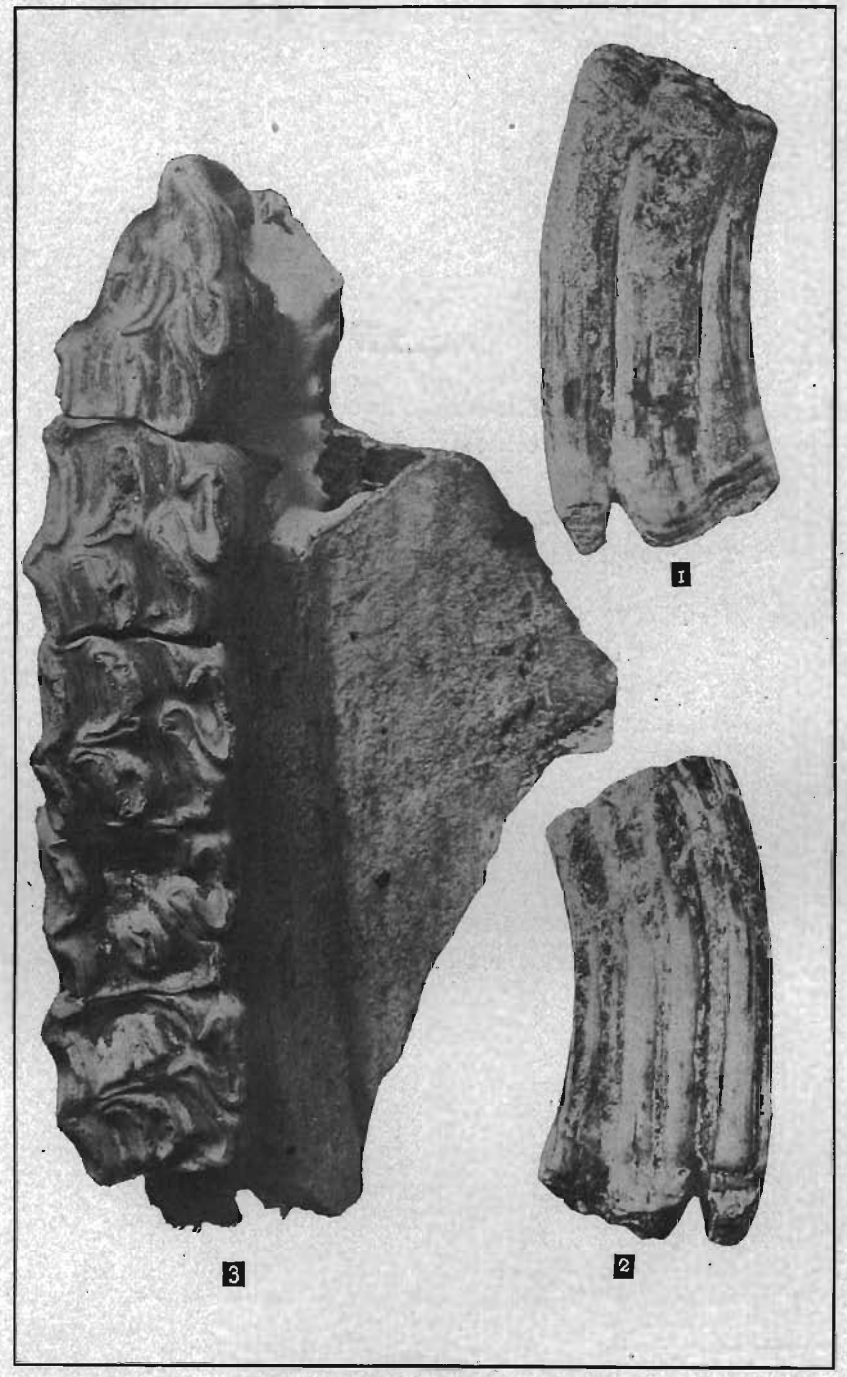
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Plate XIV.

Figs. 1,2. *Equus complicatus.* Two views of lower right second premolar. No. 120, State University of Iowa ..... p. 174

1. View of outer face. x 1.
2. View of inner face. x 3/4.

Figs. 3,4. *Equus niobrarensis.* Upper and lower incisors of the type ..... p. 195

3. Upper incisors. x 2/3..... p. 195
4. Lower incisors. x 1..... p. 196

Fig. 5. *Equus niobrarensis.* Lower incisors of "No. 24," American Museum of Natural History. x 2/3 ..... p. 196

Fig. 6. *Equus excelsus?* Lower incisors. x 2/3. No. 2762, American Museum of Natural History. p. 196

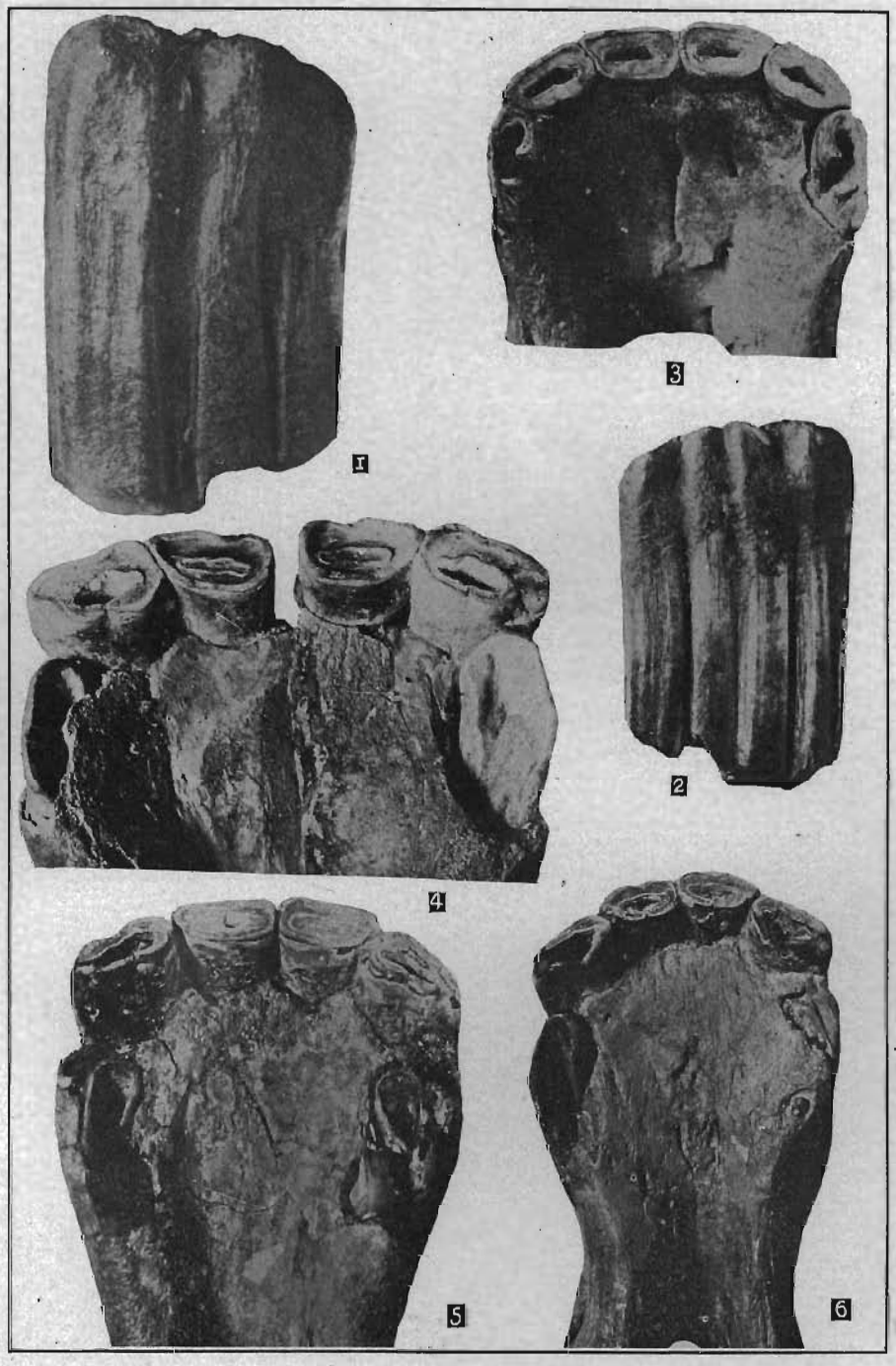
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Plate XV.

Figs. 1,2. *Equus niobrarensis.* Two views of the skull of the type. Slightly less than three-tenths natural size ..... p. 191

1. View from below.
2. View from above.

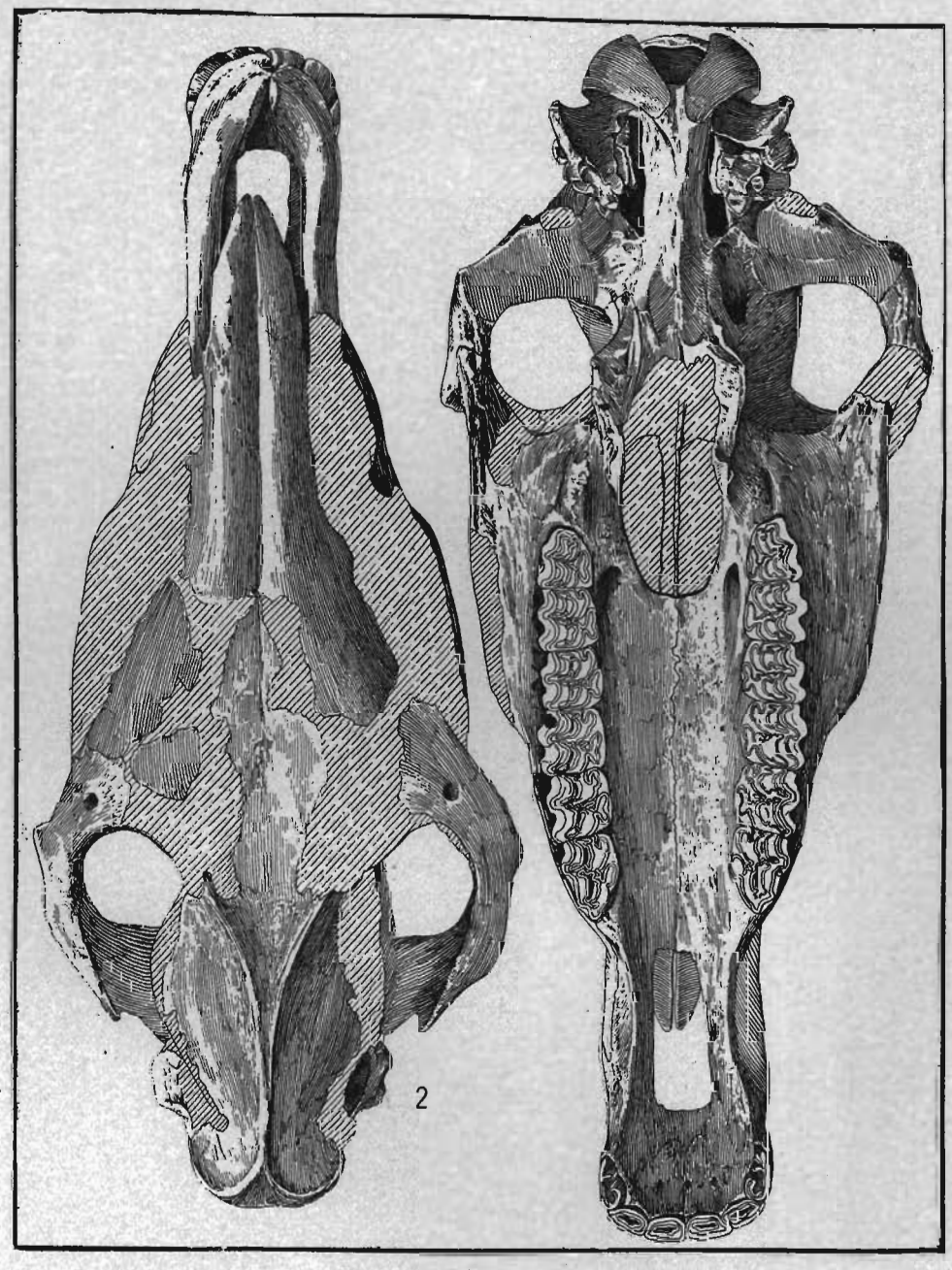
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Plate XVI.

Equus niobrarensis. Side view of the skull of the type. Slightly less than one-fourth natural size.....p. 191

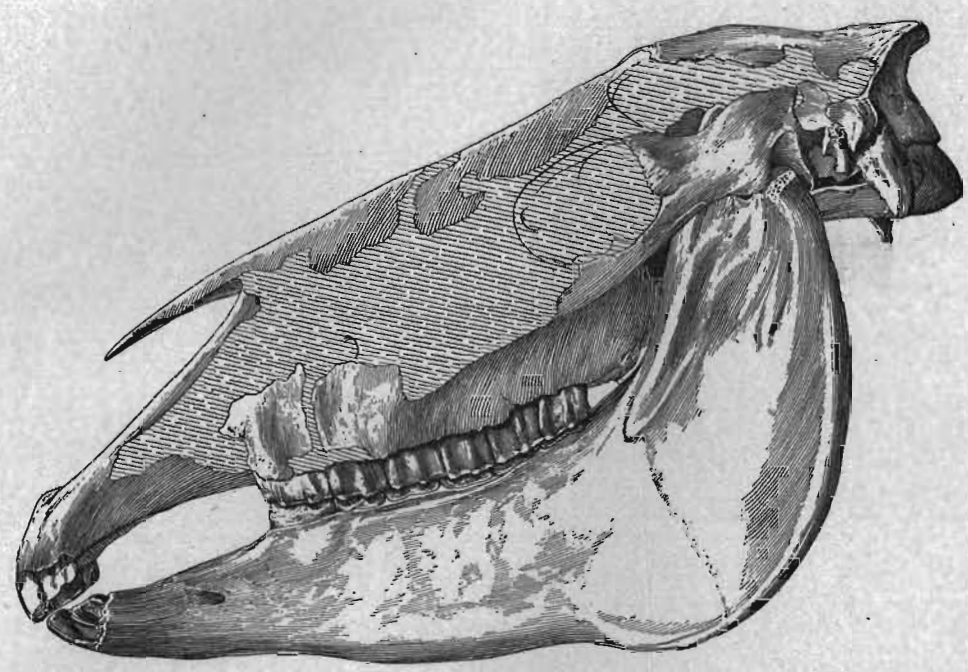


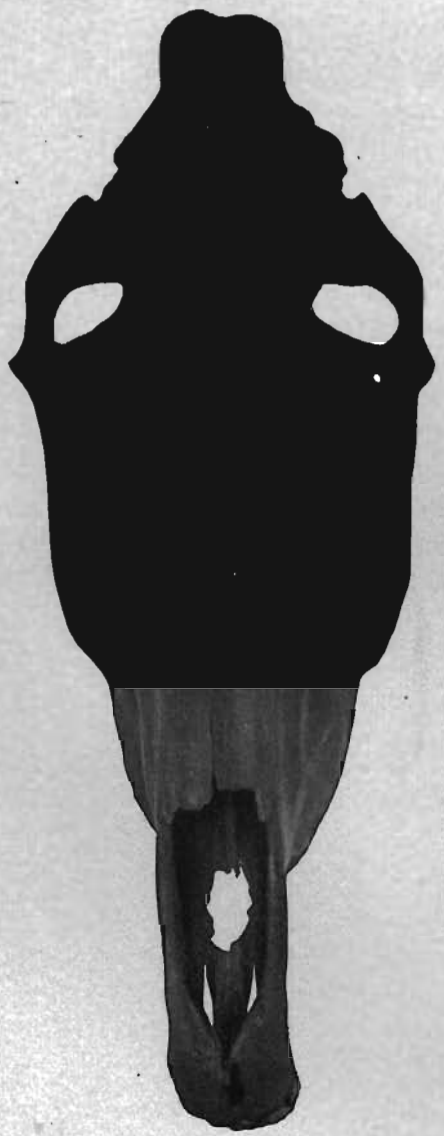
Plate XVII.

Equus laurentius. Side view of the type. x .283 . . . . . p. 202

Plate XVIII.

Figs. 1, 2. *Equus laurentius.* Two views of the type. x .28 ..... p. 202

1. View from above.
2. View from below.



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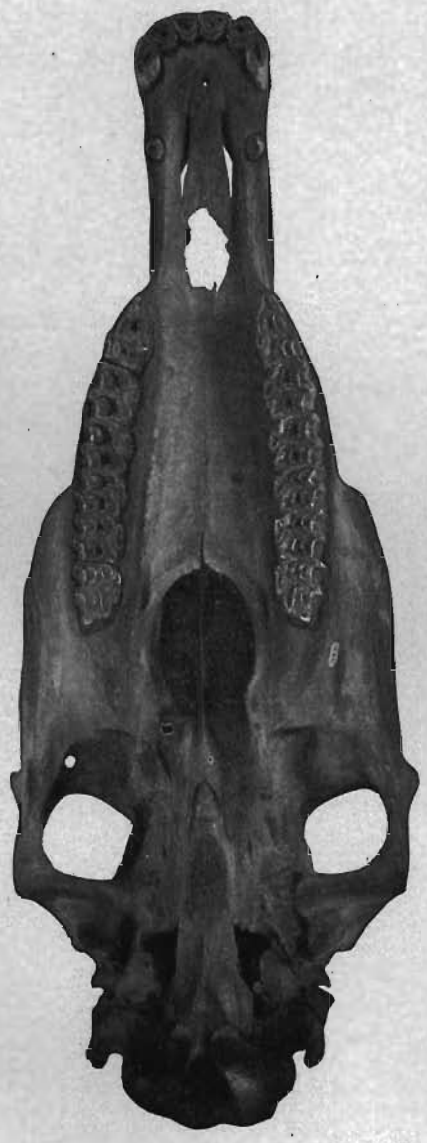

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Plate XIX.

Figs. 1-4. *Tayassu angulatus.* Views of the skull and teeth. From Baird ..... p. 214

1. Side view of the skull and lower jaw. x 2/5 .... p. 214
2. Skull seen from below. x 2/5 ..... pp. 214, 217
3. Lower teeth of left side. x 1 ..... p. 217
4. Upper teeth of left side. x 1 ..... pp. 216, 217

Figs. 5,6. *Tayassu angulatus.* Views of upper and lower teeth. Slightly less than natural size. No. 52128, National Museum.

5. Upper teeth of right side ..... pp. 216, 217
6. Lower teeth of right side ..... p. 217

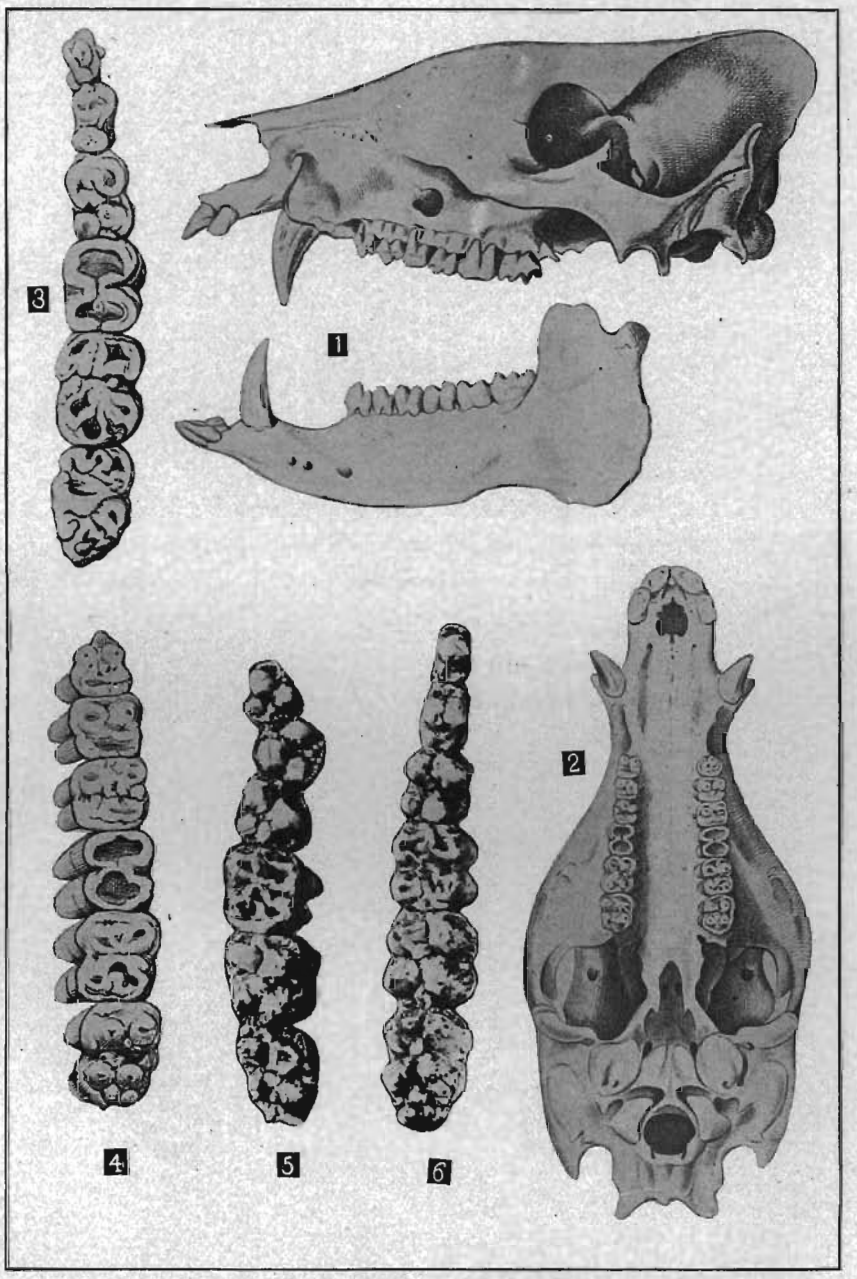
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Plate XX.

Figs. 1-3. *Platygonus compressus.* Three views of the skull. x 1/3. After Leidy.....pp. 218, 219

1. Skull seen from the side.
2. Skull seen from above.
3. Skull seen from below.

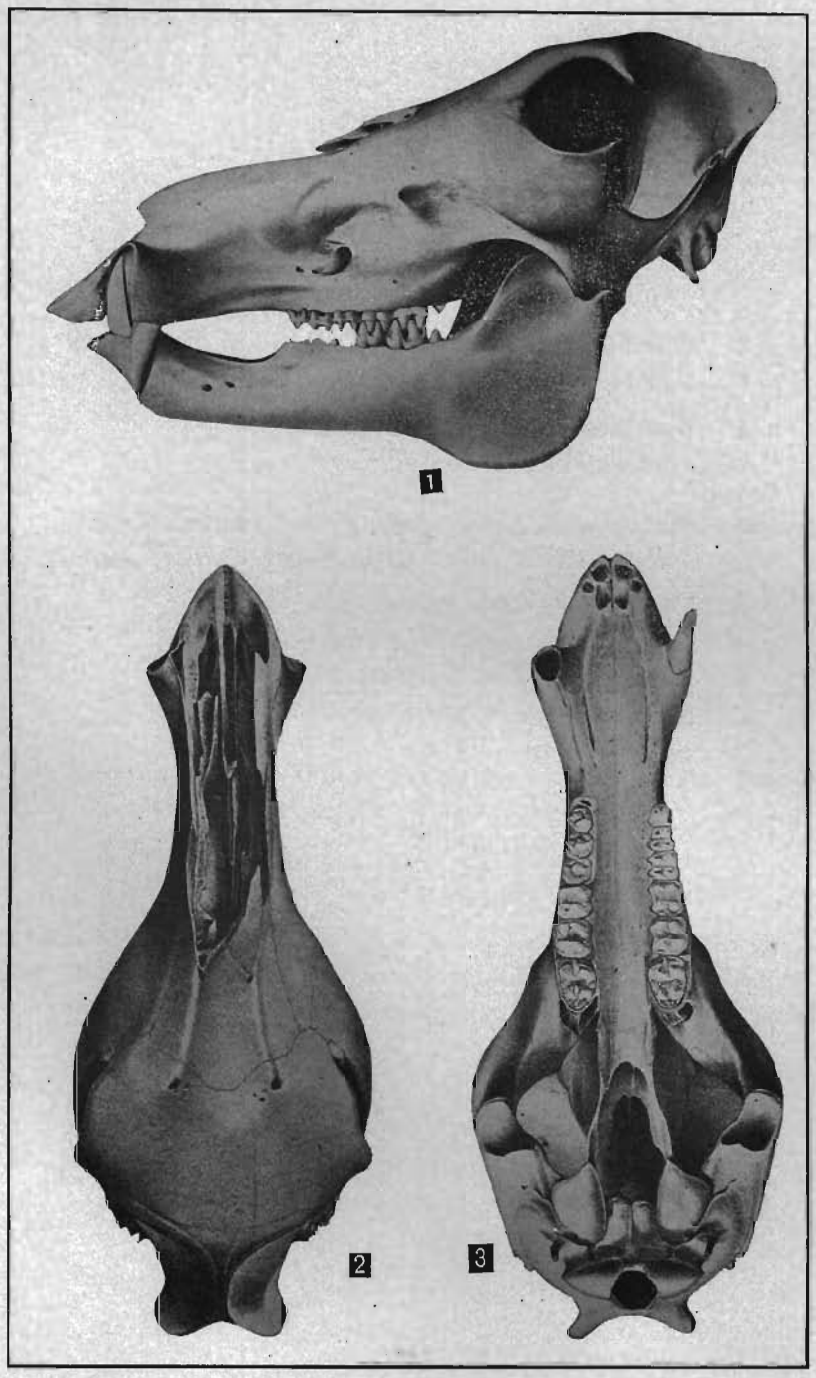
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Plate XXI.

Figs. 1,2. *Mylohyus? temerarius.* Two views of the left lower canine. Type. x 1.....p. 227

1. Tooth seen from the outer side.
2. Tooth seen from behind.

Figs. 3-6. *Platygonus compressus.* Four views of the cheek-teeth. x 1. After Leidy.....pp. 219, 220

3. Upper teeth seen from below.
4. Upper teeth seen from the outer side.
5. Lower teeth seen from above.
6. Lower teeth seen from the outer side.

Figs. 7,8. *Platygonus compressus.* Figures of teeth found at Burlington. x 1. From Leidy.....p. 225

7. Upper teeth.
8. Lower teeth.

In figures 5 and 6, from error in the original figure, the hindermost premolar has the hinder end wrongly placed in front, thus making the higher cones to appear in front.

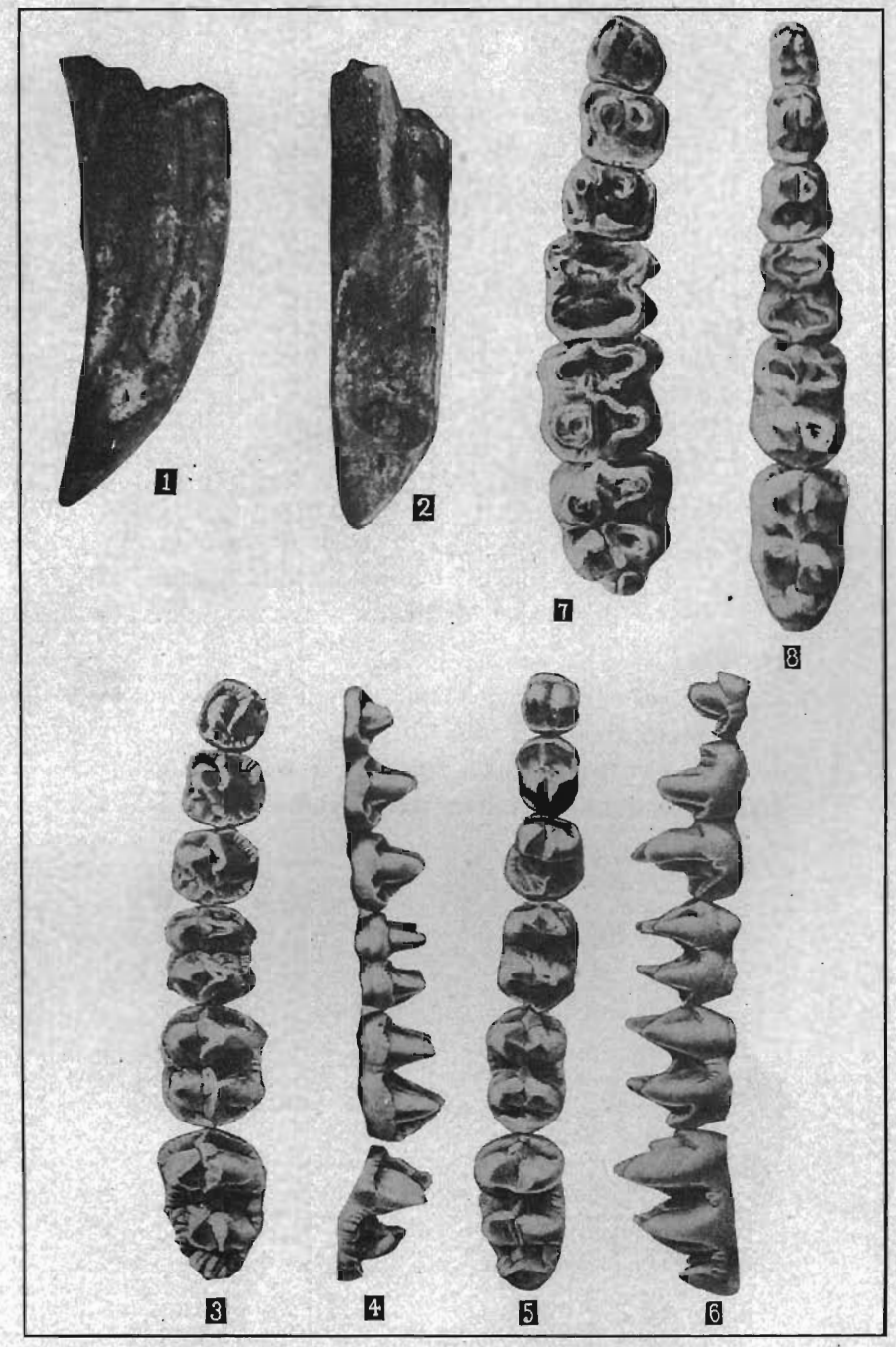
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Plate XXII.

Figs. 1-4. *Platygonus compressus.* Views of vertebræ of specimen found at Columbus, Ohio; now in Yale University Museum.....p. 222

1. View of atlas seen from below. x 1/2.
2. View of cervical vertebræ, except atlas, as seen from above. x .655.
3. Same vertebræ, seen from right side. x .655.
4. Three dorsal vertebræ seen from right side. x 1/2.

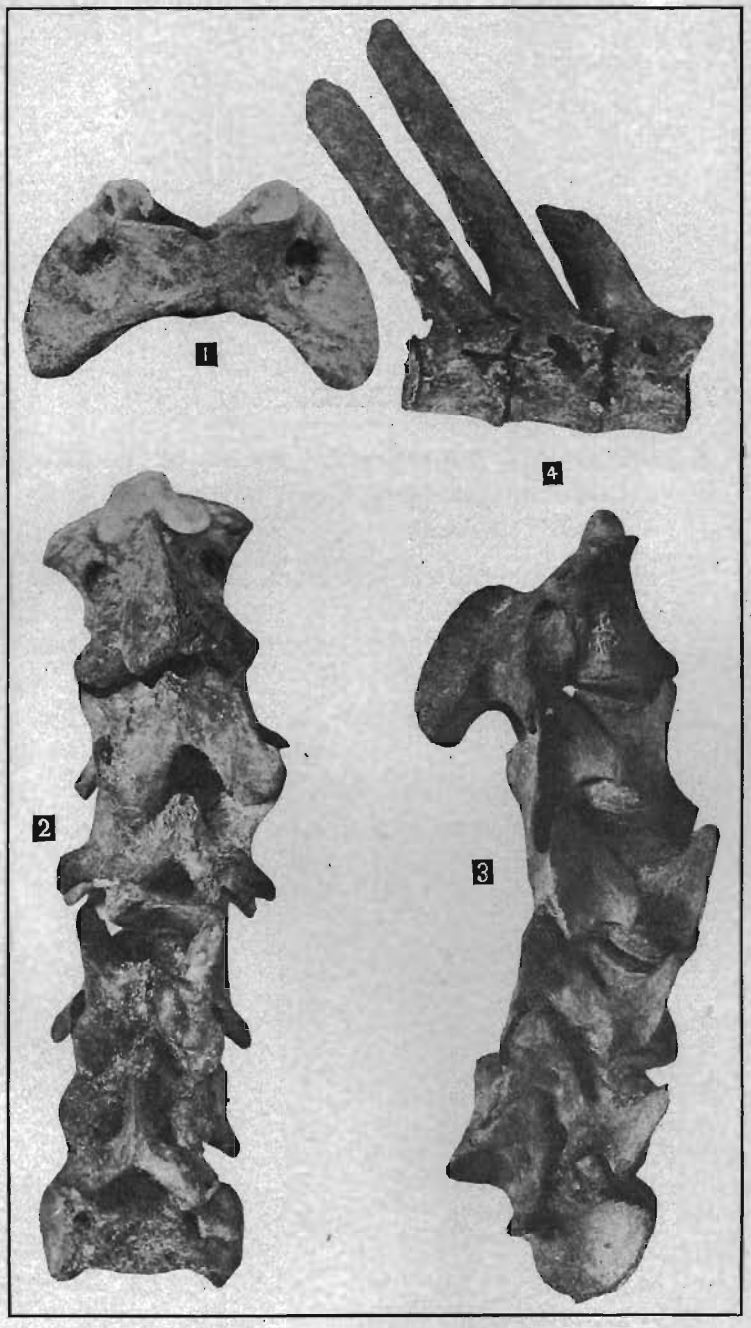
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Plate XXIII.

Figs. 1-5. *Platygonus compressus.* Bones of animals found at Columbus, Ohio; now in Yale University Museum.

1. Sacrum and part of left ilium, seen from below. x 9/16 ..... p. 223
2. Hinder portion of left innominate bone, showing acetabulum. x 9/16 ..... p. 224
3. Humerus of right side, seen from left side. x 1/2 ..... p. 223
4. Same humerus, seen from front. x 1/2 ..... p. 223
5. Ulna and radius of left side, seen from front. x 1/2 ..... p. 223

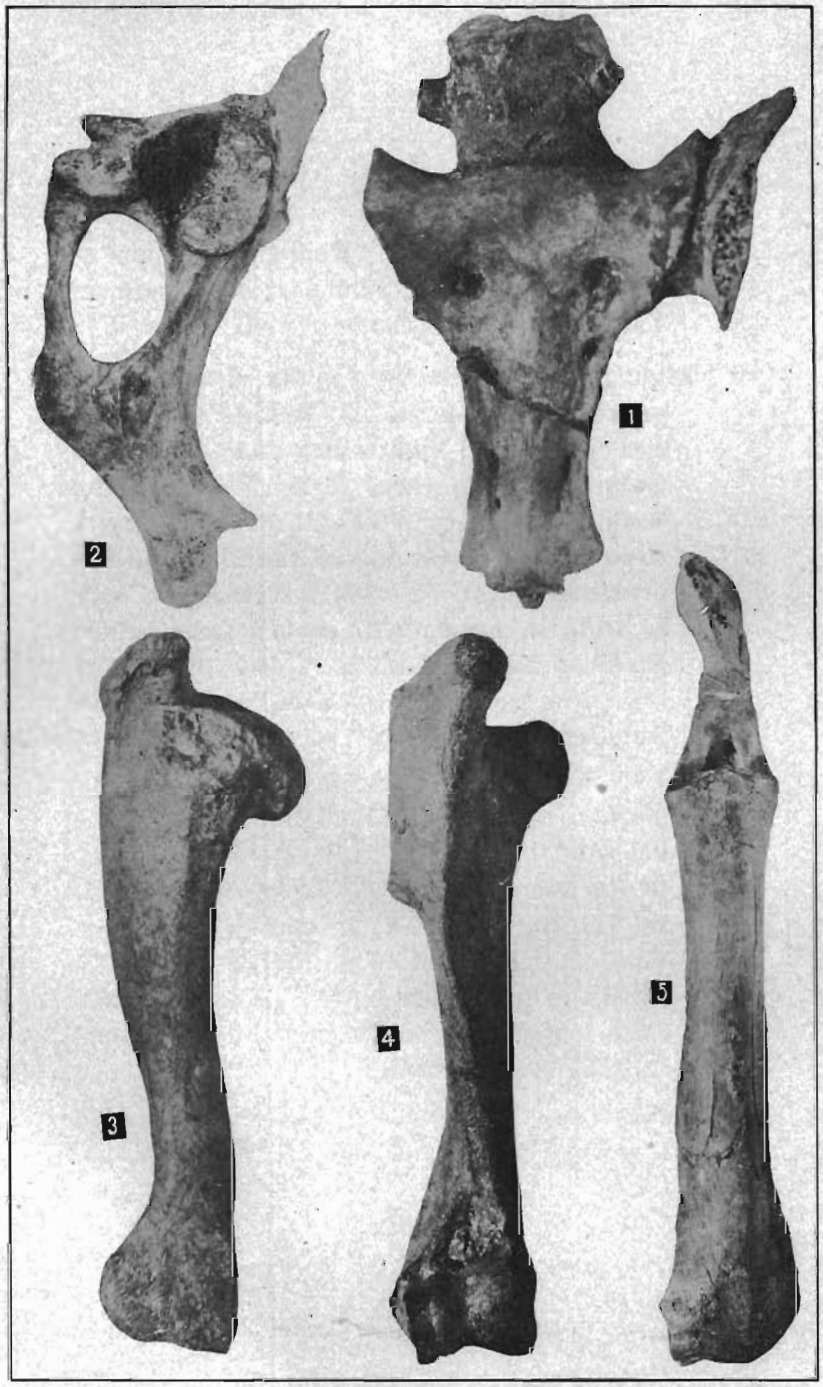
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Plate XXIV.

Figs. 1,2. *Platygonus compressus.* Folded fore limbs of animal found at Columbus, Ohio; now in Yale University Museum. x .40.

1. Right fore limb. Shows scapula with damaged proximal end; humerus (lacking the proximal epiphysis); radius and ulna; the fourth metacarpal; its three phalanges; and the second phalange of the third metacarpal. Between the distal end of the ulna and the proximal end of the fourth metacarpal may be seen the head of the second metacarpal; while on the side of the upper end of the fourth metacarpal is seen the nodular fifth metacarpal ..... pp. 223, 224

2. Left fore limb, seen from in front. Shows humerus, articulated below with the radius; the bones of the wrist; and the two toes, lacking the terminal phalanges. Between and below the digits is seen the proximal end of the ulna. At the right of the upper end of the fourth metacarpal is seen the nodular fifth metacarpal. Just above this and toward the right is the pisiforme..... p. 224

Fig. 3. *Platygonus compressus (leptorhinus).* Left fore foot, seen from behind. From Williston ..... p. 225

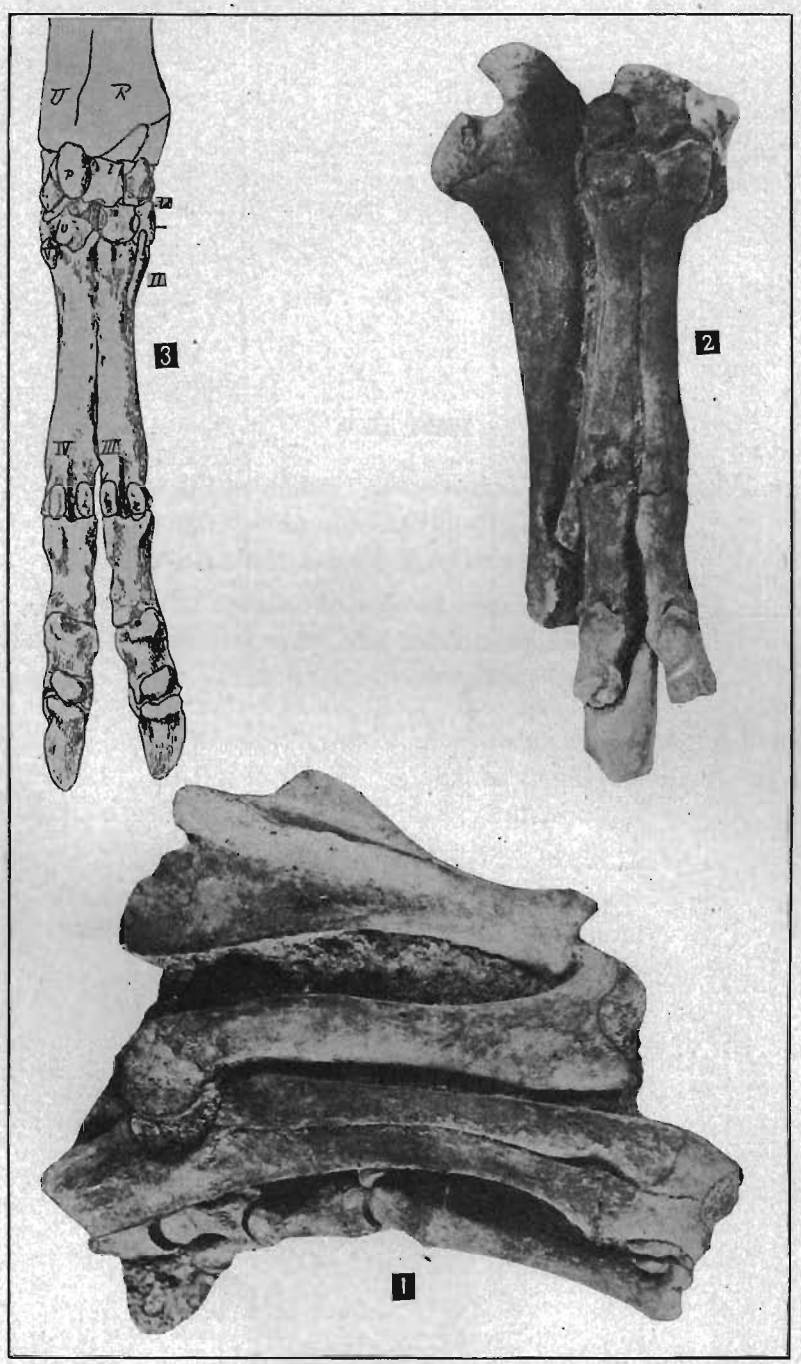
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Plate XXV.

Figs. 1-3. *Platygonus compressus.* Bones of hinder limbs of animals found at Columbus, Ohio; now at Yale University Museum. x .6.

1. Left femur seen from right side.....p. 224
2. Left tibia, seen from left, or outer, side.....p. 224
3. Left hind foot, seen from front.....p. 225

Figs. 4-6. *Mylohyus nasutus?* Three figures of lower jaw and teeth of young animal found in Columbiana county, Ohio.....p. 226

4. Left lower jaw, inner surface. x 1.
5. Same jaw seen from above, showing three milk molars and uncut molar. x 1.
6. View of the uncut first molar. x 2.

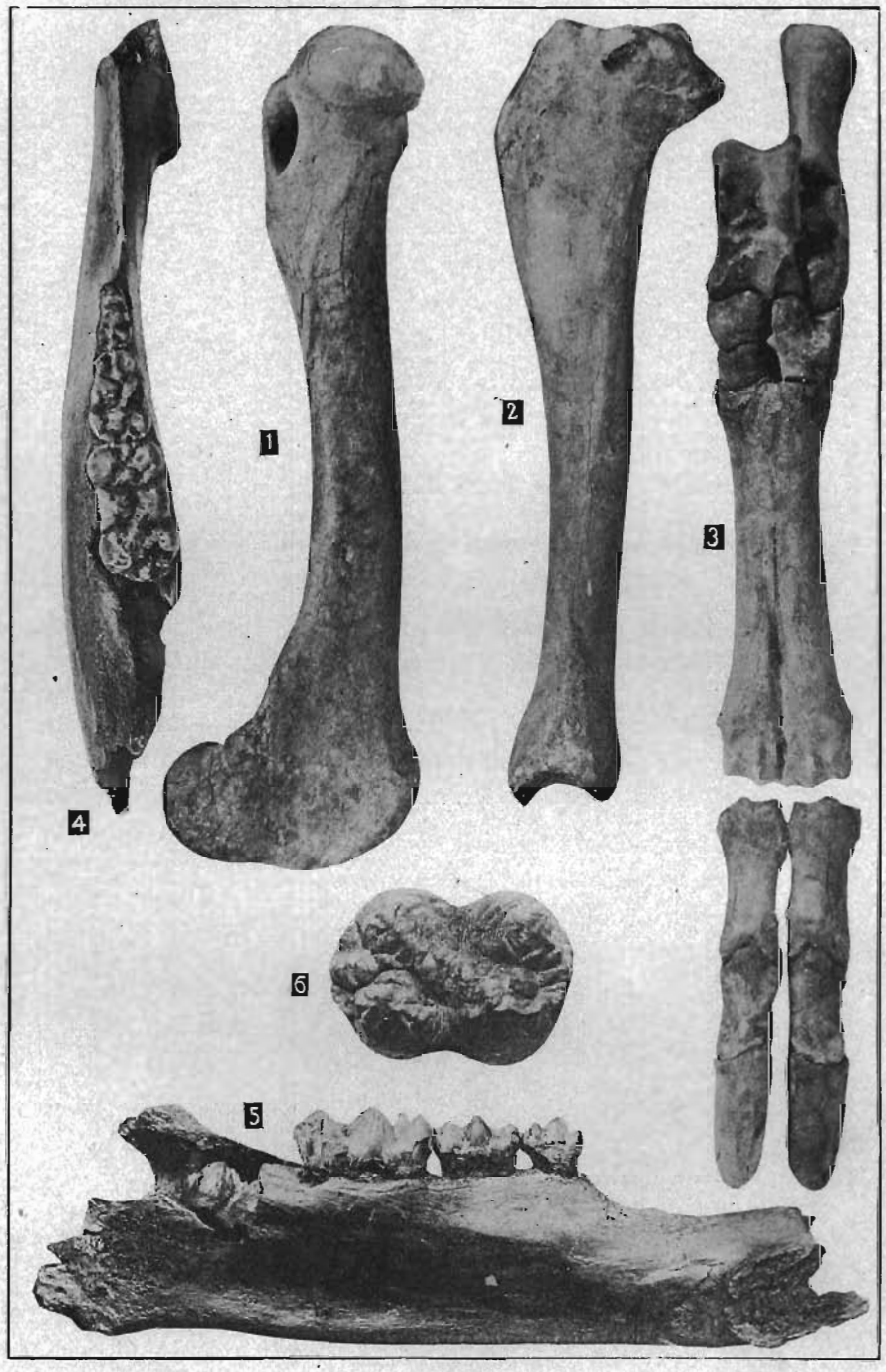
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Plate XXVI.

Figs. 1, 2. *Mylohyus nasutus.* Two views of the snout of the type. x 1 ..... p. 226

1. Snout seen from below.
2. Same specimen seen from the right side.

Figs. 3-5. Mylohyus sp.? Views of lower jaw and foot from Conard fissure, Arkansas. From Barnum Brown ..... pp. 226, 227

3. Jaw seen from above. x 1/3.
4. Left side of jaw, inner face. x 1/3.
5. Fore foot, seen from front. x 1/4.

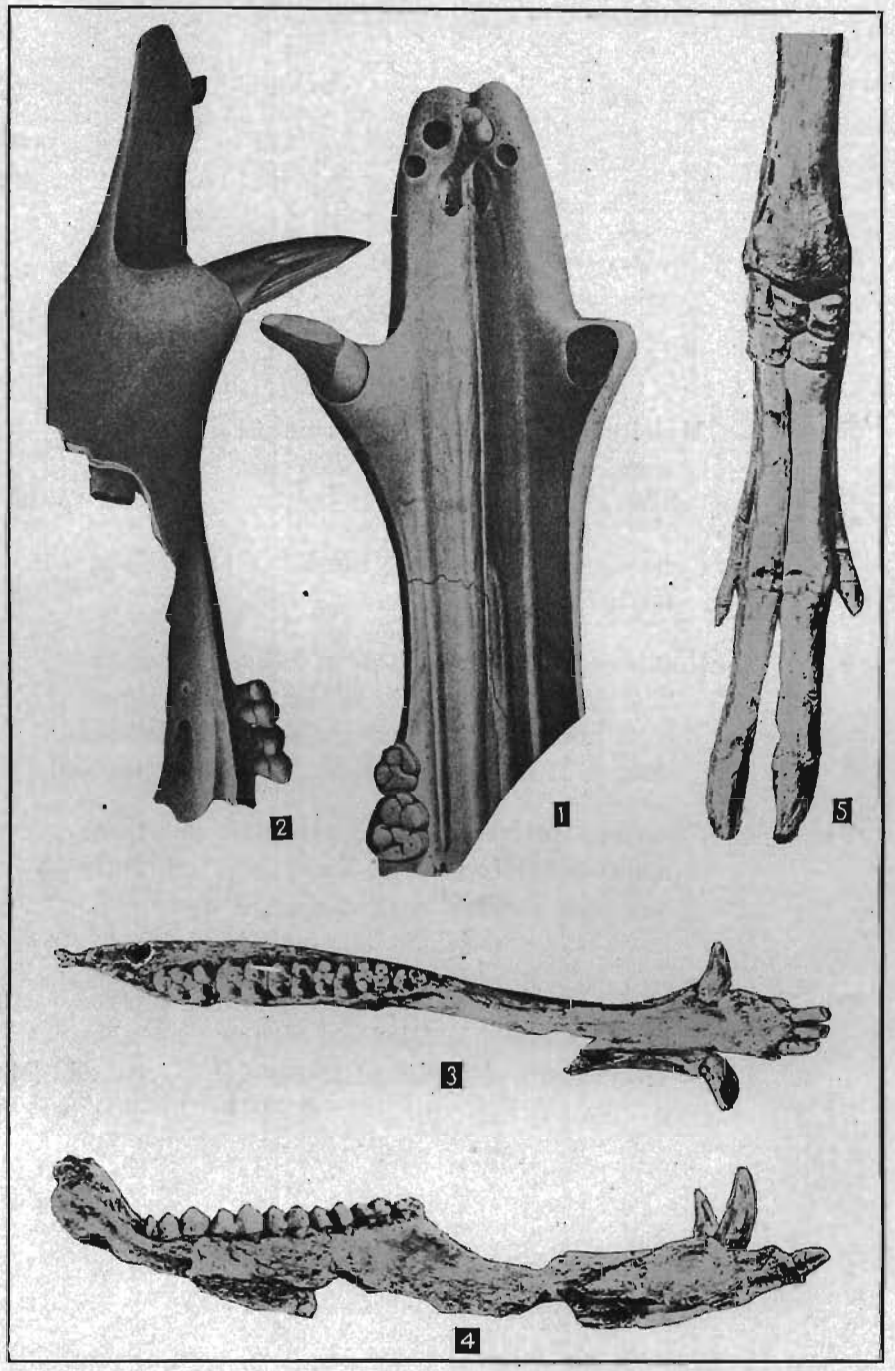
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Plate XXVII.

Fig. 1. Mylohyus sp.? Hind foot found in Conard fissure, Arkansas. From Barnum Brown. x 3/8 ..... p. 227

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Fig. 3. *Camelops kansanus.* View of left side of snout. The figure to the right of the numeral shows a palatal view; the one on the left a lateral one. x 1. From Leidy ..... pp. 232, 233

Fig. 4. *Camelops hesternus.* Last premolar and three molars of left side of lower jaw. Slightly less than one-half natural size. From Leidy. ..... p. 232

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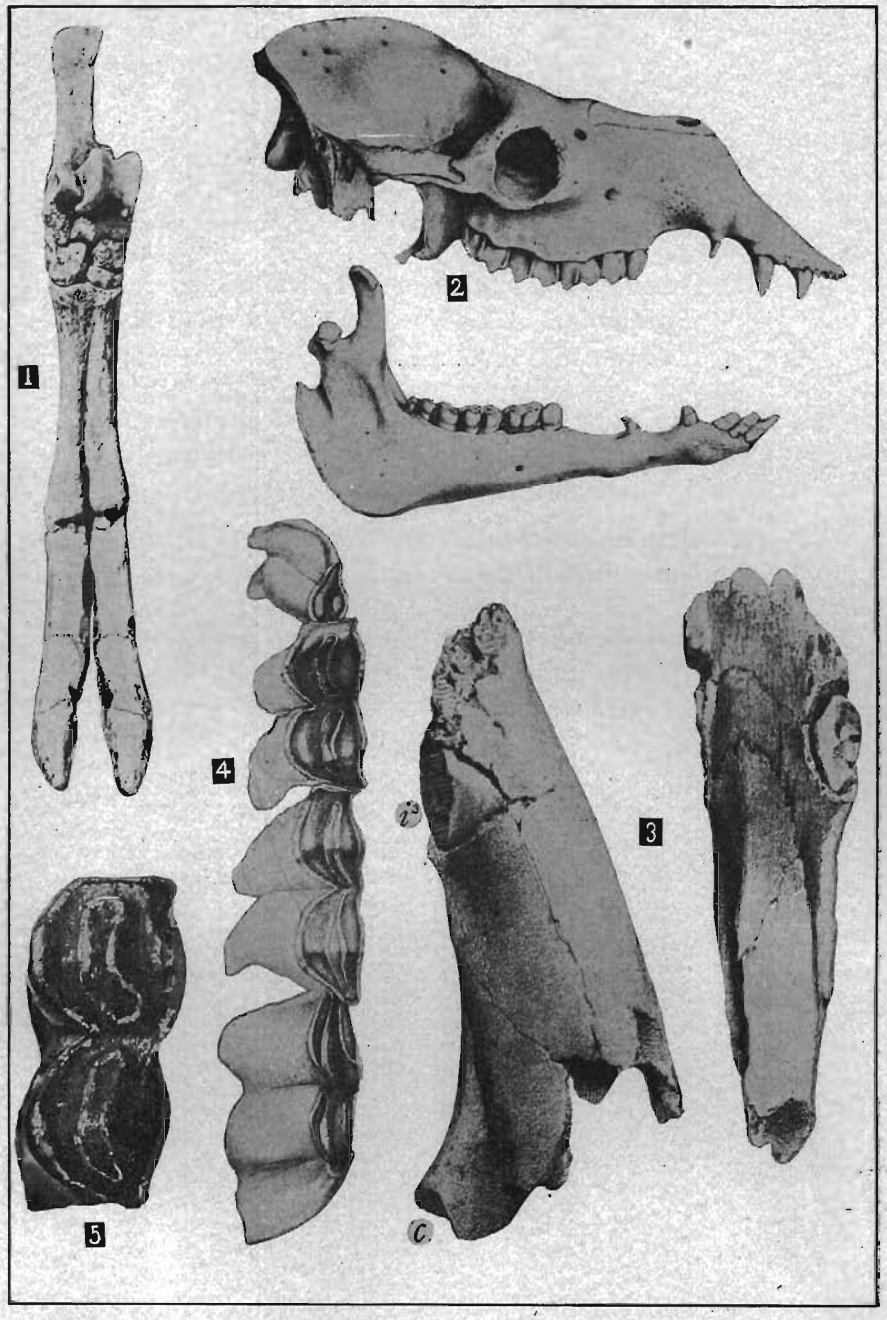
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Plate XXVIII.

Fig. 1. *Camelops huerfanensis?* Lower fourth right premolar. x 1. No. 230, State University of Iowa ..... pp. 239, 243

Figs. 2,3. *Camelops sulcatus* (Cope). Last premolar and three molars of type. Slightly less than one-fourth natural size. From Cope.....p. 232

2. Grinding surface of the teeth.
3. Outer face of the teeth.

Figs. 4,5. *Camelops hesternus?* Left lower jaw and teeth. Texas specimens. Slightly less than one-fourth natural size. From Cope.....p. 232

4. Lower jaw seen from above.
5. Same jaw, outer face.

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Fig. 7. Neohipparion sp.? Section of an upper molar or premolar not yet cut. x 1. Found at Thayer, Iowa .....p. 150

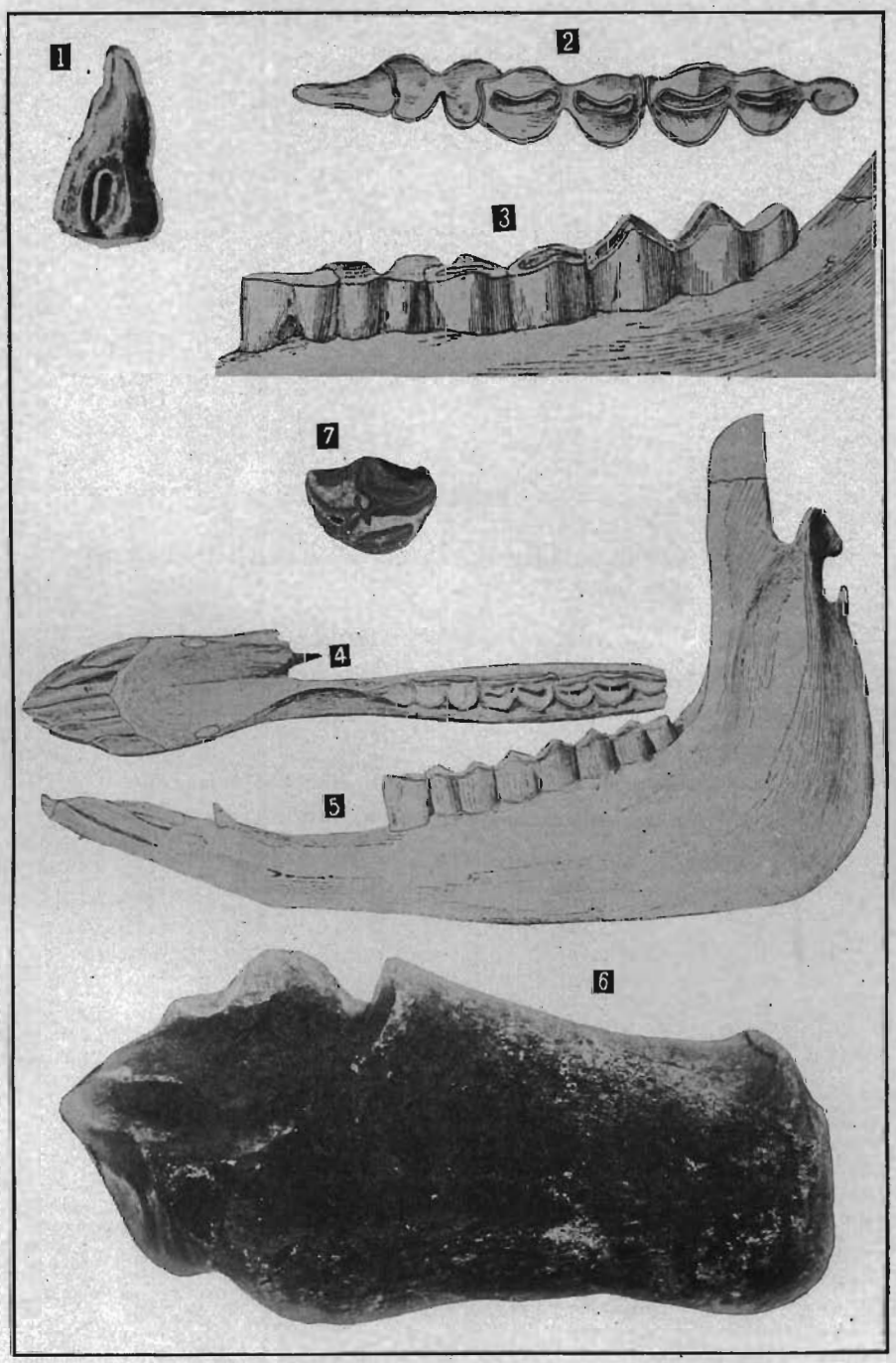
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Plate XXIX.

Figs. 1-4. *Camelops huerfanensis.* Portions of skull of the type ..... p. 235

1. Occipital region, from behind; partly missing. x 2/3.
2. Left premaxilla; some missing in front. Outer face. x 1.
3. Same bone, showing inner face. x 1.
4. Same bone, showing lower edge. x 1.

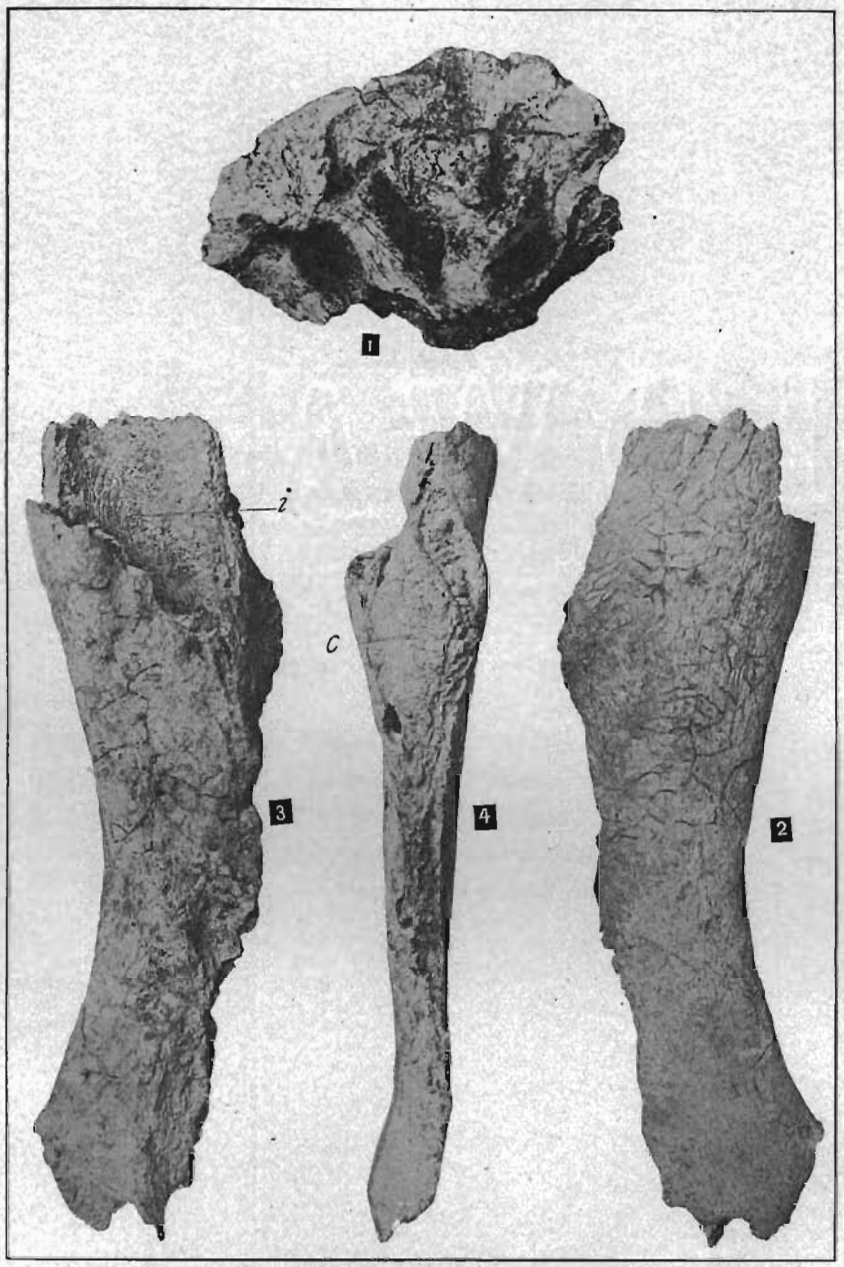
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Plate XXX.

Fig. 1. *Camelops huerfanensis.* Palate of the type, showing the last premolar and the three molars. Teeth of the left side of the jaw injured. x 1/2 ..... pp. 235, 237

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2. Symphysis of lower jaw, with canines and incisors. x 1/2 ..... p. 237
3. Third incisor. x 1. No. 870, National Museum.
4. Second incisor. x 1. No. 870, National Museum.
5. Part of right side of lower jaw, with two premolars and two molars. x 1/2. No. 5315, National Museum.

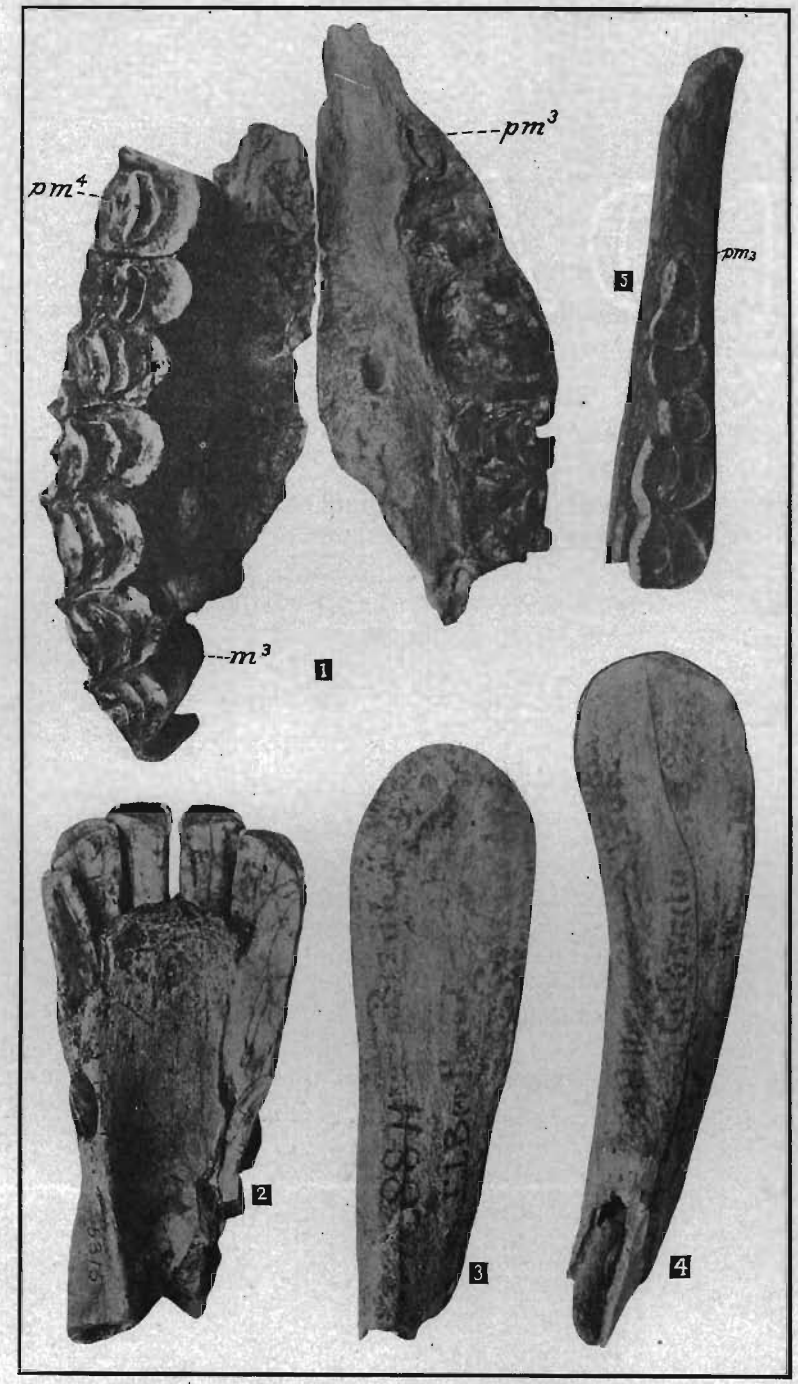
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Plate XXXI.

Figs. 1,2. Camelops? ——— Foot-bones found in Iowa. x 1/2 ..... pp. 59, 241

1. Proximal phalange, found at Henton Station, near Council Bluffs. No. 304, State University of Iowa.
2. Second phalange, found at Turin, Monona county.

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6. Upper teeth.
7. Lower teeth.

Fig. 8. *Alces shimeki.* Teeth of type seen from above. x 1 ..... p. 272

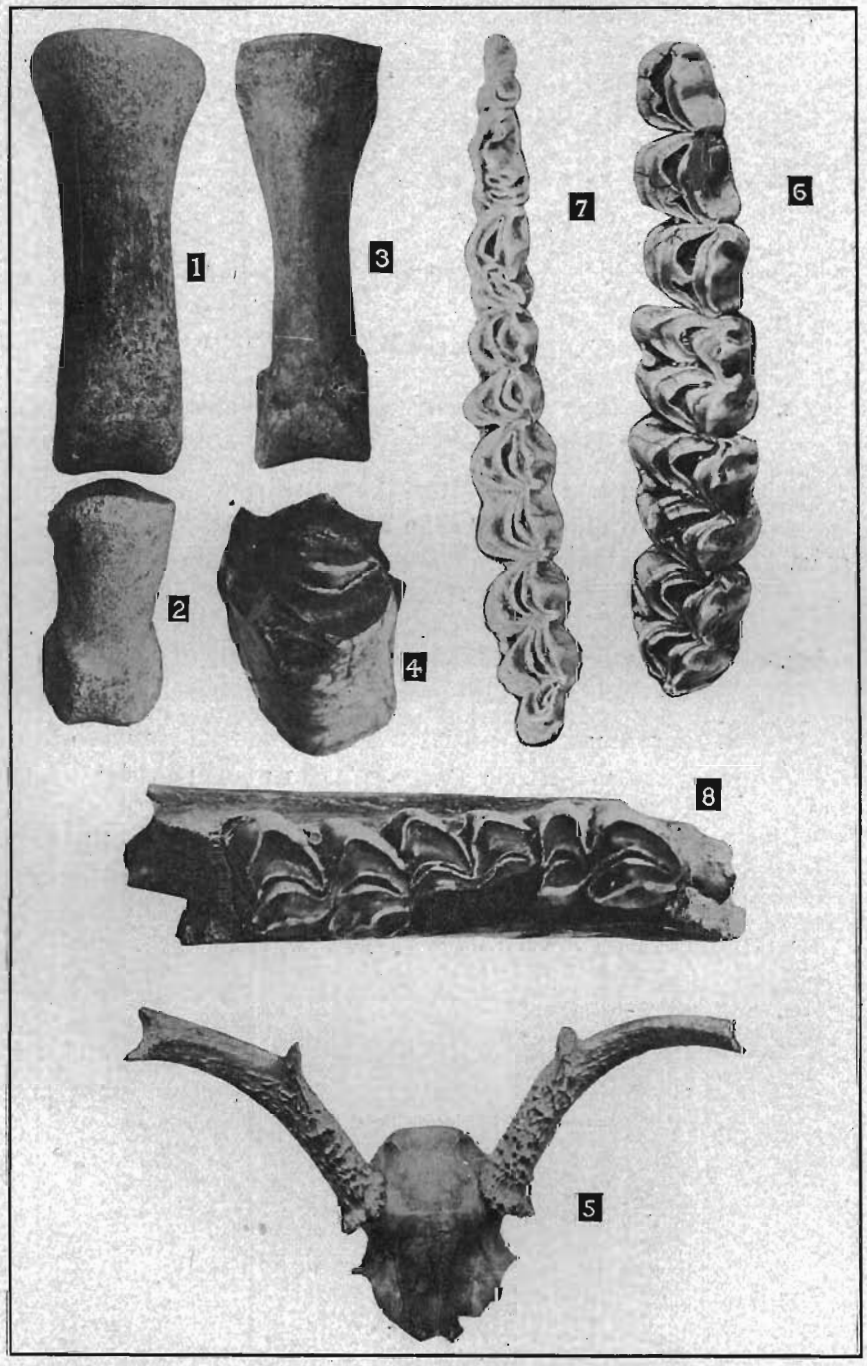
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Plate XXXII.

Figs. 1,2. *Cervalces roosevelti.* Part of skull forming the type. x .185 ..... p. 268

1. Skull and antler seen from behind.
2. Skull and antler seen from in front.

Fig. 3. *Alces shimeki.* Type jaw, seen from outside. x 1 ..... p. 272

Figs. 4,5. *Rangifer muscatinensis?* Fragments of antlers. ..... p. 282

4. Fragment of antler found at Correctionville, Iowa. x 1/4. No. 352, State University of Iowa.
5. Fragment of antler, found at Correctionville, Iowa. x 1/4. No. 351, State University of Iowa.

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2. Lower left premolars and molars.

Fig. 3. *Rangifer muscatinensis?* Fragment of antler found at Muscatine. x .58 ..... p. 281

Fig. 4. *Rangifer muscatinensis?* Fragment of antler. x 1/6. Locality unknown ..... pp. 281, 282

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5. Upper teeth.
6. Lower teeth.

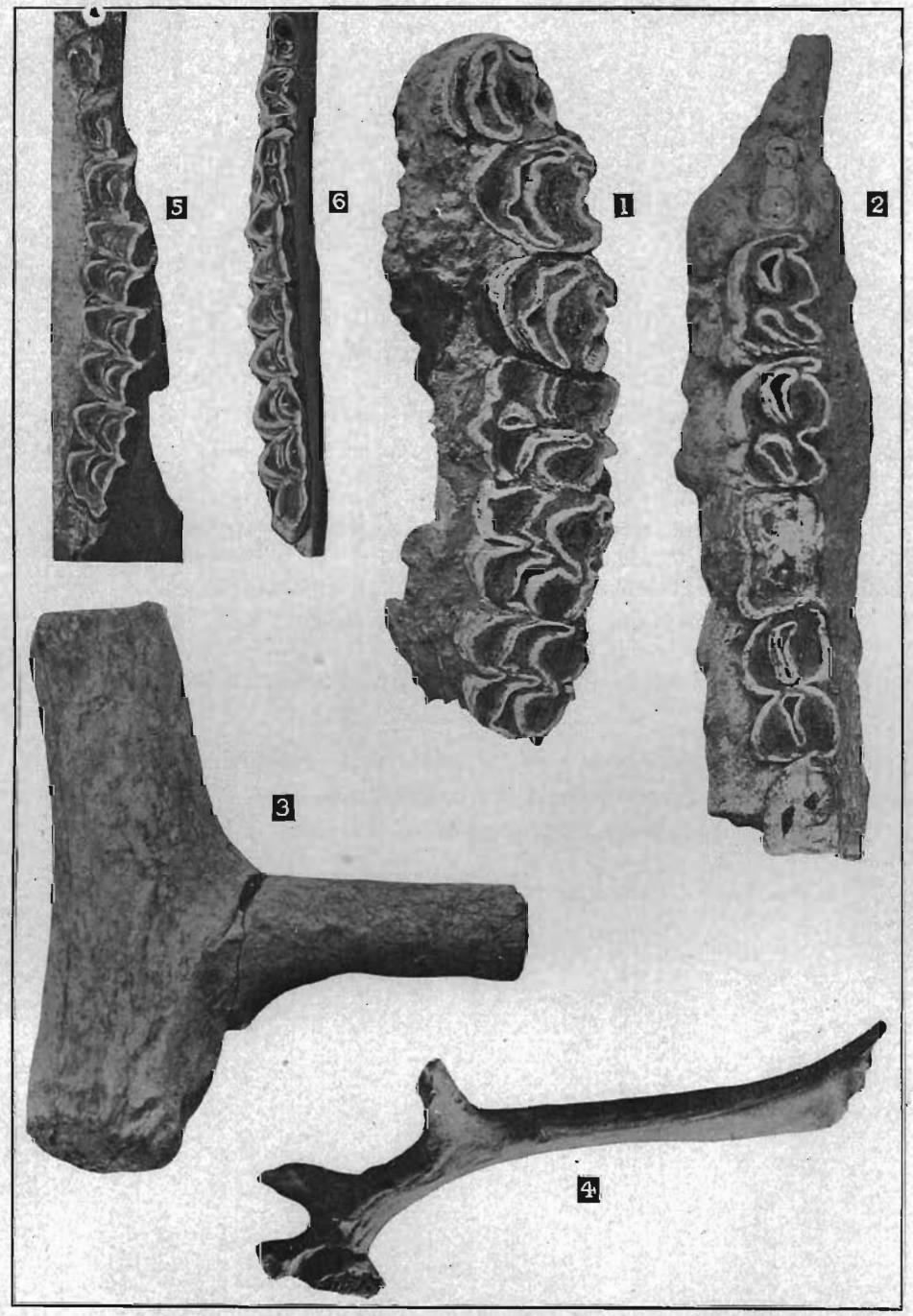
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Plate XXXIV.

Figs. 1,2. *?Aftonius calvini.* Left hinder cannon-bone. x .4 ..... p. 289

1. Bone seen from the inner side.
2. Bone seen from front. Inverted by engraver.

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4. Horn-cores seen from in front. Somewhat less than one-half the natural size.
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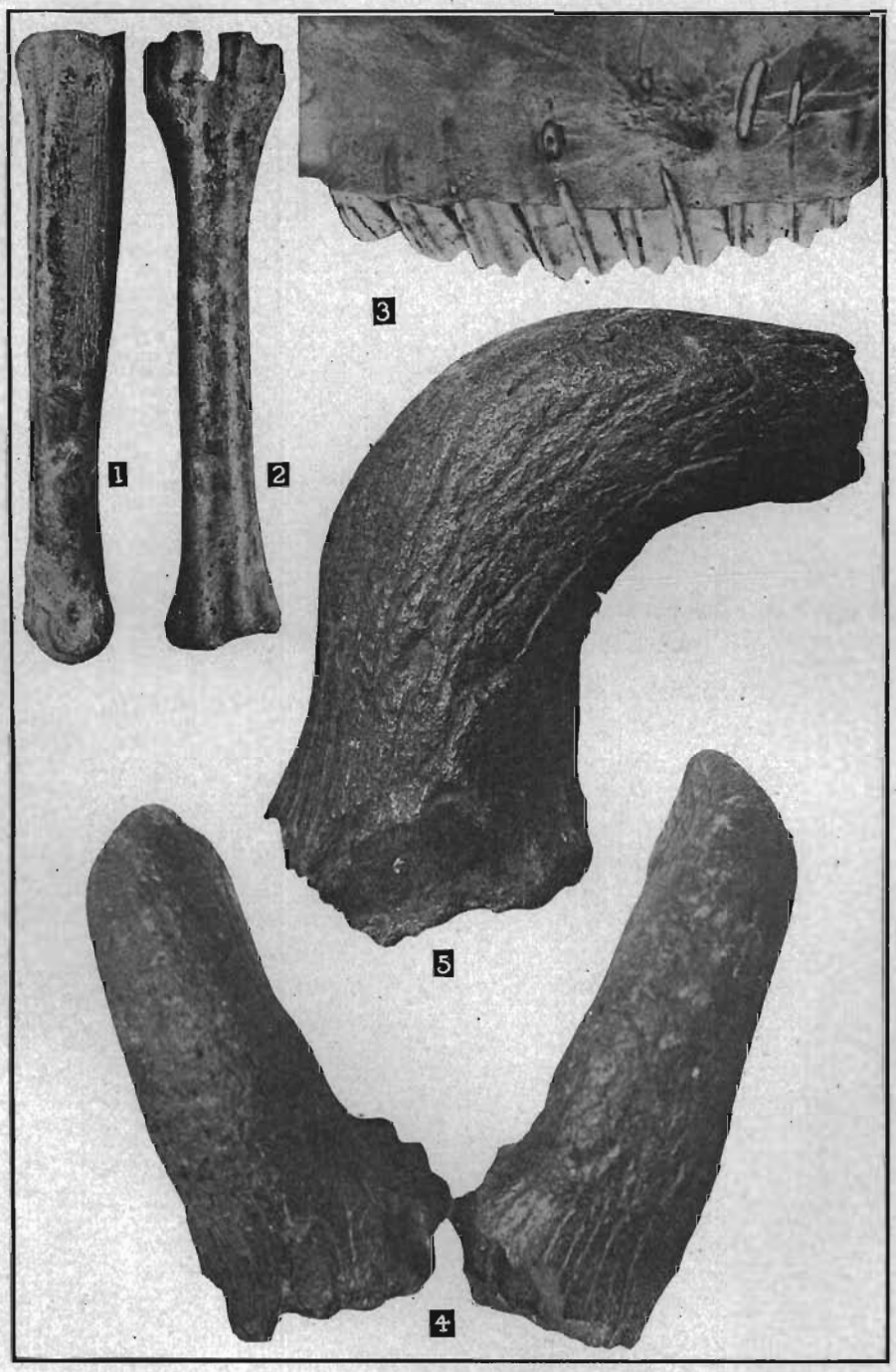
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Plate XXXV.

Figs. 1, 2. *Boötherium bombifrons.* Two views of the skull of the type. x about 1/3. . . . . p. 291

1. Skull seen from the right side.
2. Skull seen from above.

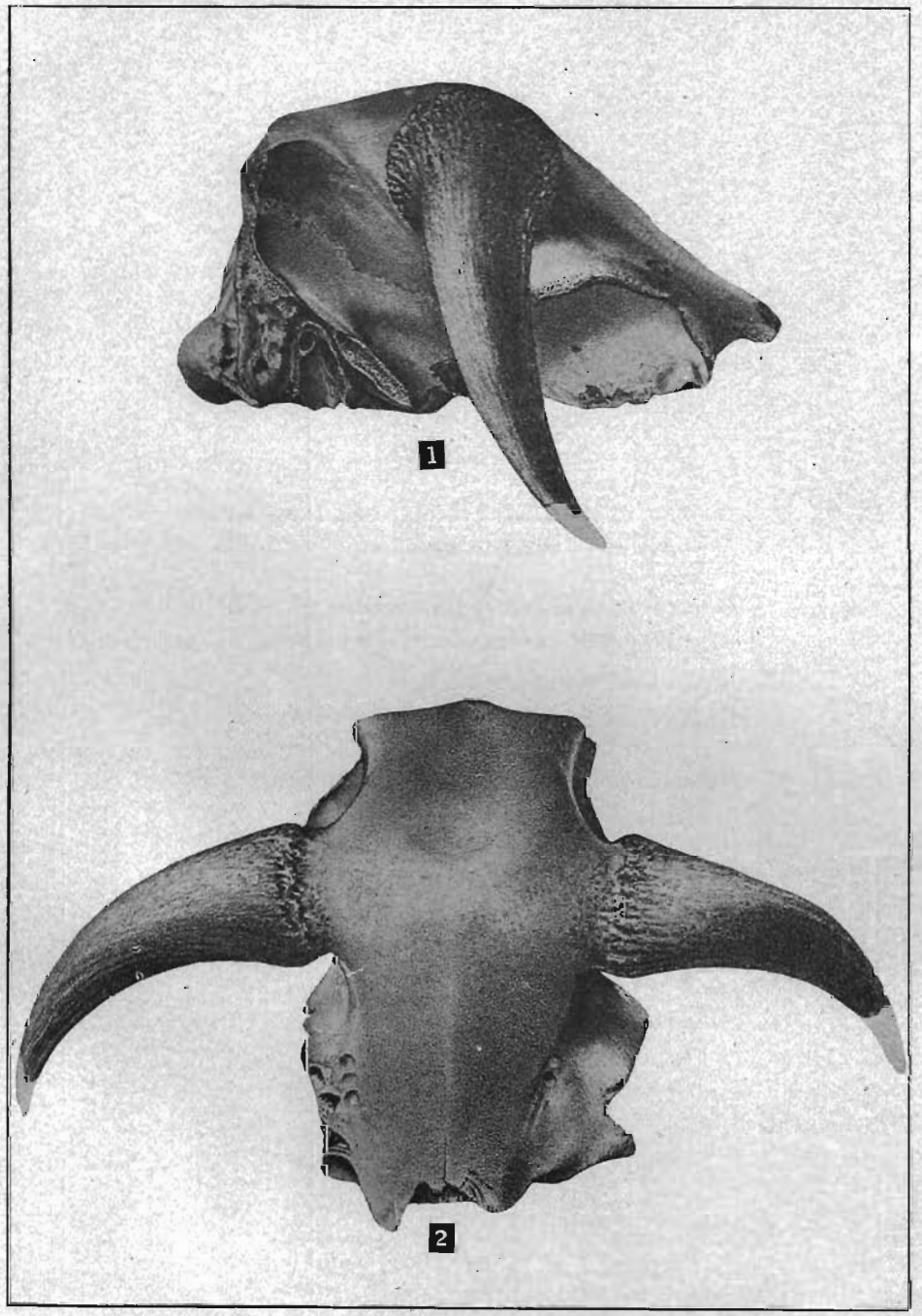
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Plate XXXVI.

Fig. 1. *Ovibos moschatus.* Skull seen from above. x about 1/3. From Osgood.....pp. 294, 297

Figs. 2,3. *Ovibos moschatus.* Two views of skull found in Fayette county, Iowa. x about 1/5..pp. 294, 297

2. Skull seen from above.

3. Skull seen from the left side and above.

Fig. 4. *Symbos cavifrons.* Skull of type seen from the rear. x about .22 ..... p. 298

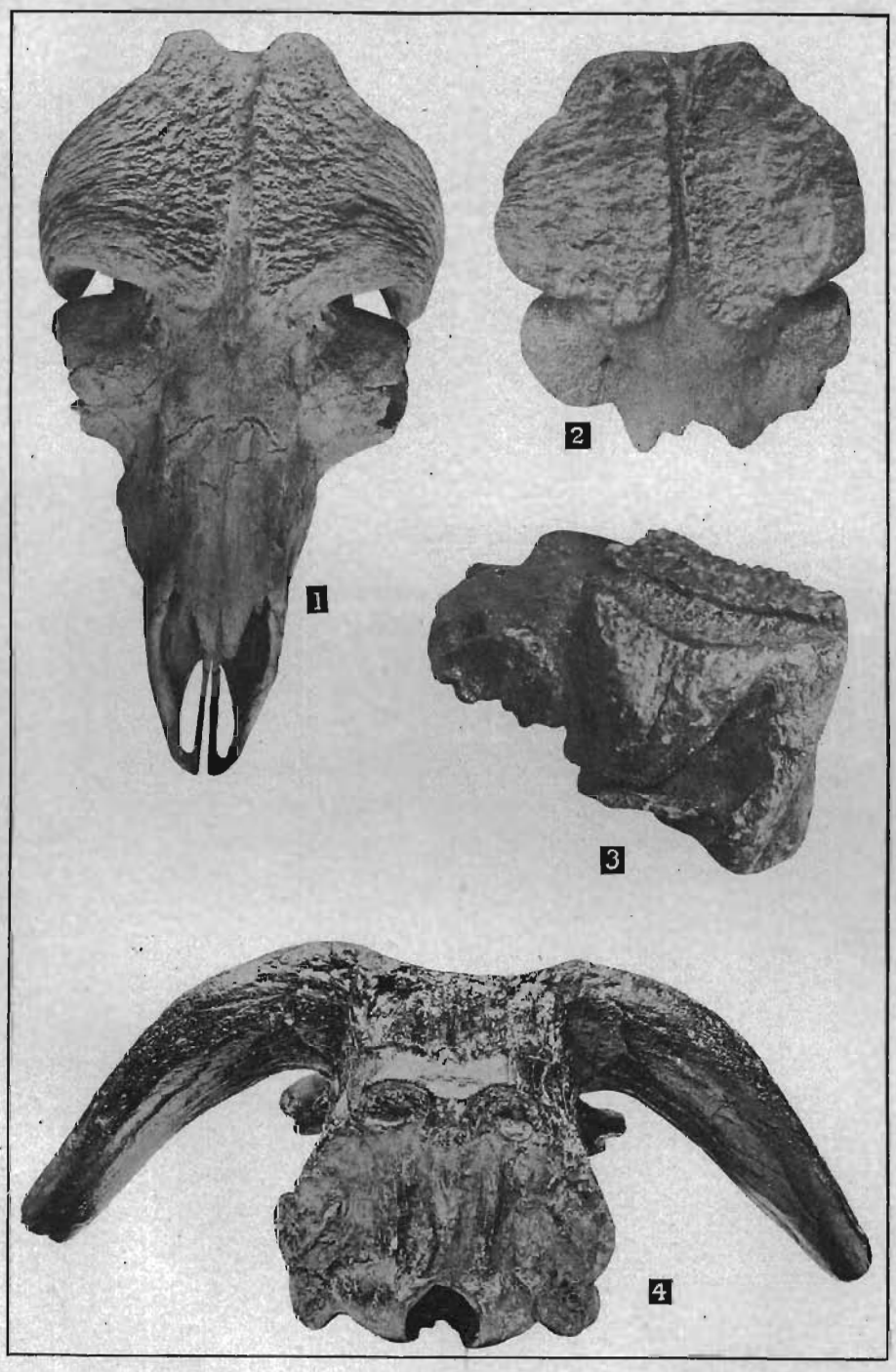
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Plate XXXVII.

Figs. 1, 2. *Symbos tyrrelli.* Two views of the skull forming the type. x about 1/5 . . . . . pp. 302-304

1. Skull from above.
2. Skull from below.

Fig. 3. *Symbos cavifrons.* View of forehead and horn-cores of specimen found near Council Bluffs. x about 1/4 . . . . . p. 305

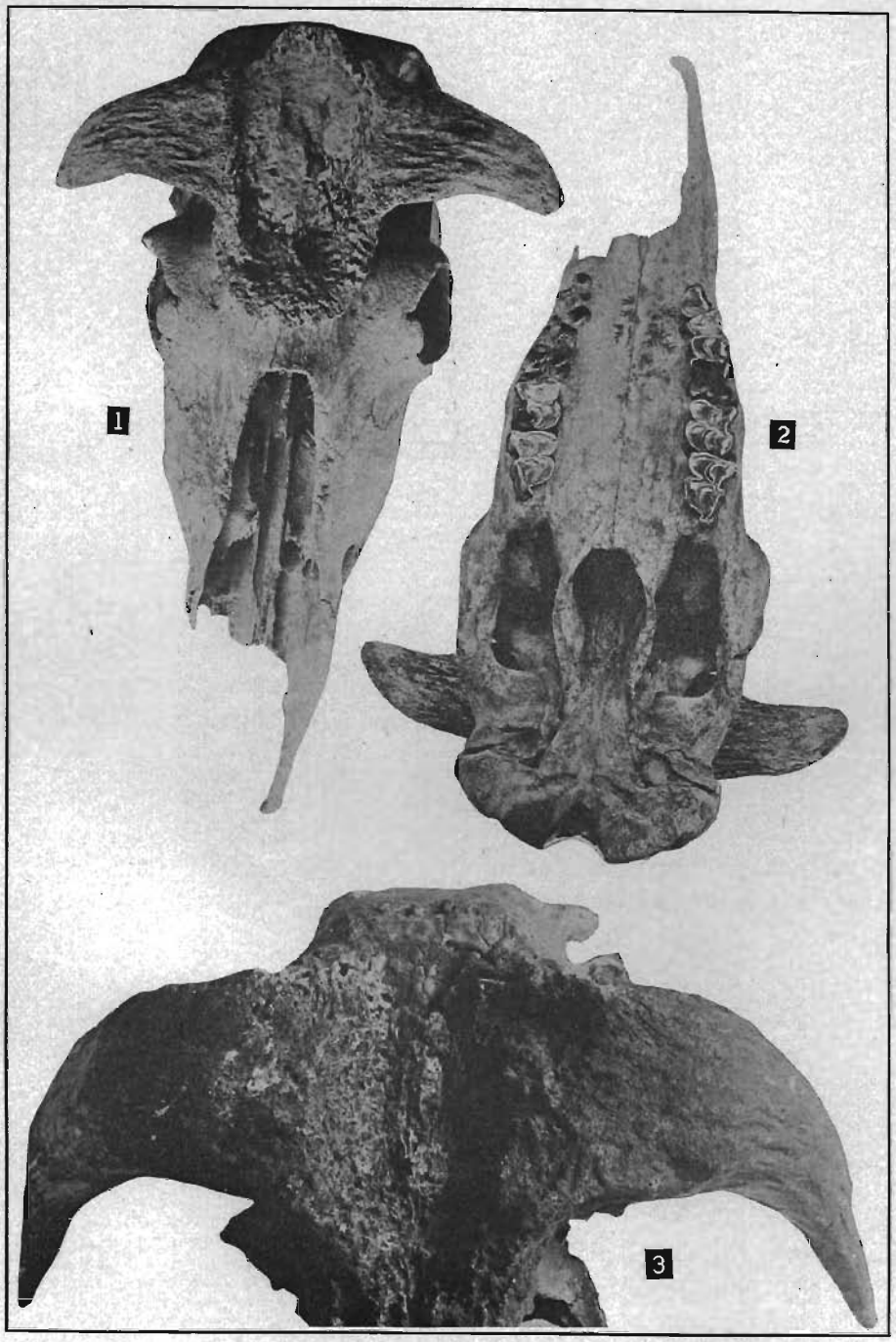
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Plate XXXVIII.

Figs. 1,2. *Bison bison.* Views of skull of an old male. x 1/6 ..... p. 313

1. Skull seen from the side.
2. Skull seen from the rear.

Figs. 3,4. *Bison bison.* Views of grinding surface of upper and lower molars and premolars. x 2/3. p. 313

3. Upper teeth of left side.
4. Lower teeth of right side.

All these figures are from Dr. J. A. Allen's Monograph on North American Bisons.

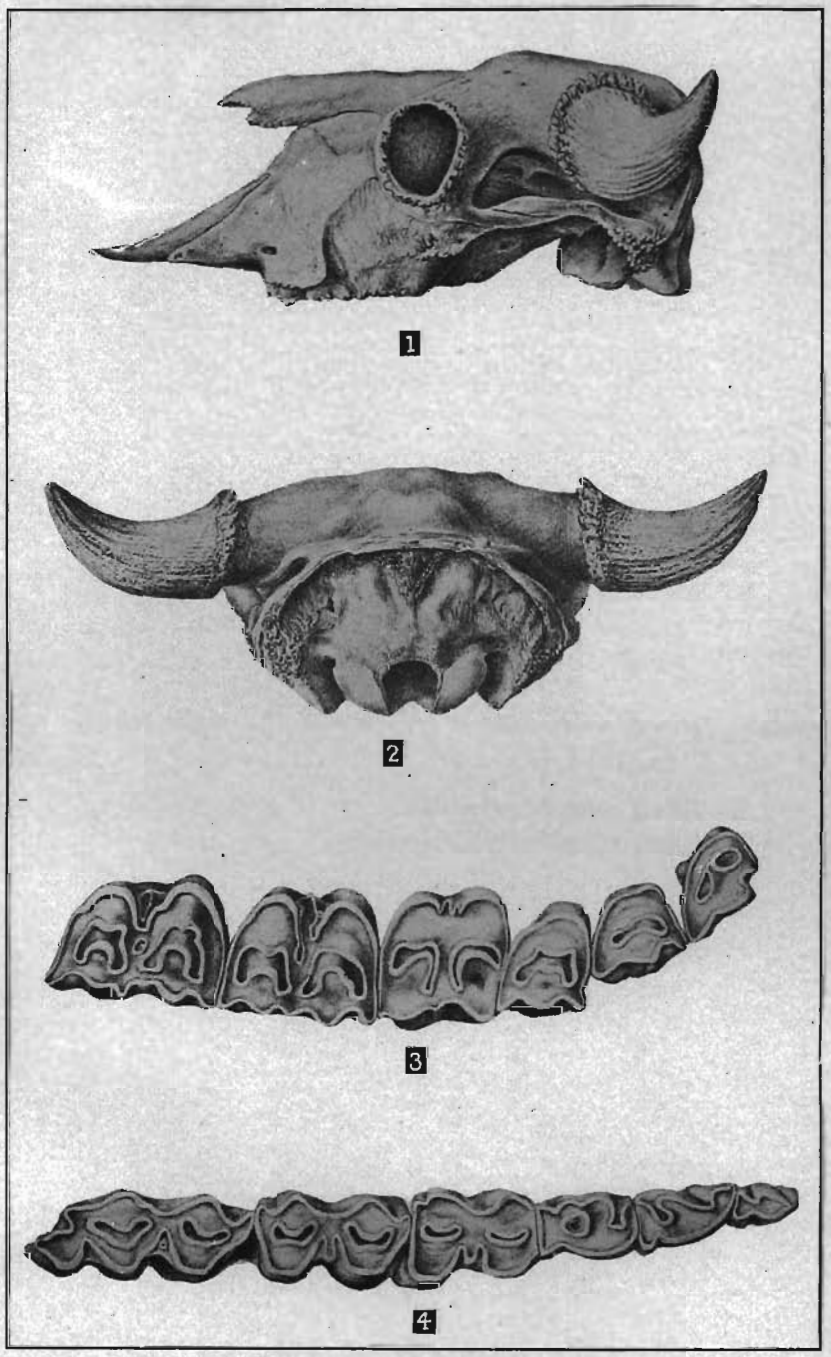
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Plate XXXIX.

Fig. 1. *Bison bison.* Part of skull of a young animal found at Deloit, Crawford county, Iowa. x .22 ..... p. 315

Figs. 2,3. *Bison occidentalis.* Views of the skull forming the type. x 1/7 ..... p. 319

2. Skull seen from above.
3. Skull viewed from behind.

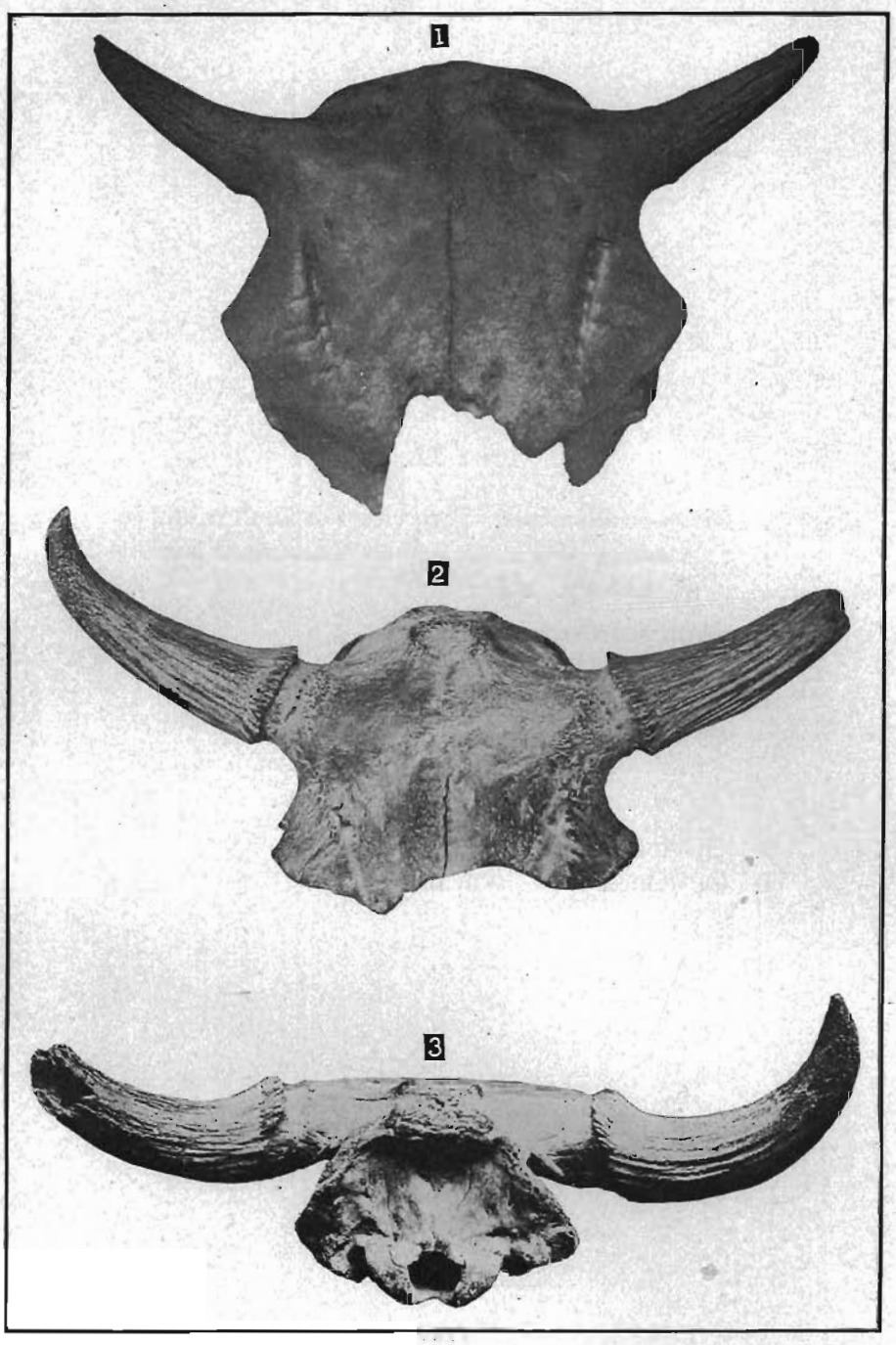
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Plate XL.

Figs. 1,2. *Bison occidentalis.* Two views of skull found in Alaska; now in American Museum of Natural History. x 1/9 ..... p. 319

1. Skull seen from above.
2. Skull seen from the rear.

Figs. 3,4. *Bison occidentalis.* Left side of skull and horn-core of specimen found in Hamilton county, Iowa. x 1/5 ..... pp. 82, 323

3. Specimen seen from above.
4. Specimen seen from behind.

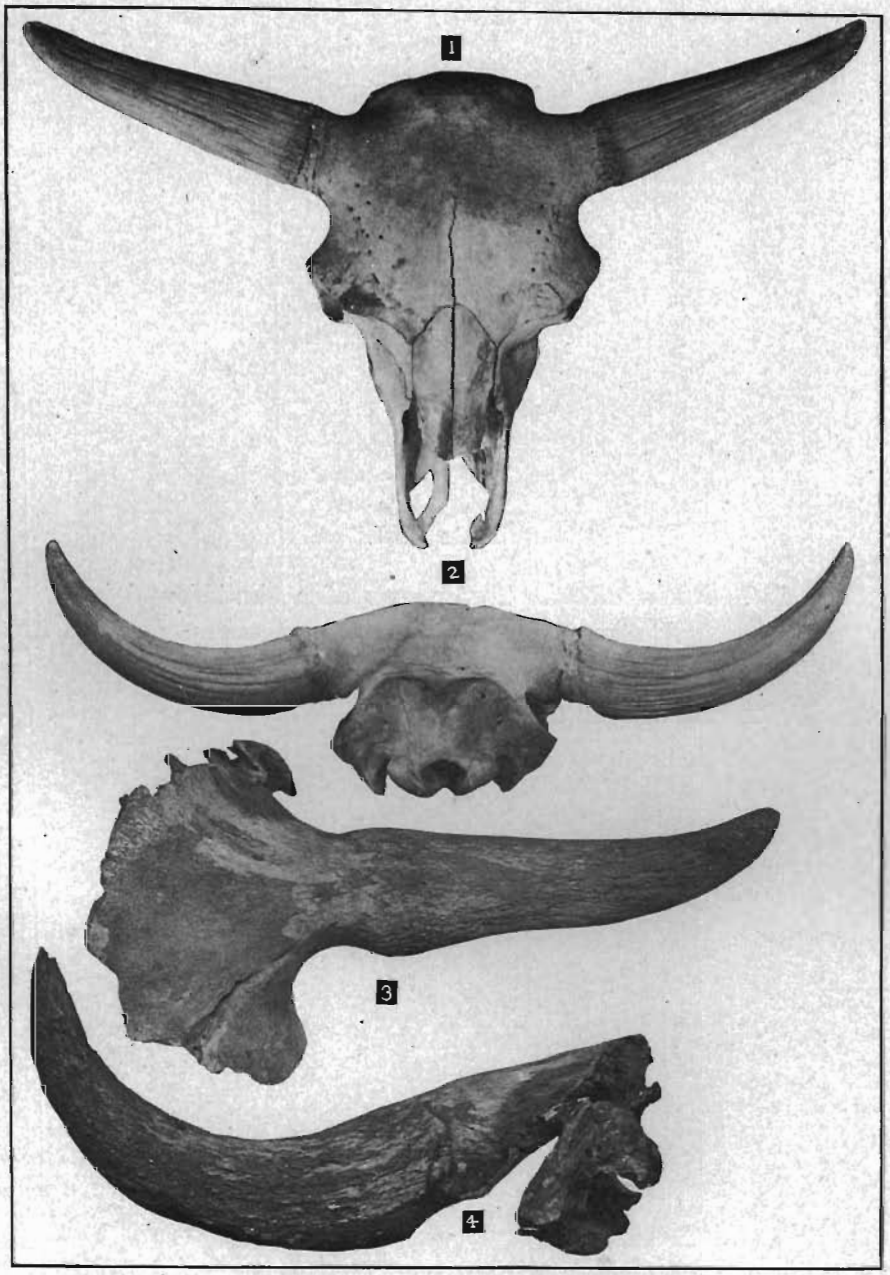
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Plate XLI.

Figs. 1,2. *Bison alleni.* Two views of a skull found in Alaska; now in National Museum. x .12. . p. 326

1. Skull seen from above.
2. Skull seen from the rear.

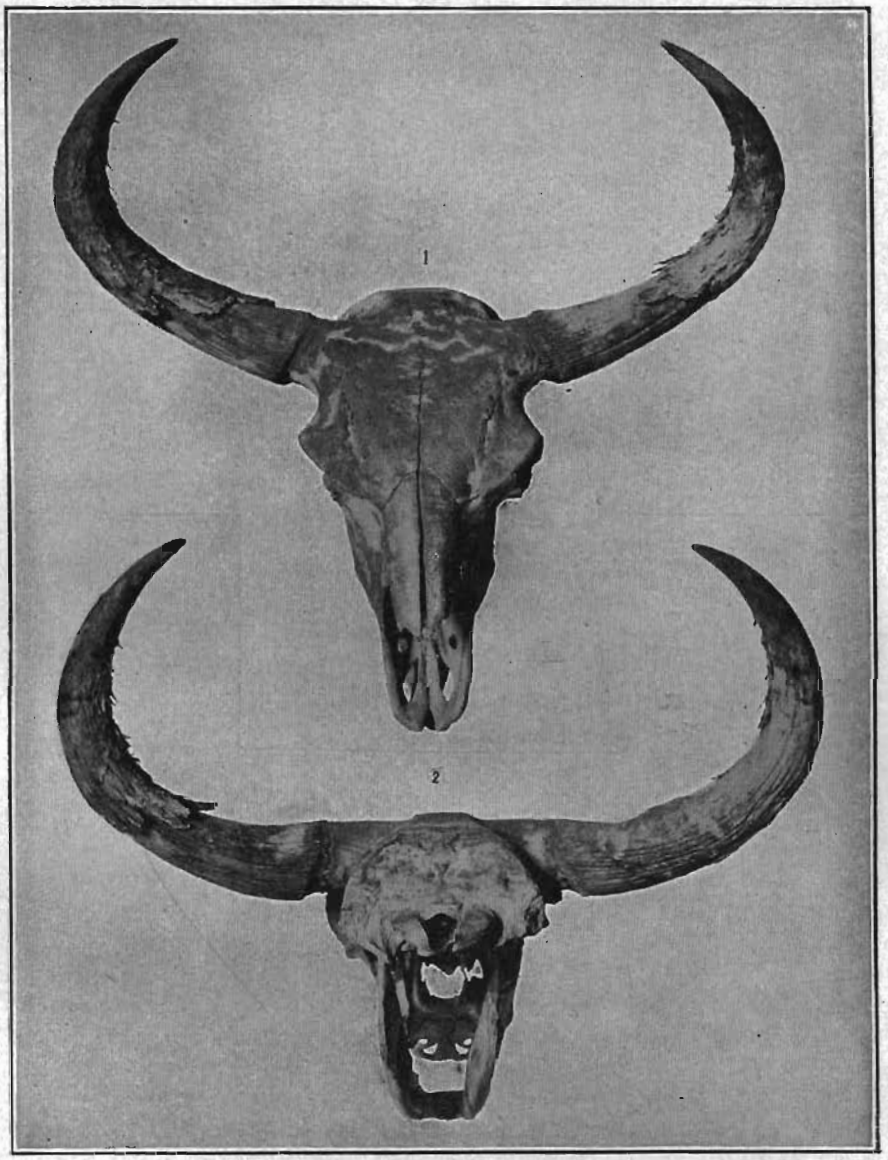
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Plate XLII.

Fig. 1. *Bison latifrons.* View of part of skull and the horn-cores, to show the curvature of the latter. x 1/12. Specimen in Cincinnati Society Natural History ..... p. 327

Figs. 2,3. *Bison regius.* Two views of skull of the type. x 1/12. Specimen in American Museum Natural History, New York ..... p. 237

2. Skull seen from the rear.
3. Skull seen from above.

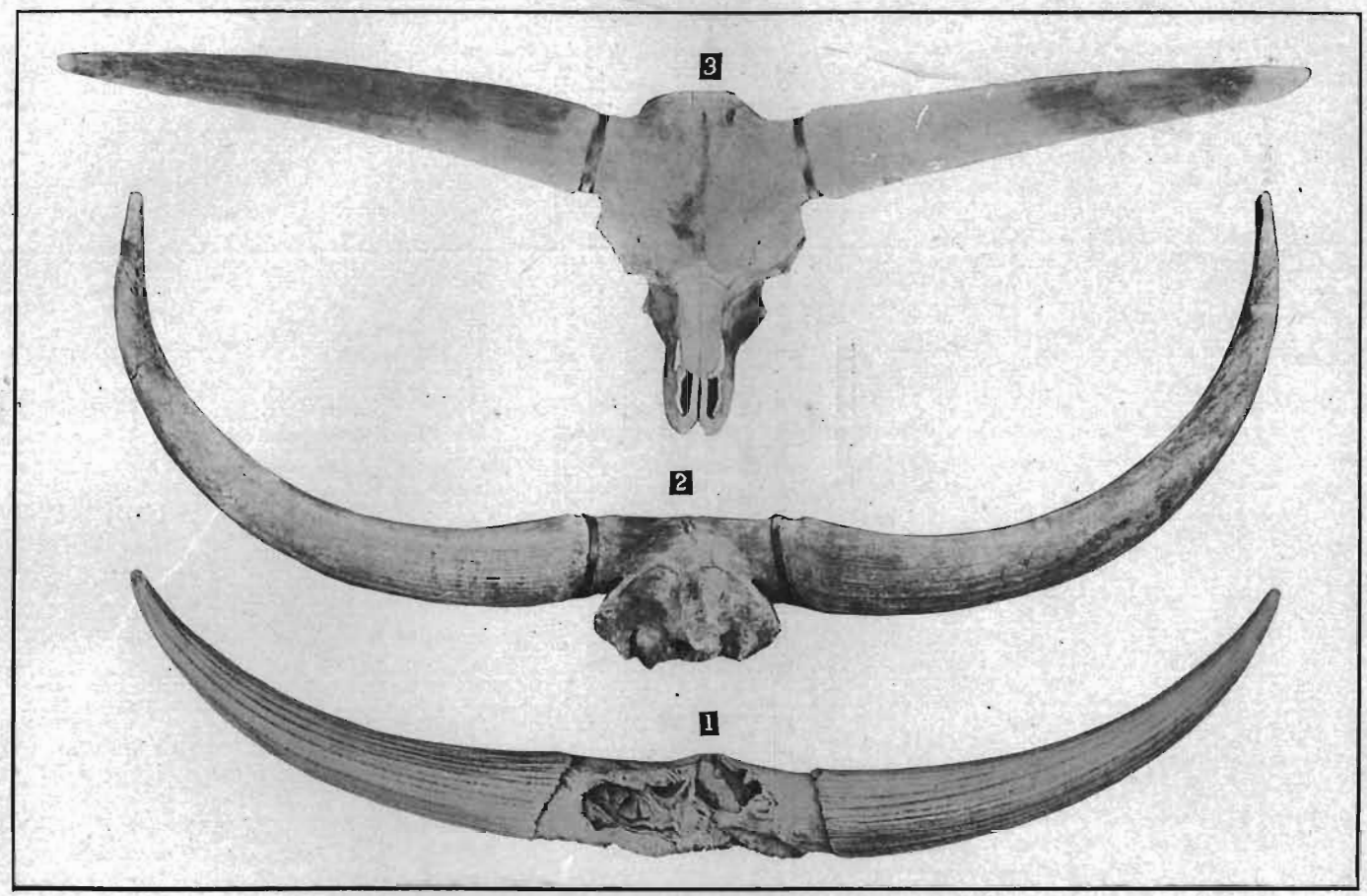
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Plate XLIII.

Figs. 1,2. *Mammut americanum.* Two views of skull of specimen in the National Museum..... .....pp. 333, 334, 335, 370

1. Palatal view of skull.
2. Lower jaw seen from above.

Fig. 3. *Mammut americanum.* Upper left third molar, seen from outside. x 1/2. No. 2220, National Museum ..... p. 338

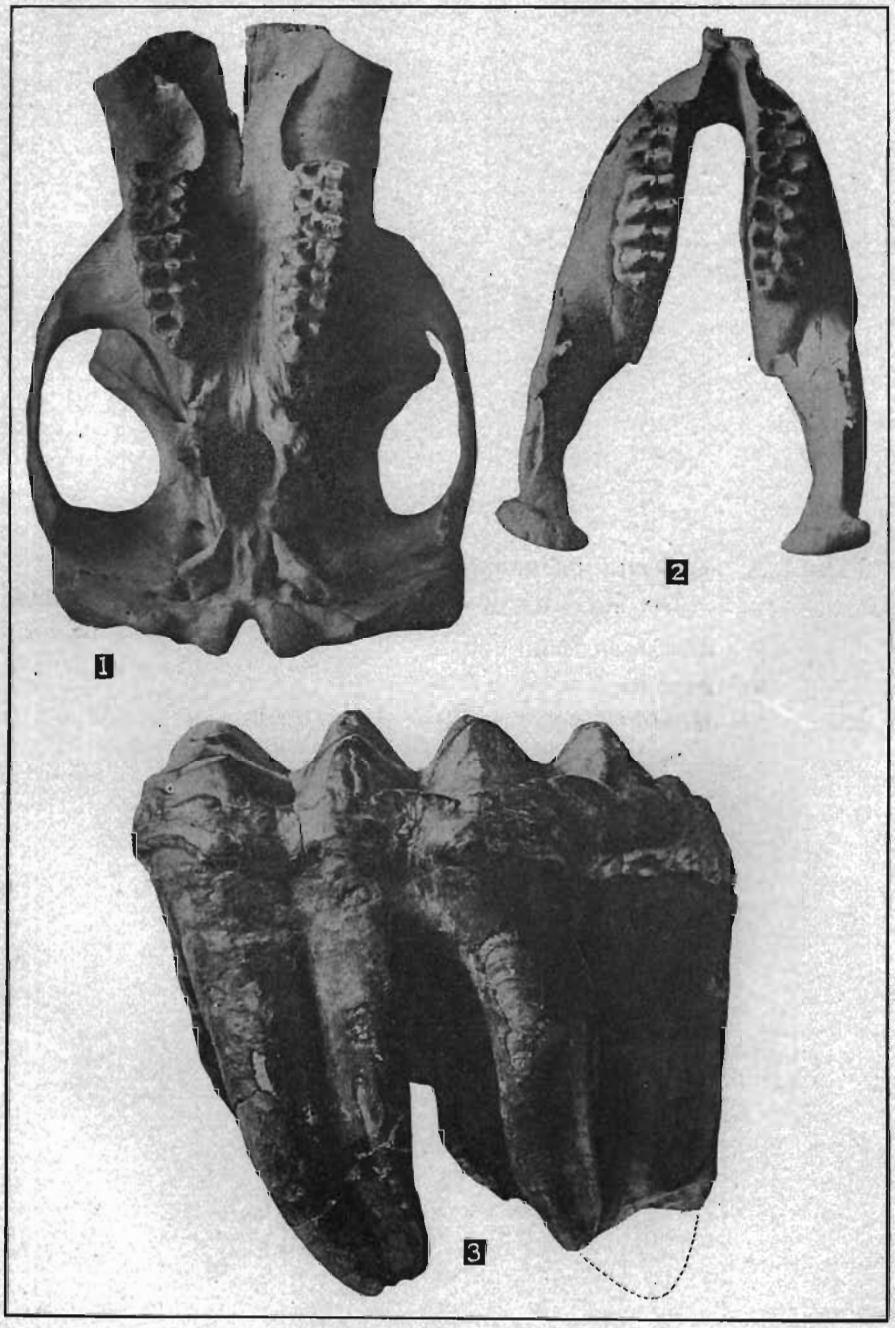
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Plate XLIV.

Figs. 1,2. *Mammut progenium.* Two views of the lower jaw forming the type. x 1/7 . . . . . p. 368

1. Jaw seen from above.
2. Jaw seen from left side.

Fig. 3. *Mammut americanum.* Crown view of upper right hindermost molar. x .46. No. 2218, National Museum . . . . . p. 339

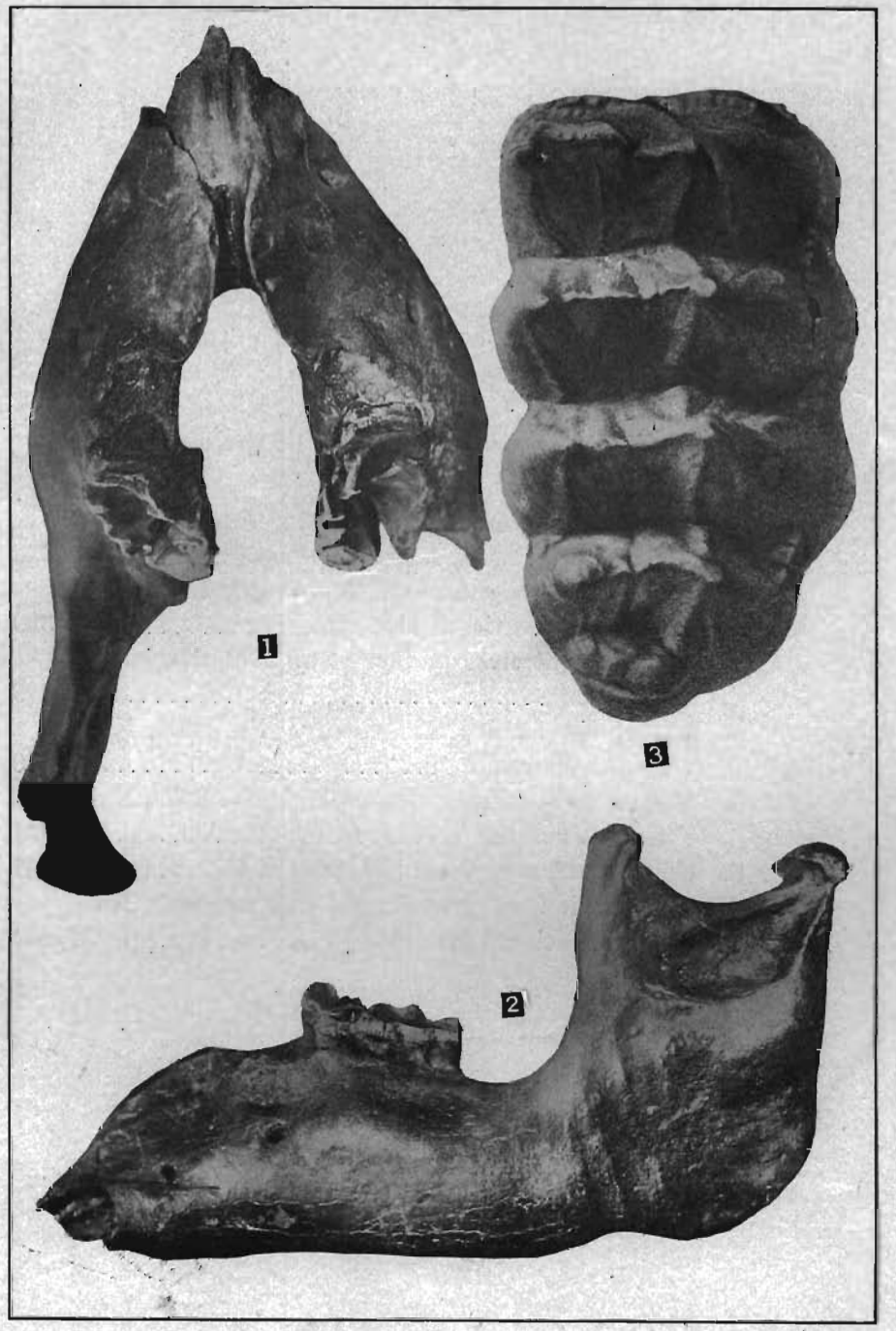
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Plate XLV.

Figs. 1-7. *Mammut americanum.* Views of various teeth. x 1/2.

1. Upper left second molar, front end toward the right. No. 2261, National Museum.....p. 339
2. Upper left second molar. Shows grinding face. No. 2258, National Museum.....p. 339
3. Upper right first molar. No. 2243, National Museum ..... p. 339
4. Upper right third milk molar. No. 2230, National Museum .....p. 340
5. Upper right second milk molar. No. 6689, National Museum .....p. 341
6. Same tooth seen from the outer side.....p. 341
7. Crown view of lower right last molar. No. 2221, National Museum .....pp. 337, 341

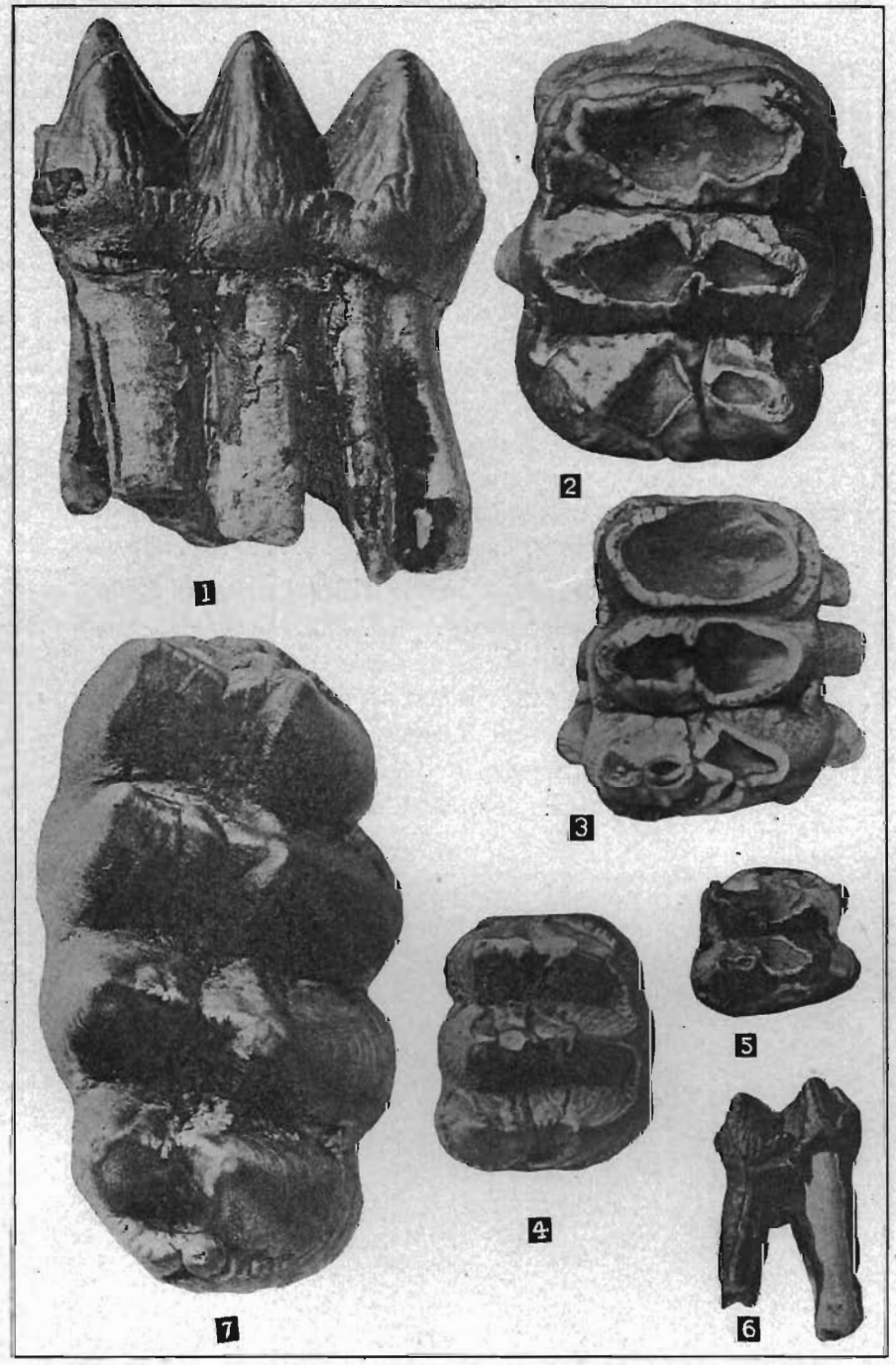
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Plate XLVI.

Figs. 1-3. *Mammut americanum.* Views of three lower last molars. x 1/2 ..... pp. 337, 341, 342

1. Lower right last molar from below, to show great pulp cavity. No. 2221, National Museum.
2. Lower left last molar, seen from above. No. 2384, National Museum.
3. Lower right last molar, seen from outer, or right side. No. 5101, National Museum.

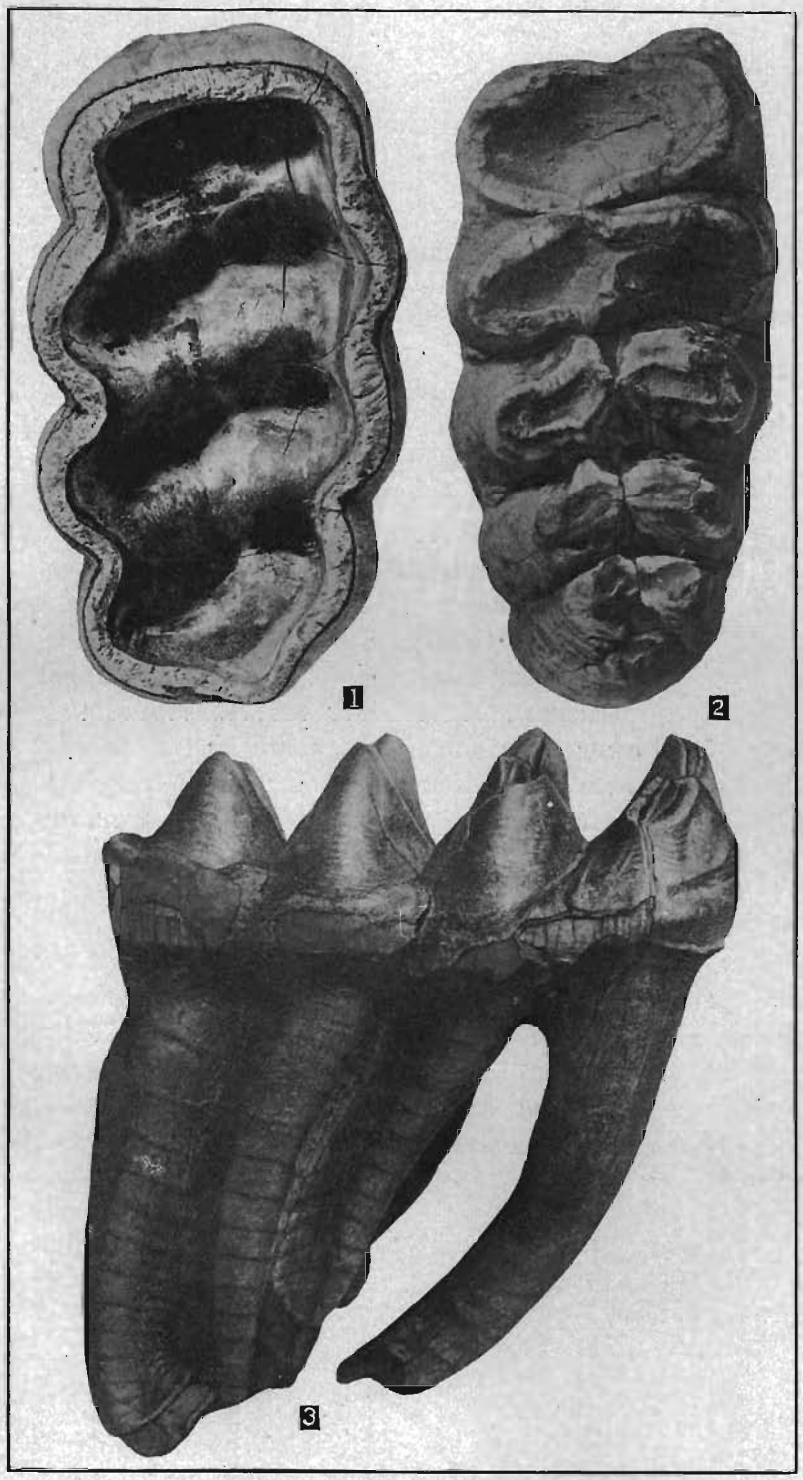
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Plate XLVII.

Figs. 1-10. *Mammut americanum.* Views of various teeth.

1. Lower right second molar. x .36. No. 342, National Museum ..... p. 343
2. Lower left second molar. x .47. No. 2228, National Museum. The front of the tooth is toward the left ..... p. 343
3. Lower left first molar. x .44. No. 2233, National Museum ..... p. 343
4. Lower right third milk molar. Shows a moderately worn tooth. x 1/2. No. 2231, National Museum ..... p. 344
5. Lower right third milk molar. x 1/2. Specimen in National Museum from Virginia. Shows a wholly unworn tooth, seen from the side. ..... pp. 344, 345
6. Same tooth seen from above. x 1/2. .... pp. 344, 345
7. Lower right second milk molar. x .46. No. 6690, National Museum ..... p. 345
8. Lower left second milk molar, much worn. x .48. No. 6701, National Museum ..... p. 346
9. Lower right first milk molar. x .48. No. 4986, National Museum ..... p. 346
10. Same tooth seen from the outer side. x .48. ... p. 346

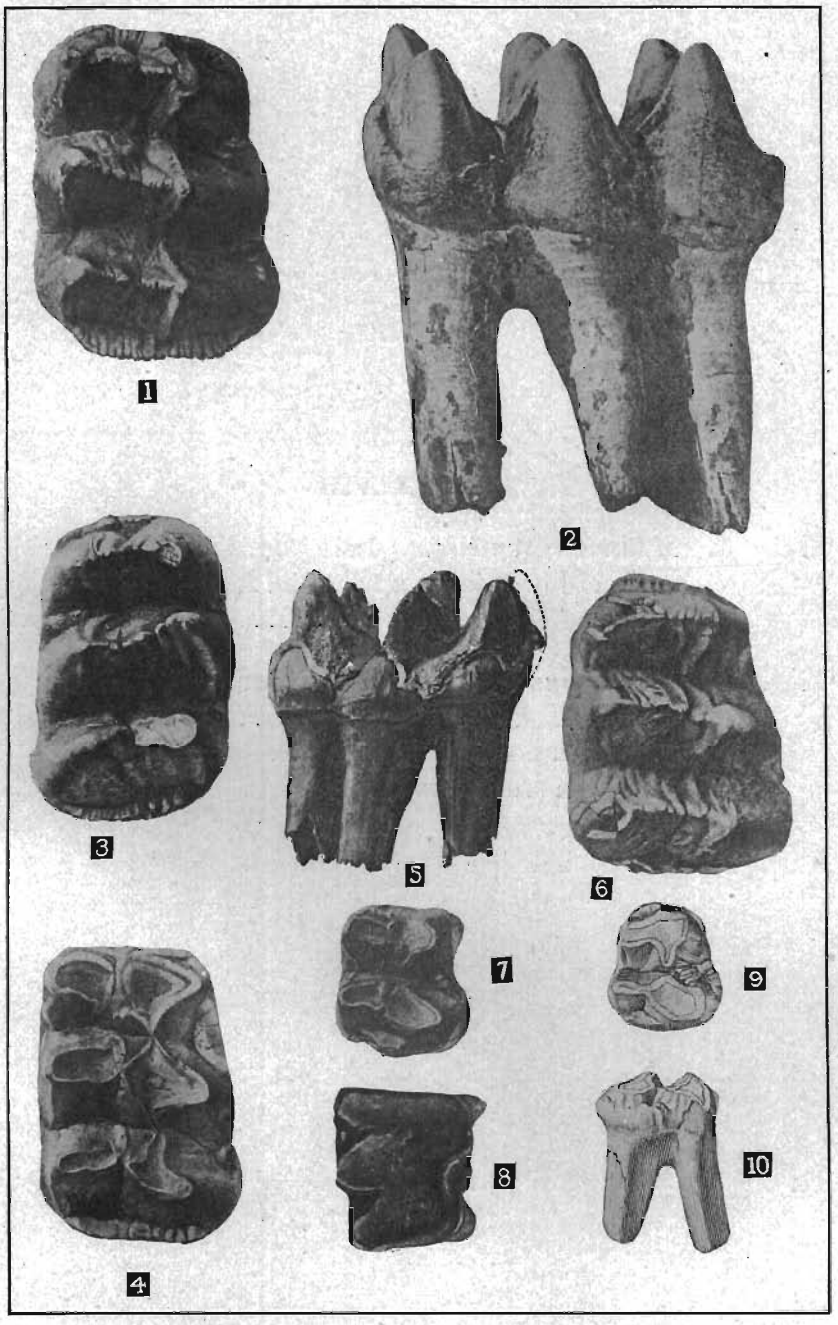
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Plate XLVIII.

Fig. 1. *Mammut progenium.* Left ramus and symphysis of lower jaw. x 1/7. No. 2, State University of Iowa.....p. 372

Figs. 2,3. *Rhabdobunus mirificus.* Left ramus of the lower jaw. x 1/4. After Leidy .....p. 375

2. Jaw seen from the outer side.
3. Jaw seen from above.

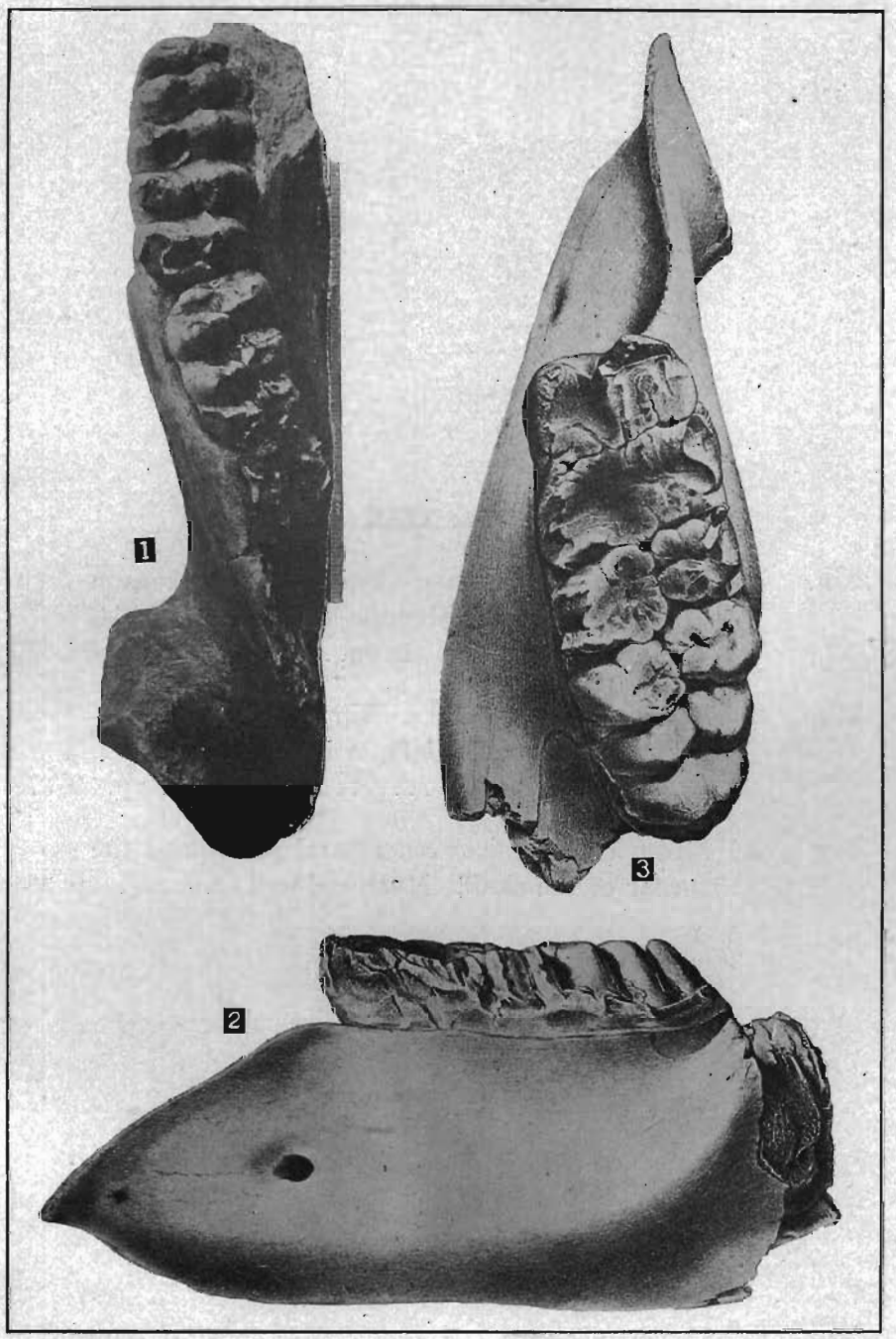
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Plate XLIX.

Fig. 1. *Mammut americanum.* Tusk from Wilkenson well, Mapleton, Monona county. No. 234, State University of Iowa.....pp. 68, 386

Fig. 2. *Rhabdobunus mirificus.* Upper right last molar, seen from the left, or inner, side. x 1/2. ..... pp. 59, 378

Fig. 3. *?Mammut americanum.* Basal portion of the rear of the skull. Much reduced.....p. 384

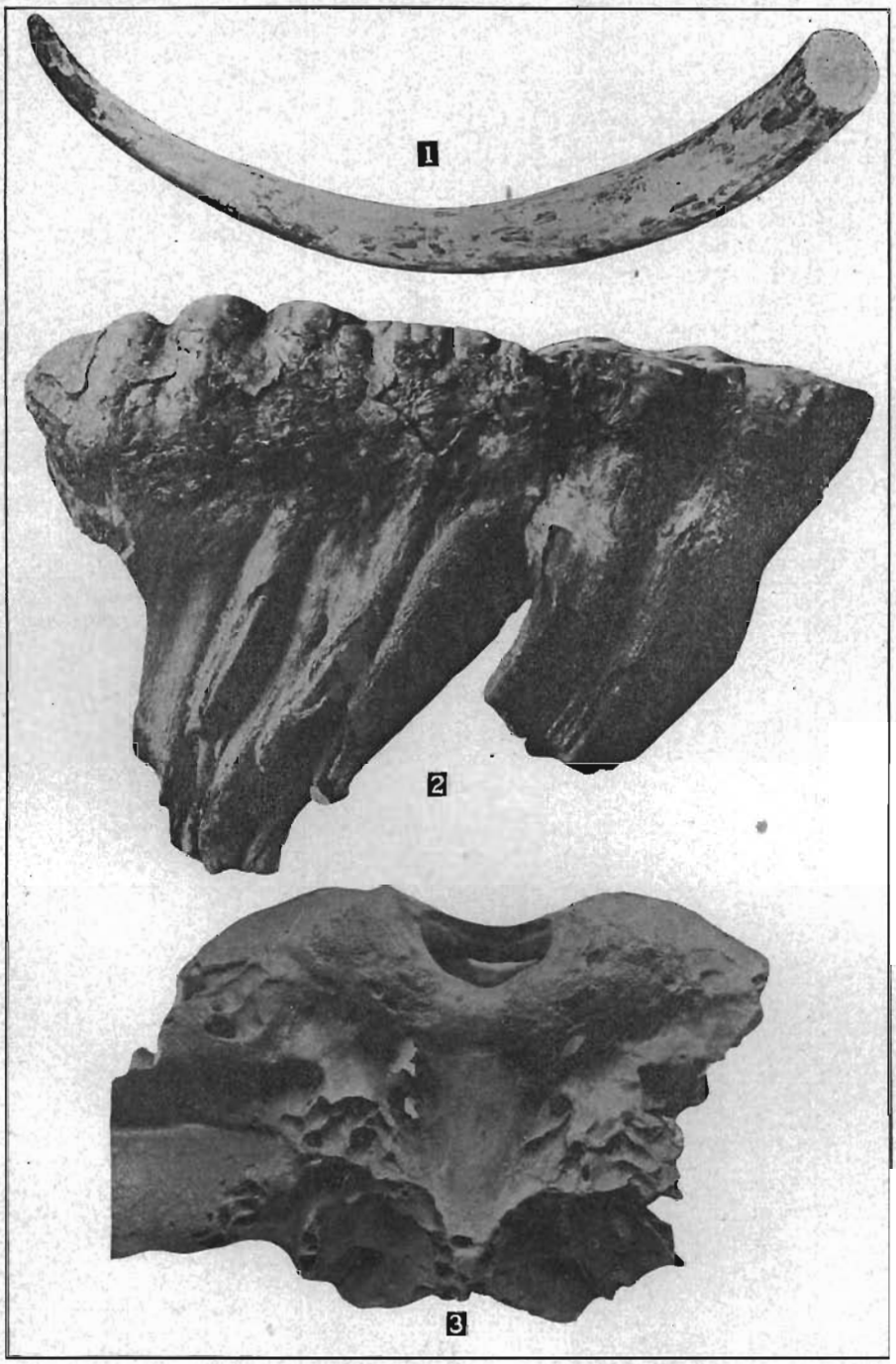
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Plate L.

Rhabdobunus mirificus. Upper right last molar, showing the grinding surface. x 4/5....p. 378

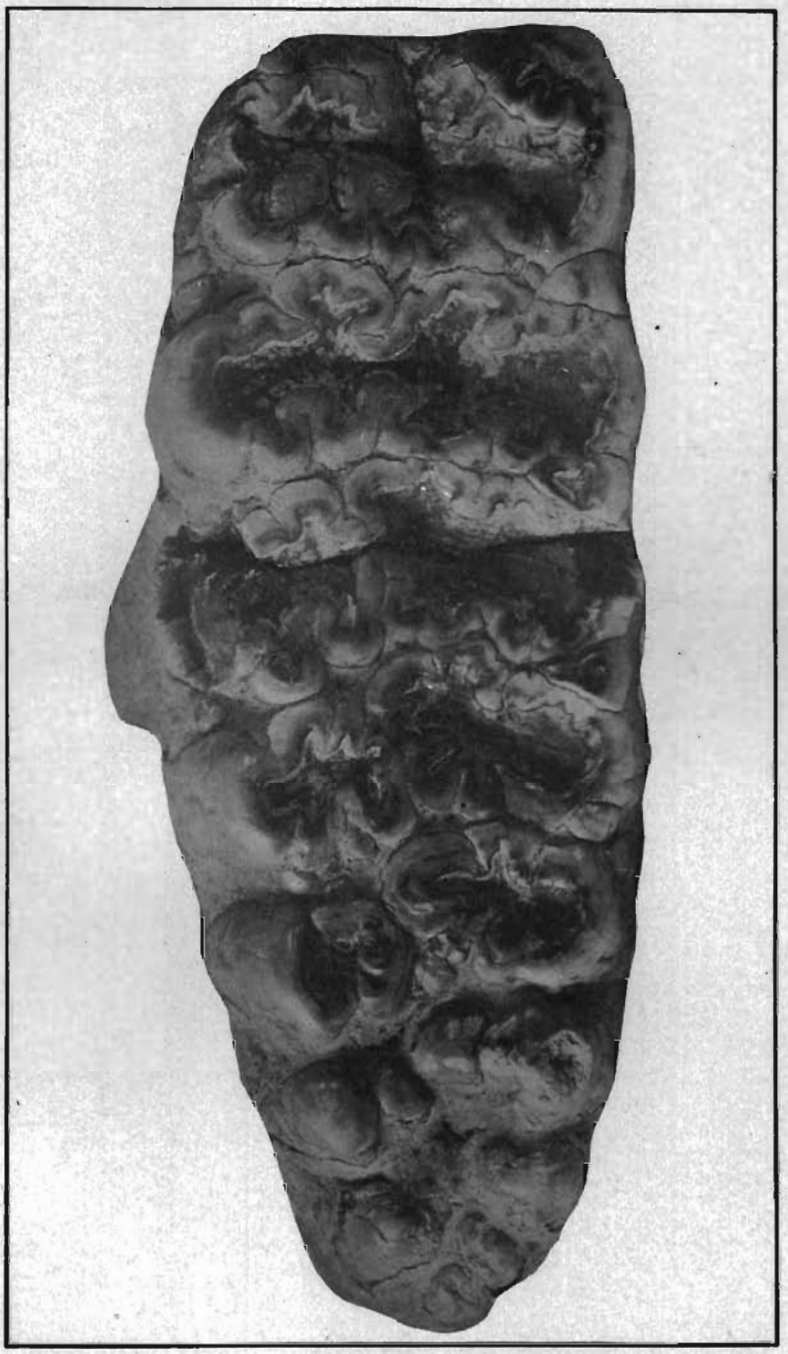

Plate LI.

Figs. 1,2. *Mammut americanum.* Upper left last molar. x 2/3. No. 12, State University of Iowa. ..... pp. 383, 384

1. Tooth presenting the grinding surface.
2. Tooth presenting the inner face. The front end is toward the left.

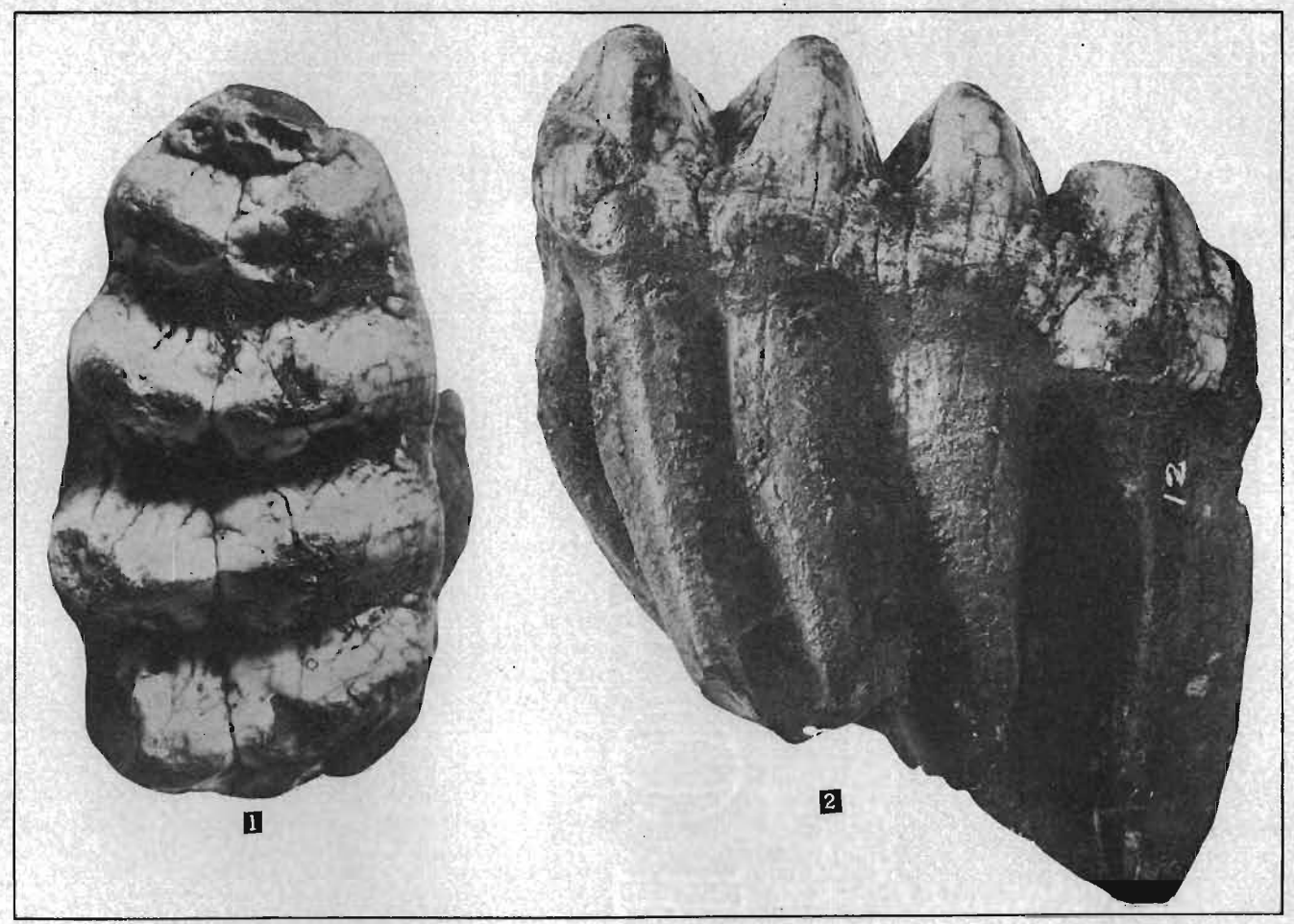
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Plate LII.

Fig. 1. *Mammut americanum.* Scapula found, with other bones, near Wilton, Muscatine county. x about 1/12..... pp. 79, 355, 388

Fig. 2. *Mammut progenium?* Left ramus and symphysis of lower jaw. x 1/6. No. 2, State University of Iowa.....p. 372

Fig. 3. *Mammut progenium.* Supposed lower tusk. Proximal end at left. x .23. No. 25, State University of Iowa.....p. 370

Fig. 4. *Elephas primigenius.* Longitudinal section of part of tusk from Alaska. Much reduced...p. 392

Figs. 5,6. *Elephas primigenius.* Upper first milk molar. x 1. From A. Leith Adams.....p. 401

5. View from the side. The front is toward the right.
6. View of the grinding surface.

Figs. 7,8. *Elephas primigenius.* Lower first milk molar. x 1. From A. Leith Adams.....p. 401

7. View of grinding surface.
8. View from the side.

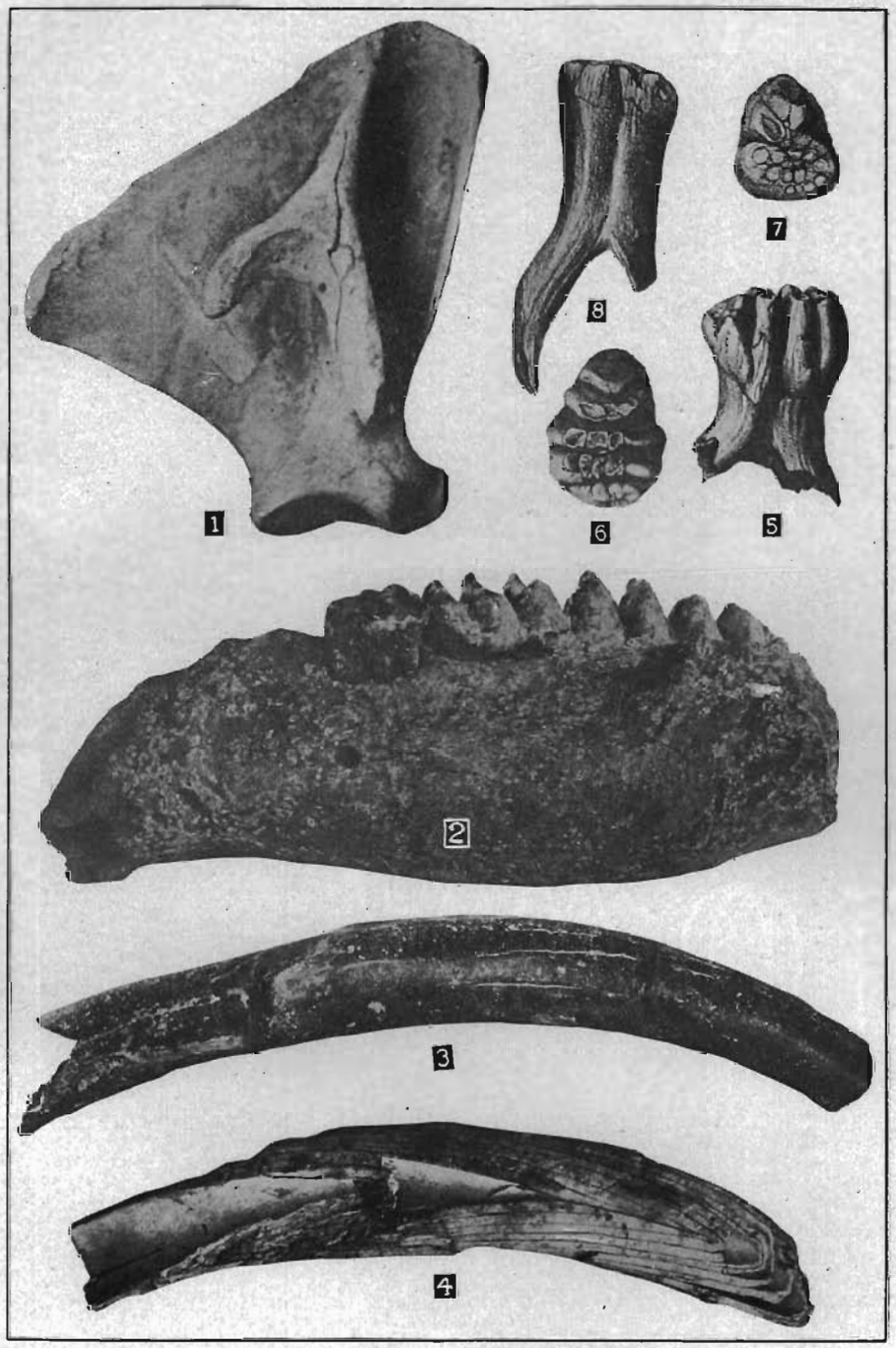
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Plate LIII.

Glacial map showing where specimens of mastodons have been found in Iowa.....p. 379

Wisconsin
Iowan
Illinoian.
Kansan.
Driftless.
Old Channel
Moraines.

Plate LIV.

Figs. 1,2. *Elephas primigenius.* Two views of upper second milk molar. x 1/2. From A. Leith Adams ..... p. 401

1. View of tooth from probably the inner face. Front of tooth toward the right.
2. View of the grinding surface.

Figs. 3,4. *Elephas primigenius.* Lower left second milk molar. x 1/2.....pp. 401, 403, 407

3. Tooth seen from the inner face, the front toward the left.
4. View of the grinding surface, the front above.

Fig. 5. *Elephas primigenius.* Lower second milk molar, unworn. x a little more than 1/2. Front of tooth toward the left. From A. Leith Adams ..... p. 402

Fig. 6. *Elephas primigenius.* Upper right third milk molar. Shows the inner face. x 1/2. From Ohio. No. 4836, National Museum.....p. 402

Figs. 7,8. *Elephas primigenius.* Lower right last milk molar, partially worn. x 1/2. From A. Leith Adams ..... p. 403

7. Shows the inner face and the partially developed roots.
8. View of the grinding surface.

Fig. 9. *Elephas primigenius.* The lower last milk molar. x 1/2. No. 6558, National Museum. Two or three rear plates are restored.....p. 403

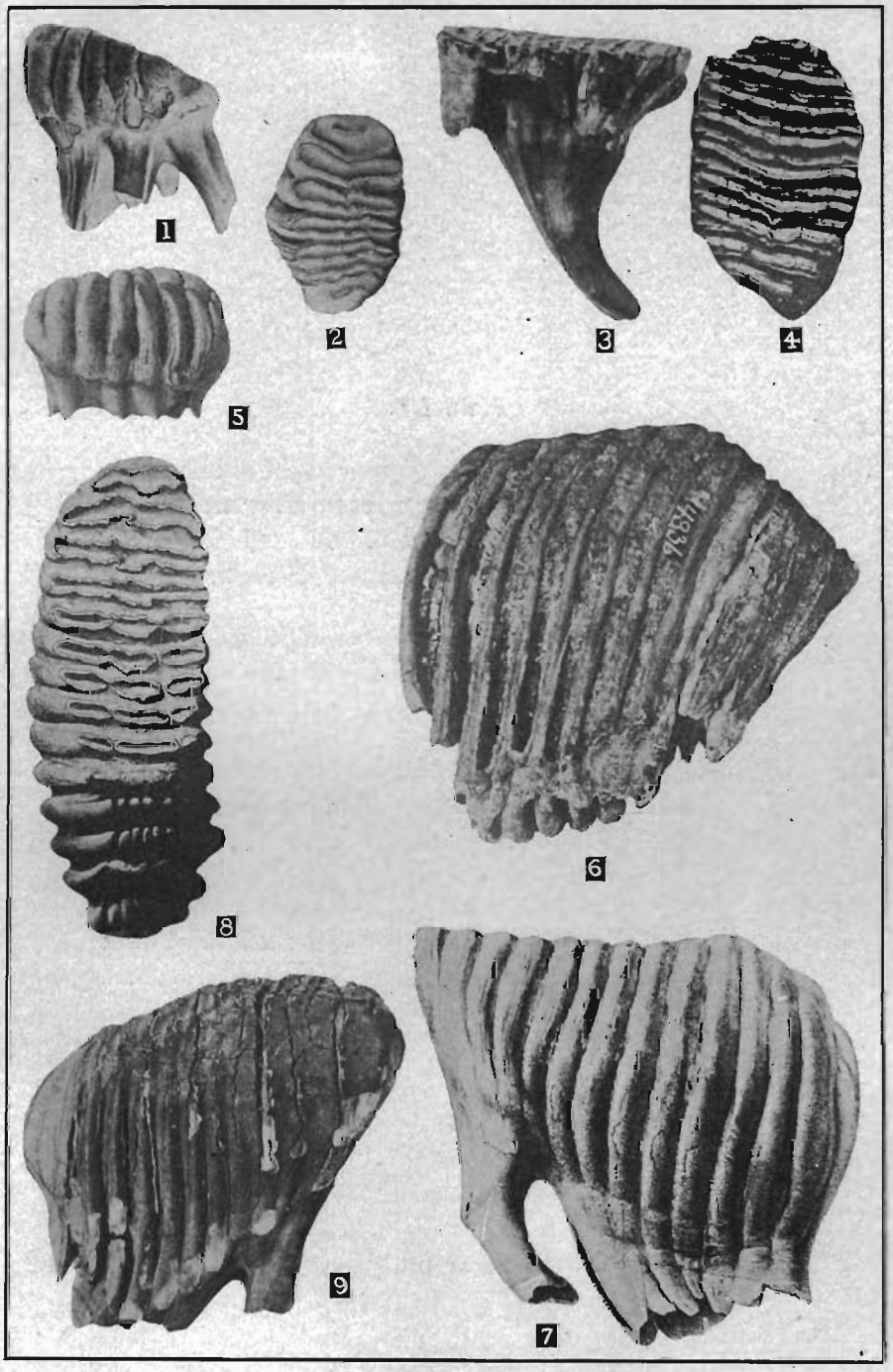
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Plate LV.

Fig. 1. *Elephas primigenius.* Upper right side of jaw, showing a part of the third milk molar and the whole of the first molar. x 1/2. From Alaska. No. 6656, National Museum..pp. 402, 404

Fig. 2. *Elephas primigenius.* Lower right first molar. x 1/2. From Marengo, Iowa. No. 324, State University of Iowa.....pp. 74, 404

Fig. 3. *Elephas primigenius.* Upper left second molar. x 1/2. From Alaska. Hinder plates missing. ..... pp. 404, 407

Fig. 4. *Elephas primigenius.* Upper right second molar. Shows grinding surface. x 1/2. From Alaska. No. 6556, National Museum.....p. 406

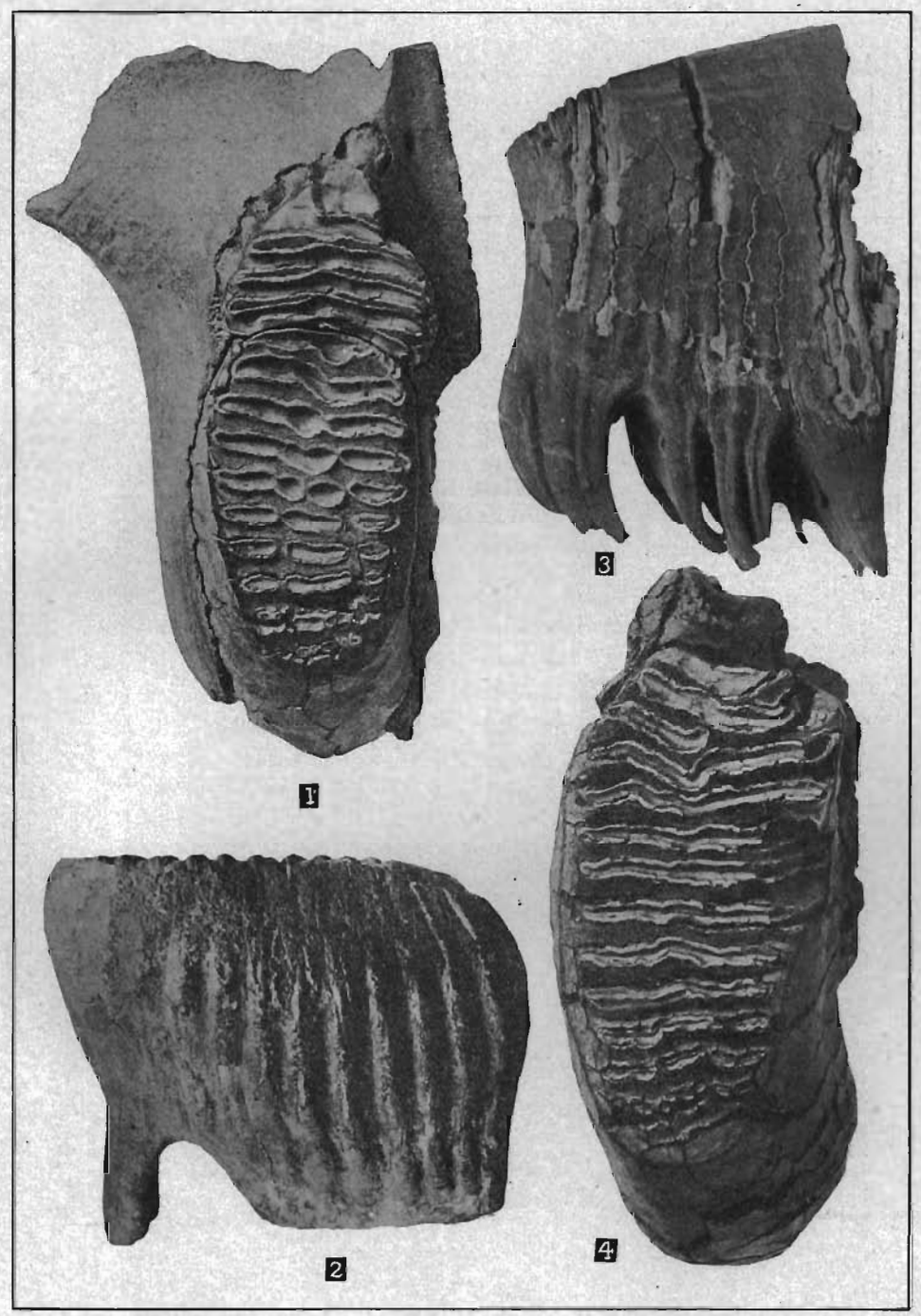
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Plate LVI.

Figs. 1,2. *Elephas primigenius.* Two upper second molars.

1. Upper right second molar, seen from without. Slightly less than one-half natural size. No. 6556, National Museum.....p. 405
2. Upper second molar. x 1/2. No. 21, State University of Iowa.....p. 406

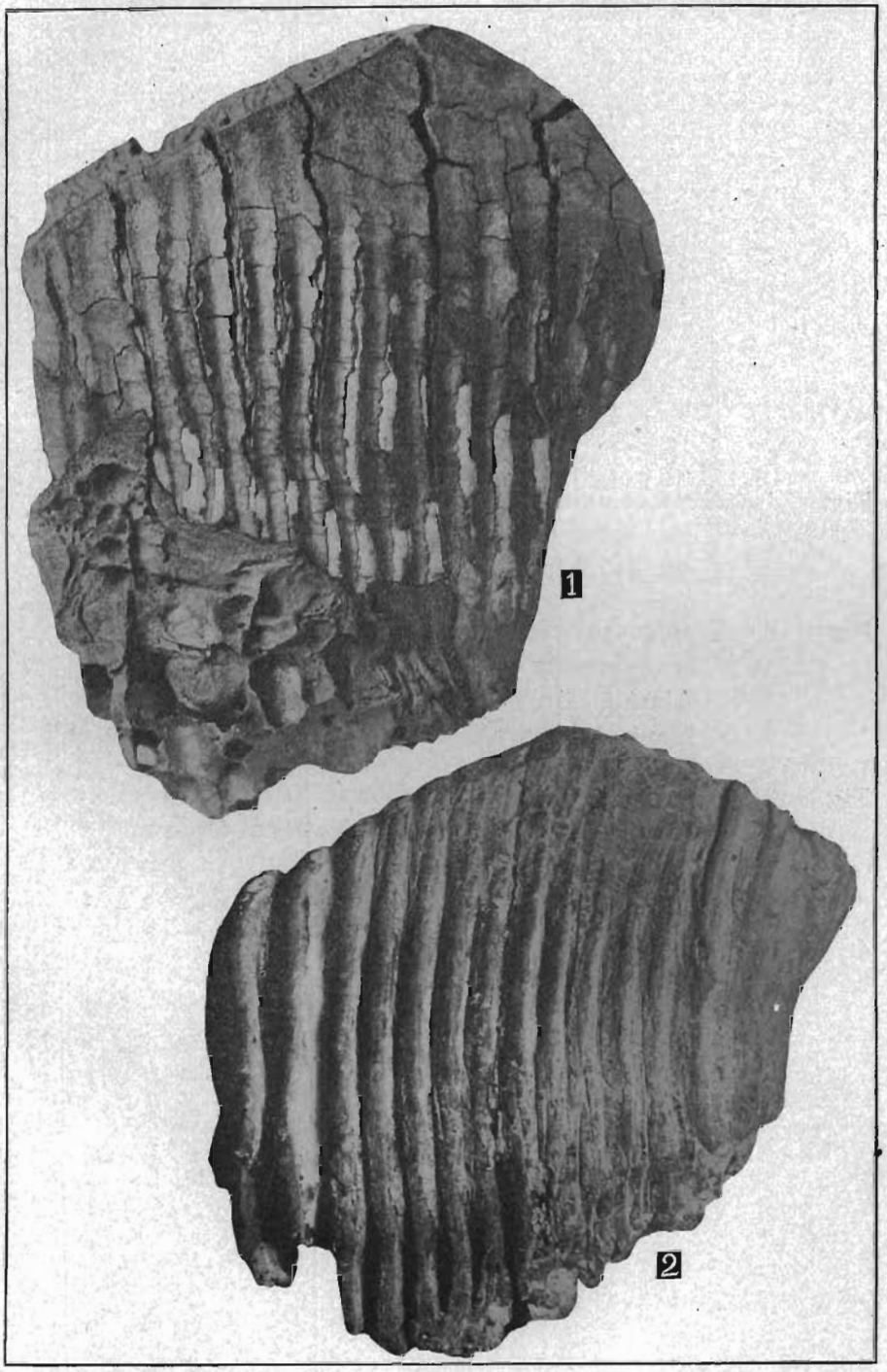
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Plate LVII.

Fig. 1. *Elephas primigenius?* Tusk found in river below Iowa City, now in two pieces. x 1/10. No. 115, State University of Iowa.....pp. 67, 437

Fig. 2. *Elephas primigenius.* Upper right second molar, showing the inner face. x 1/2. From Alaska. No. 6566, National Museum. Some front plates are missing .....p. 406

Fig. 3. *Elephas primigenius.* Lower jaw found in Alaska. x 1/5. No. 6666, National Museum. ..... pp. 399, 407

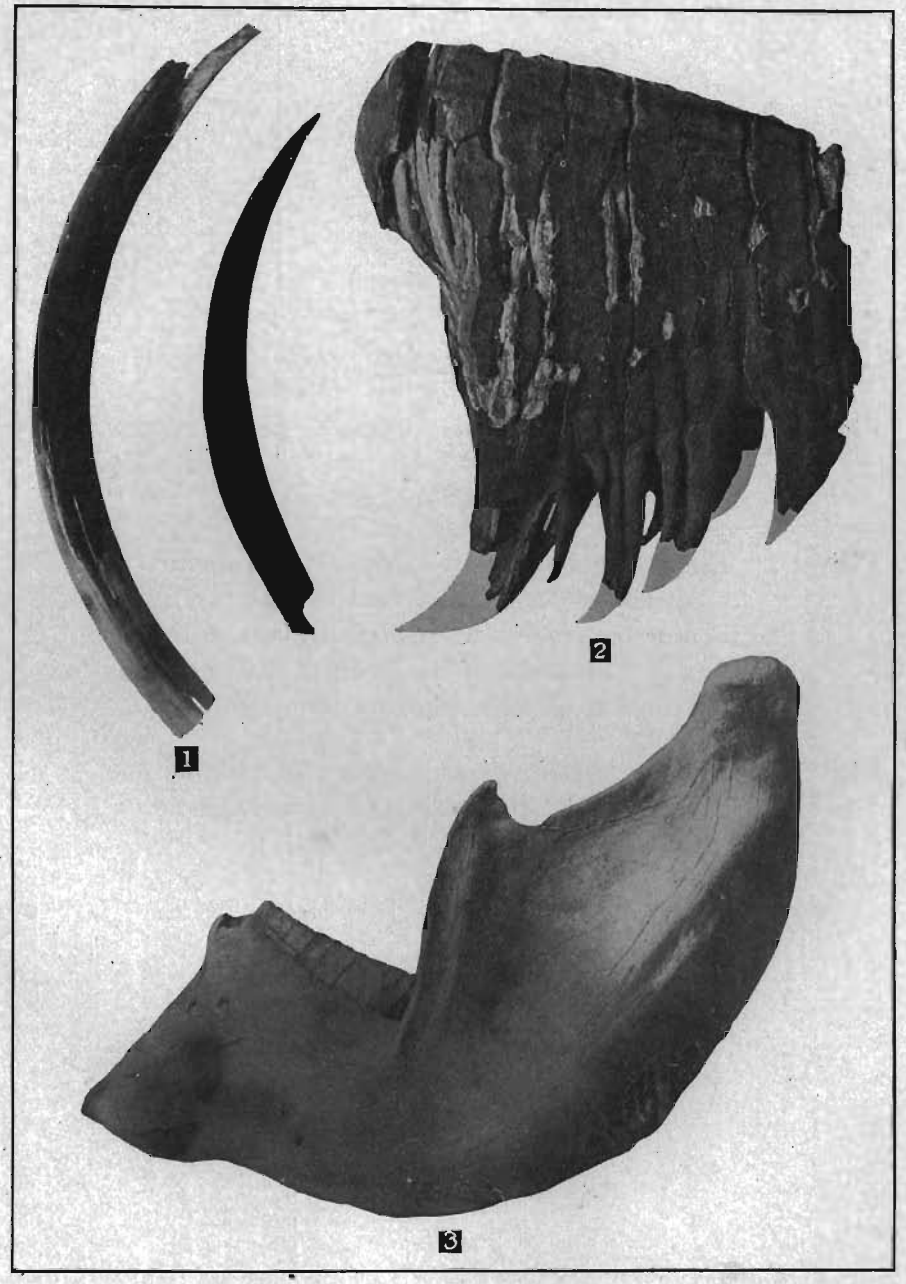
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Plate LVIII.

Fig. 1. *Elephas primigenius.* Upper right third molar. Shows outer face. x 1/2. From Alaska. No. 6564, National Museum.....p. 408

Fig. 2. *Elephas primigenius.* Upper third molars of specimen found in Grant county, Indiana; now in American Museum Natural History. x .8. The rear of the tooth in the figure has been cut off somewhat by the engraver.....p. 408

Fig. 3. *Elephas primigenius.* Lower right second molar. x .44. Found in jaw in western Pennsylvania ..... p. 407

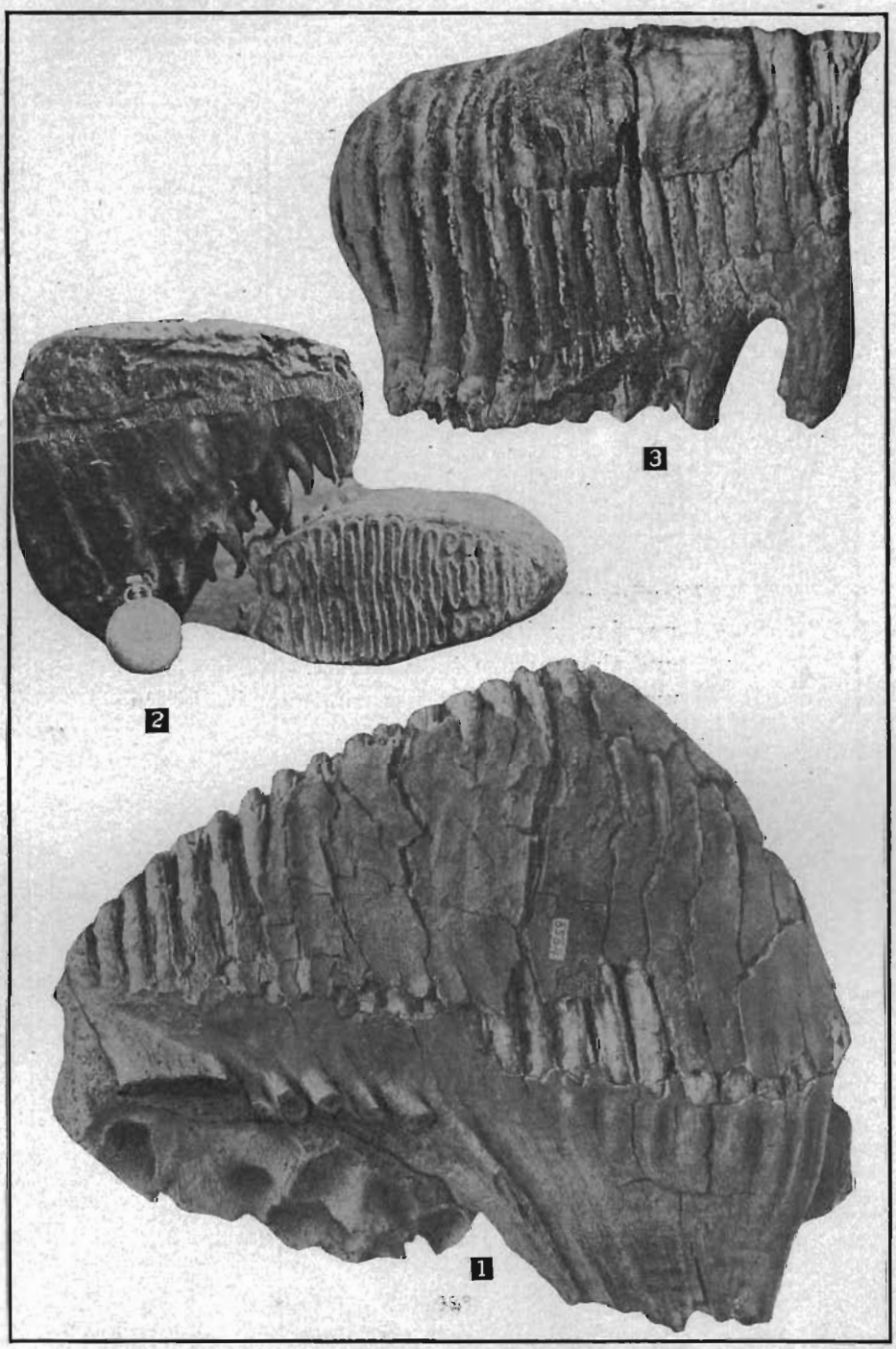
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Plate LIX.

Elephas primigenius. Part of right side of upper jaw, with the much-worn second molar and the unworn third molar. x 1/3. Specimen found in Milwaukee and now in the Public Museum ..... p. 409

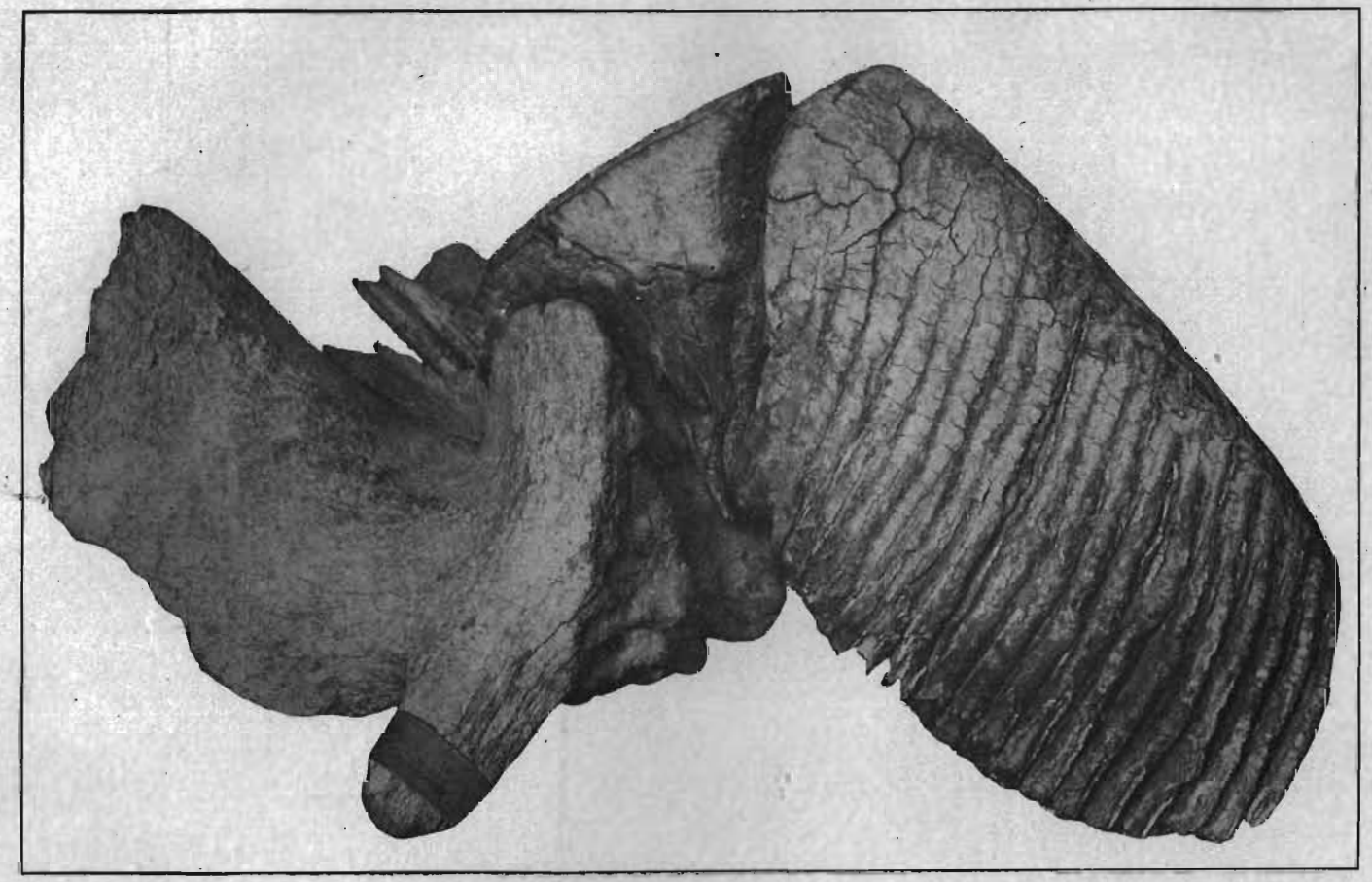

Plate LX.

Elephas primigenius. Restoration based on cadavers found in Siberia. Courtesy of Dr. E. Pfizenmayer, Tiflis, Russia . . . . . p. 409

Plate LXI.

Fig. 1. *Elephas columbi.* Side view of skull in American Museum Natural History. x 1/12. State of Washington ..... pp. 399, 411

Figs. 2,3. *Elephas columbi.* First milk molar. x 1. After Leidy ..... p. 413

2. Side view of tooth.
3. View of grinding surface.

Fig. 4. *Elephas columbi.* Upper left second milk molar. x 1/3. No. 1614, National Museum.....p. 413

Figs. 5,6. *Elephas columbi.* Upper right second milk molar. x 1/3. After Leidy.....p. 413

5. Inner face of the tooth.
6. Grinding face.

Figs. 7,8. *Elephas columbi.*. Lower left second milk molar. x 1/3. No. 6662, National Museum....p. 413

7. View of outer face.
8. View of grinding surface.

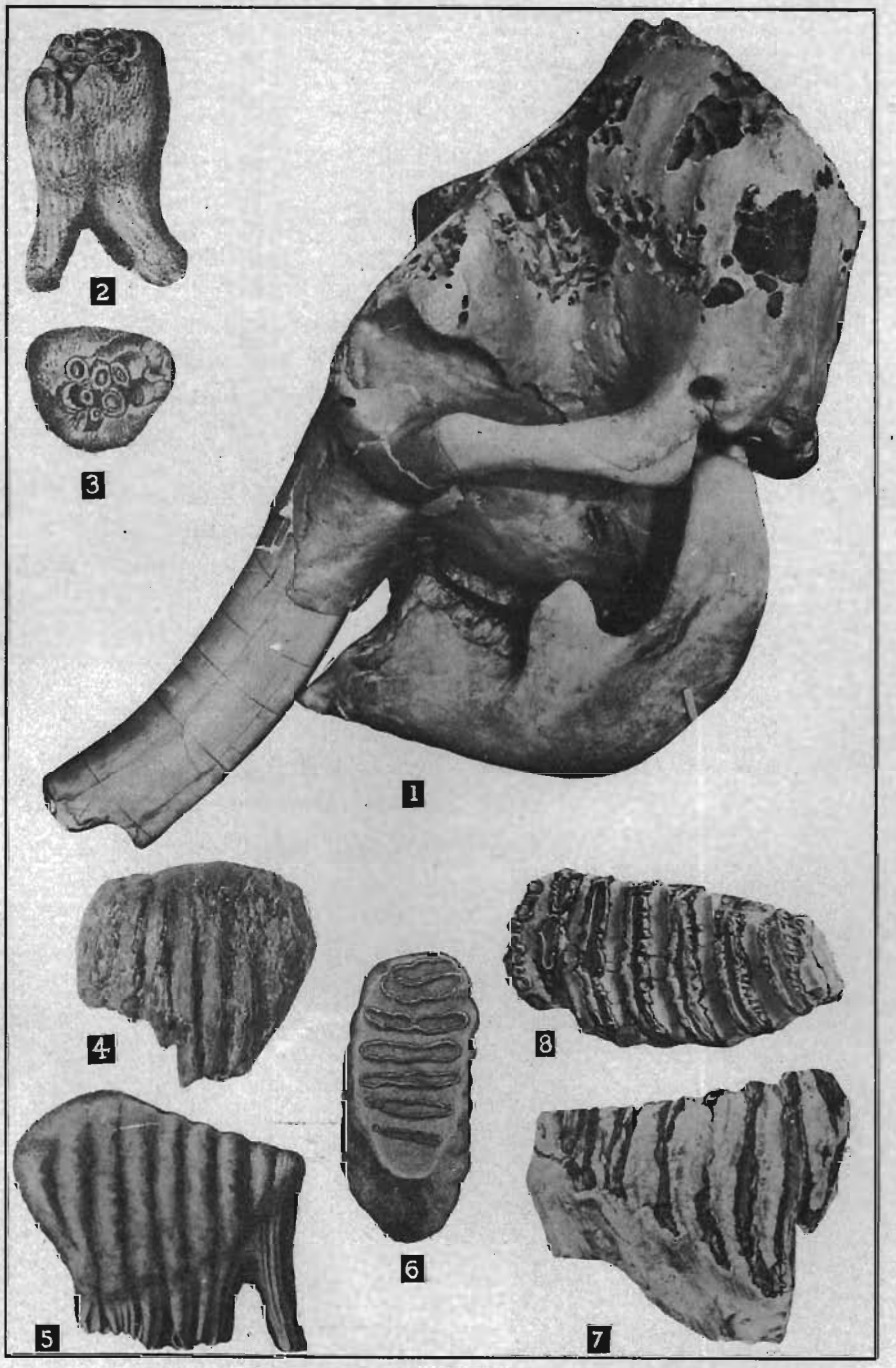
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Plate LXII.

Fig. 1. *Elephas columbi.* Upper third milk molar. x 1/3. From specimen in Philadelphia Academy. Found at Big Bone Lick, Kentucky.. ..... pp. 414, 418

Fig. 2. *Elephas columbi.* Lower third milk molar. x 1/3. Old Crow river, Yukon Territory. No. 6669, National Museum. .....p. 415

Fig. 3. *Elephas columbi.* Lower right milk molar, supposed to be the third. x 1/3. No. 6052, National Museum .....p. 415

Figs. 4,5. *Elephas columbi.* Lower left first molar. x 1/3. No. 2256, National Museum.....p. 416

4. Tooth showing left, or outer, face.
5. View of the grinding face.

Fig. 6. *Elephas columbi.* Lower right second molar. x 1/3. Presents inner face. No. 2554, National Museum .....p. 418

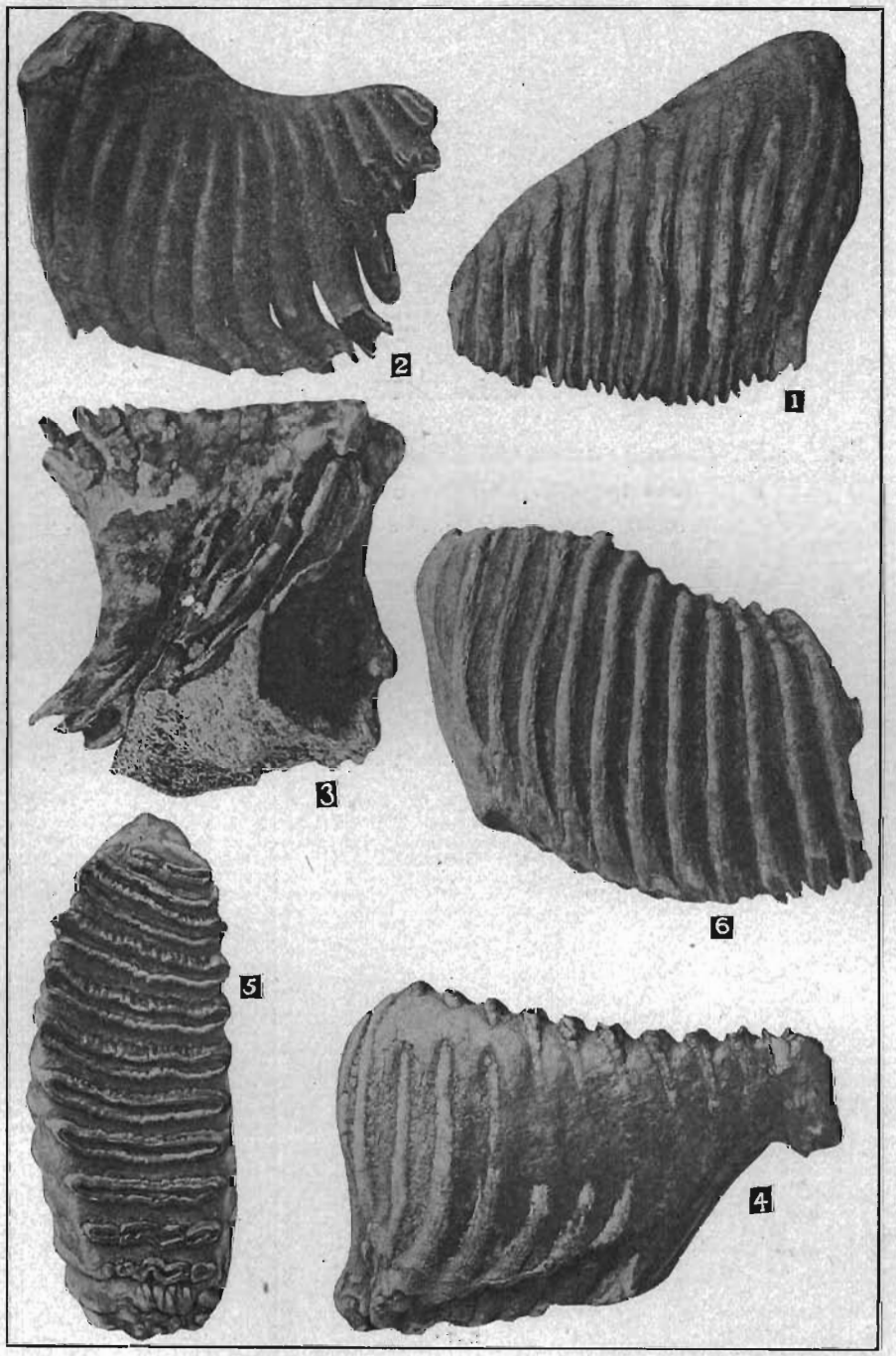
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Plate LXIII.

Fig. 1. *Elephas columbi.* Upper molar, believed to be the second. x 1/3. No. 287, National Museum ..... p. 417

Fig. 2. *Elephas columbi.* Upper second molar. x 1/3. From Logan, Iowa. No. 167, State University of Iowa..... pp. 417, 436

Fig. 3. *Elephas columbi.* Lower right second molar. x 1/3. No. 2254, National Museum..... p. 418

Fig. 4. *Elephas columbi.* Lower left second molar. x 1/3. From Alaska. No. 6668, National Museum ..... p. 418

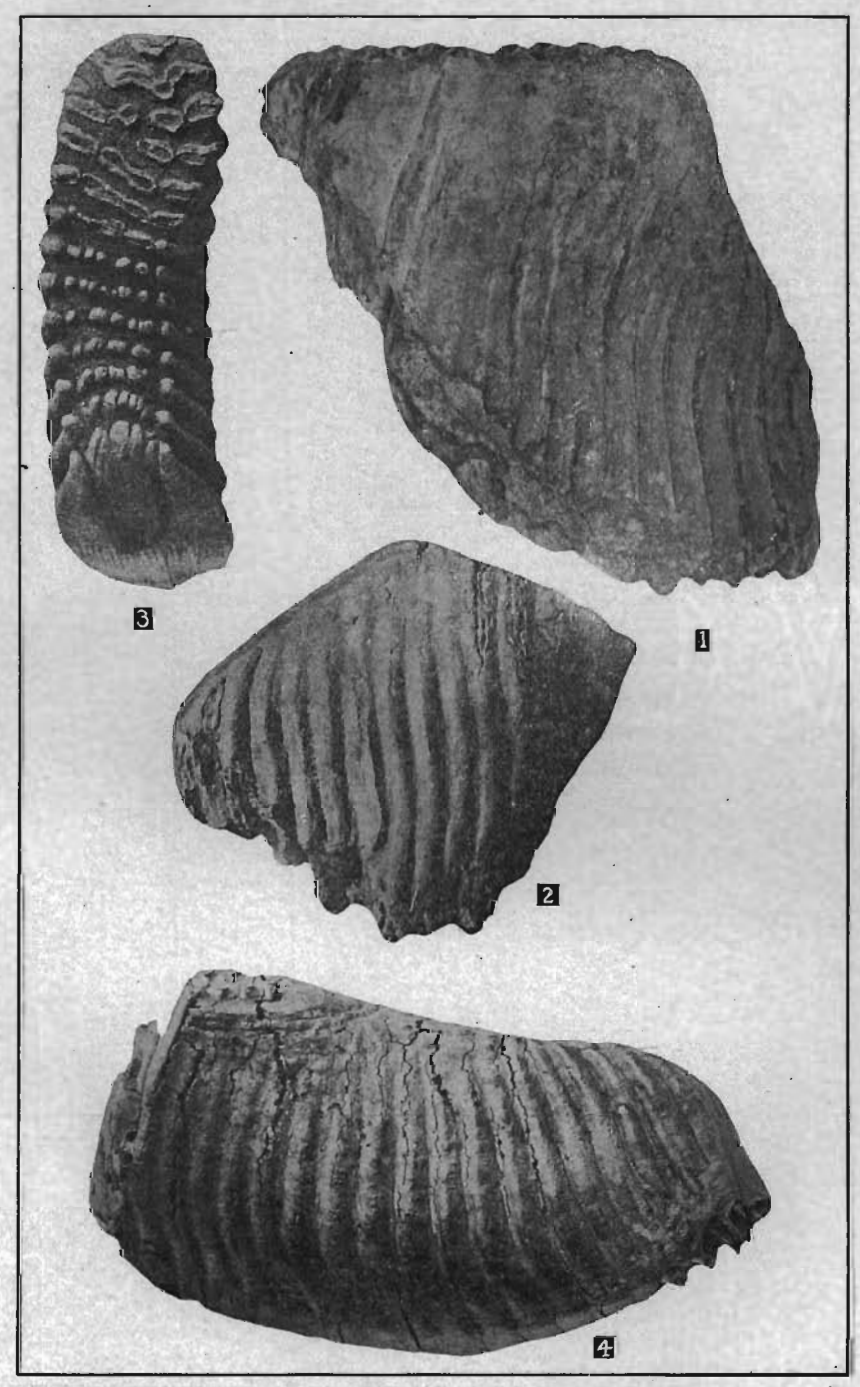
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Plate LXIV.

Fig. 1. *Elephas columbi.* Upper third molar. The base of this tooth is directed upward. x 1/3. No. 2247, National Museum.....p. 419

Fig. 2. *Elephas columbi.* Lower third molar. x 1/3. From specimen found near Mount Angel, Oregon. The grinding surface of this tooth is directed upward .....pp. 419, 421

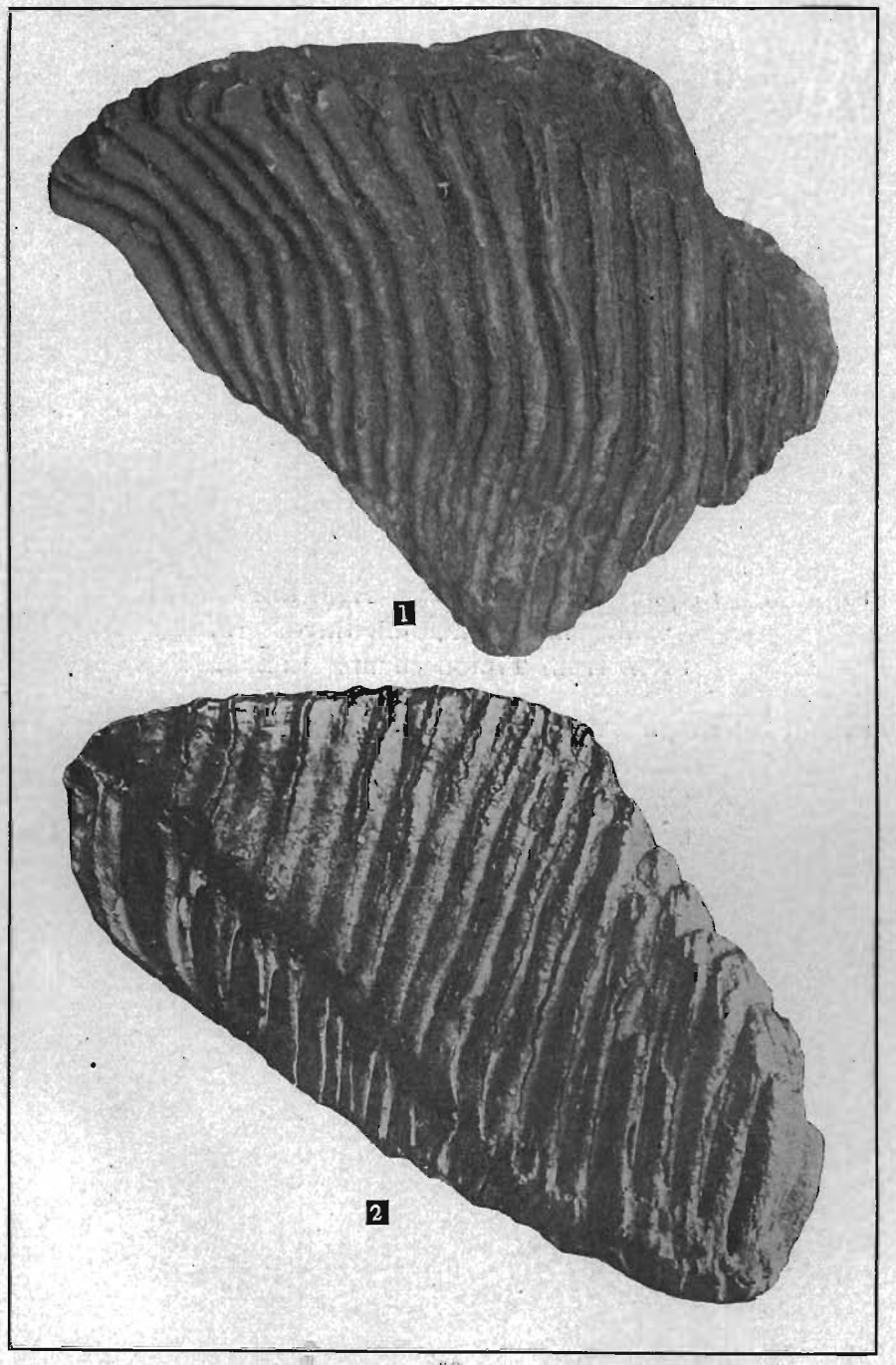
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Plate LXV.

Fig. 1. *Elephas columbi.* Lower right third molar. x slightly more than one-third. Little-worn tooth from Tipton county, Indiana.....p. 420

Fig. 2. *Elephas columbi.* Part of lower jaw with two last molars. Found near Mount Angel, Oregon. From photograph sent by Rev. Ambrose Walsh .....p. 420

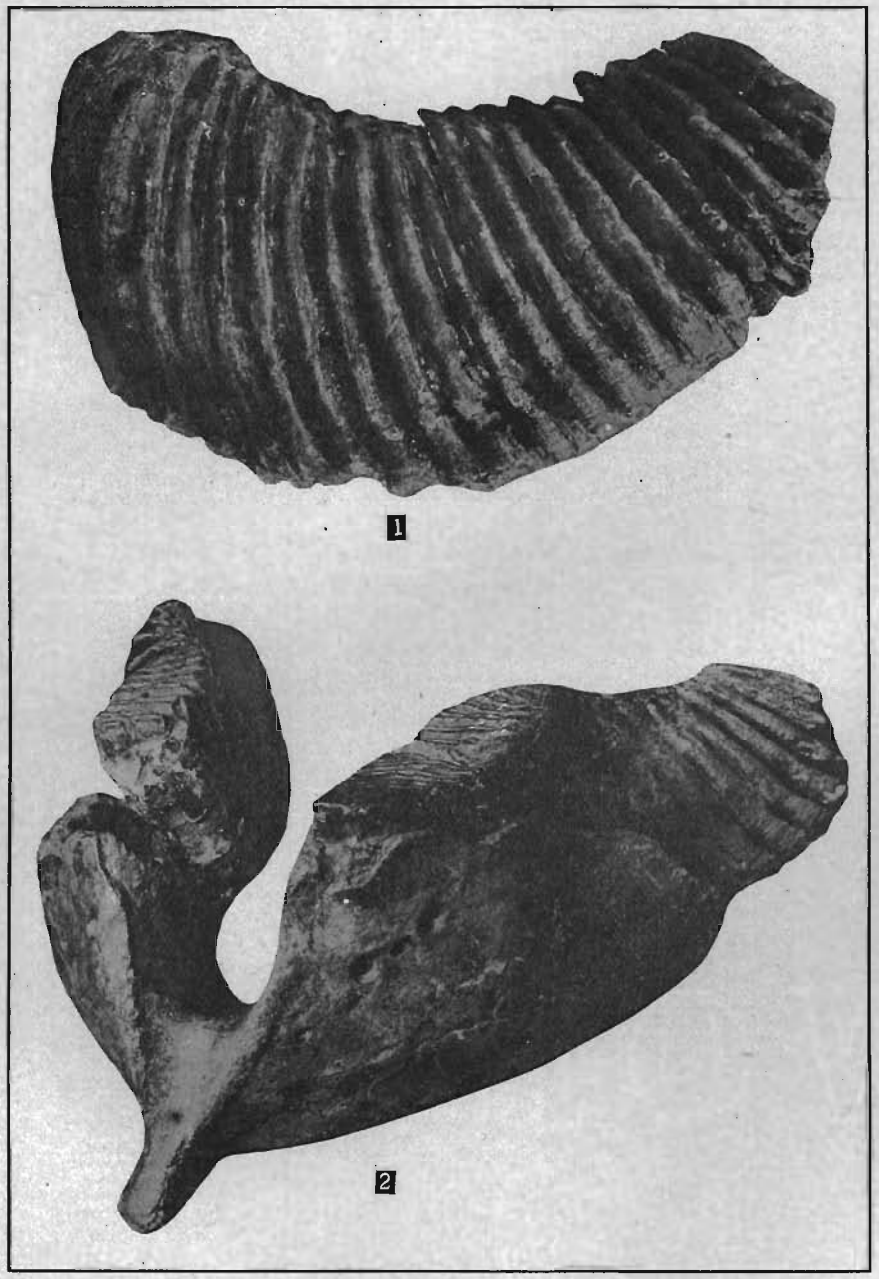
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Plate LXVI.

Fig. 1. *Elephas imperator.* Upper left third molar. x 1/3. No. 2216, National Museum.....p. 422

Fig. 2. *Elephas imperator.* Lower right last molar. x 1/3. Front of tooth toward the left. No. 2217, National Museum .....pp. 422, 423

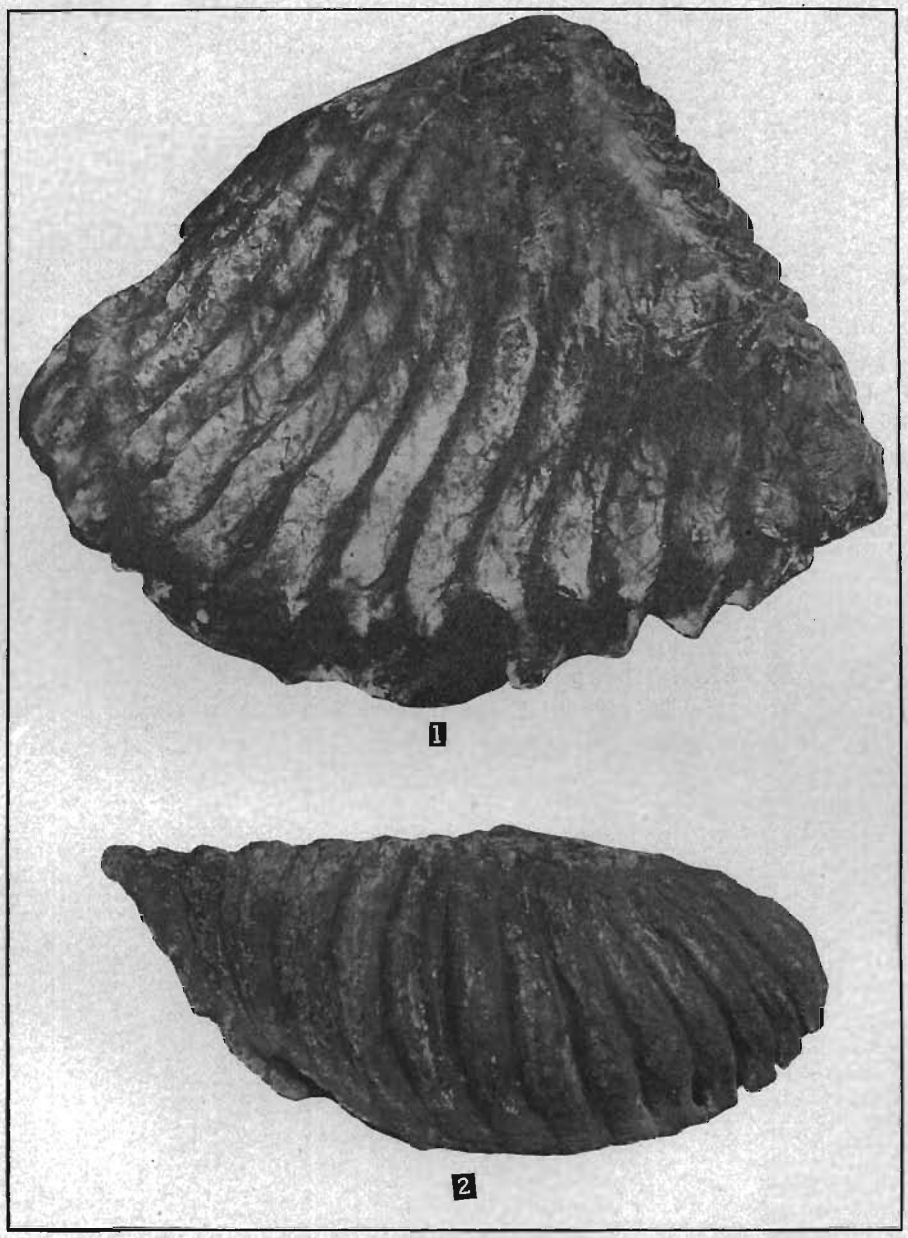
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Plate LXVII.

Fig. 1. *Elephas imperator.* Grinding surface of the tooth shown on plate LXVI, fig. 2. x 1/3. The rear end of this tooth is directed to the right ..... pp. 422, 423

Fig. 2. *Elephas imperator.* Upper right third molar. x .44. From Pisgah, Harrison county, Iowa. State University of Iowa ..... pp. 426, 436

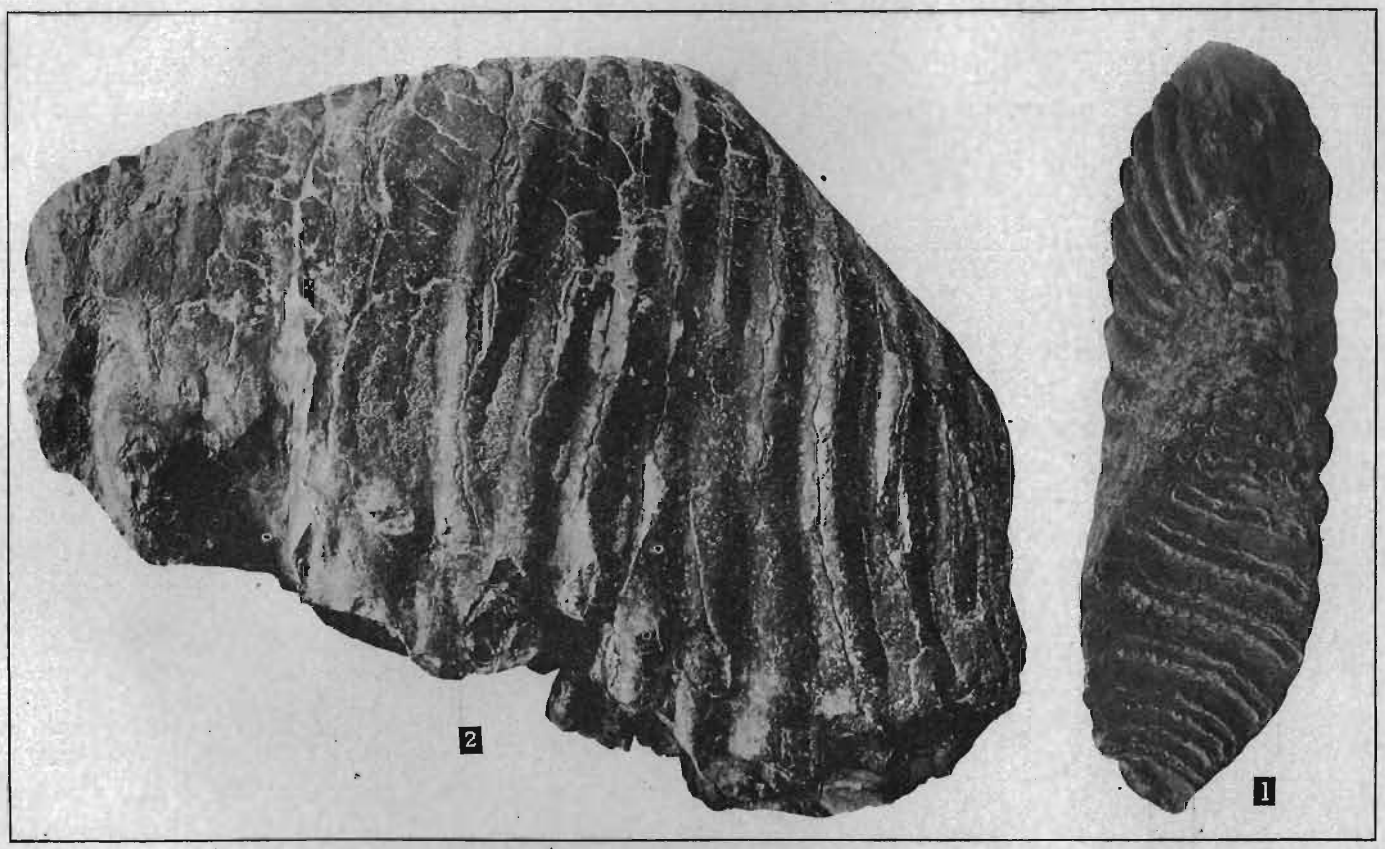
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Plate LXVIII.

Map showing localities in Iowa where remains of elephants have been found.....p. 427

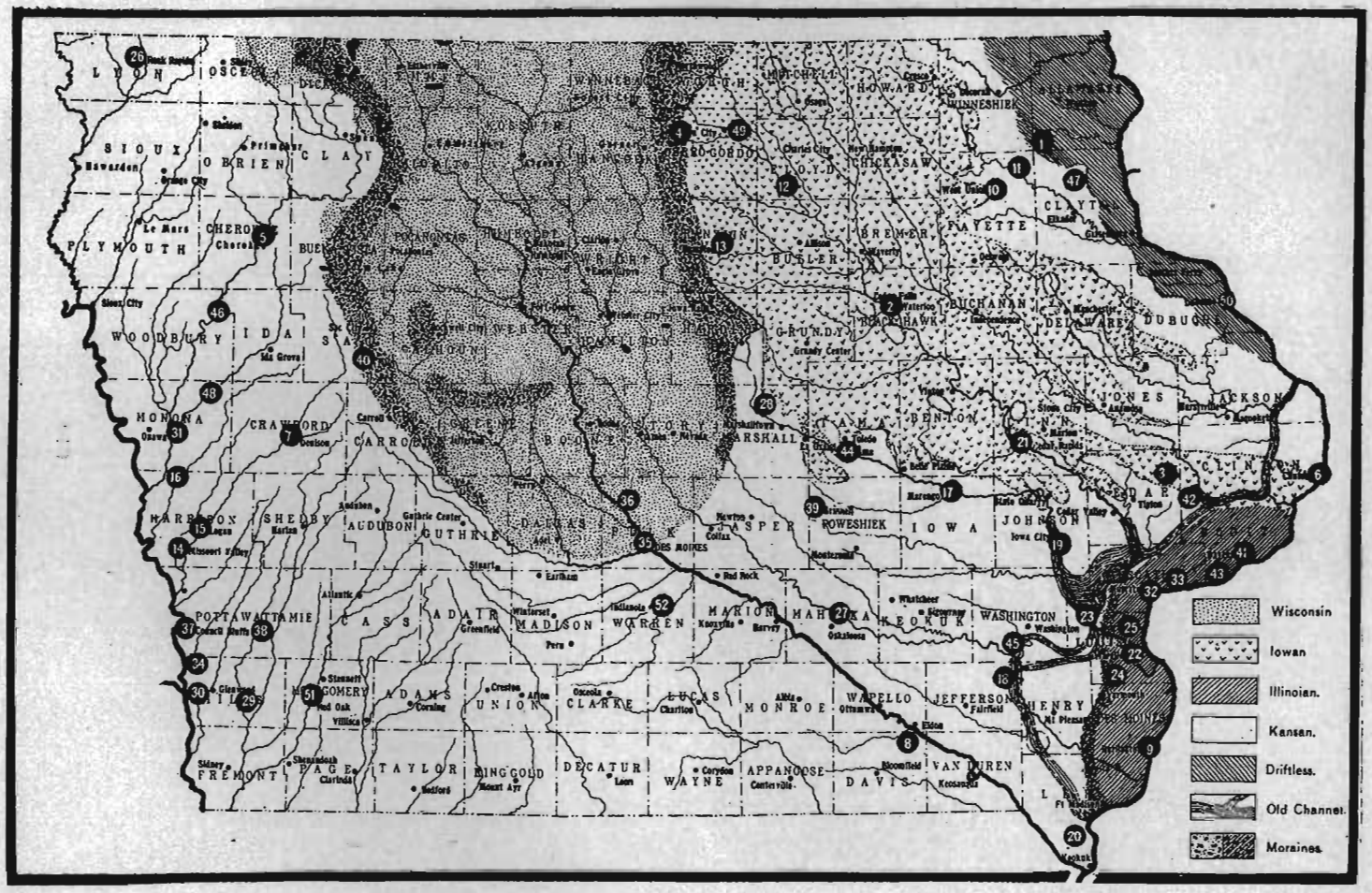
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Plate LXIX.

Fig. 1. *Elephas primigenius.* Part of upper jaw, with the right last molar. x about 1/10. No. 294, State University of Iowa.....p. 431

Fig. 2. *Elephas primigenius.* Upper right third molar. x .28. Marble Rock, Iowa.....p. 434

Fig. 3. *Elephas primigenius.* Atlas seen from front. x 1/6. No. 314, State University of Iowa... ..... pp. 77, 439

Figs. 4,5. *Elephas primigenius?* Right innominate bone found near Oskaloosa, Iowa. x .15....pp. 79, 440

4. Seen from front and somewhat below.
5. Seen from below.
   a. Outer angle of ilium.
   b. Angle which articulates with the sacrum.
   c. Crest of the ilium.
   e. Anterior border of the pubis.
   f. Ischio-pubic symphysis.
   g,g. Ischium.
   h. Ischio-pubic foramen.
   i. Acetabulum.

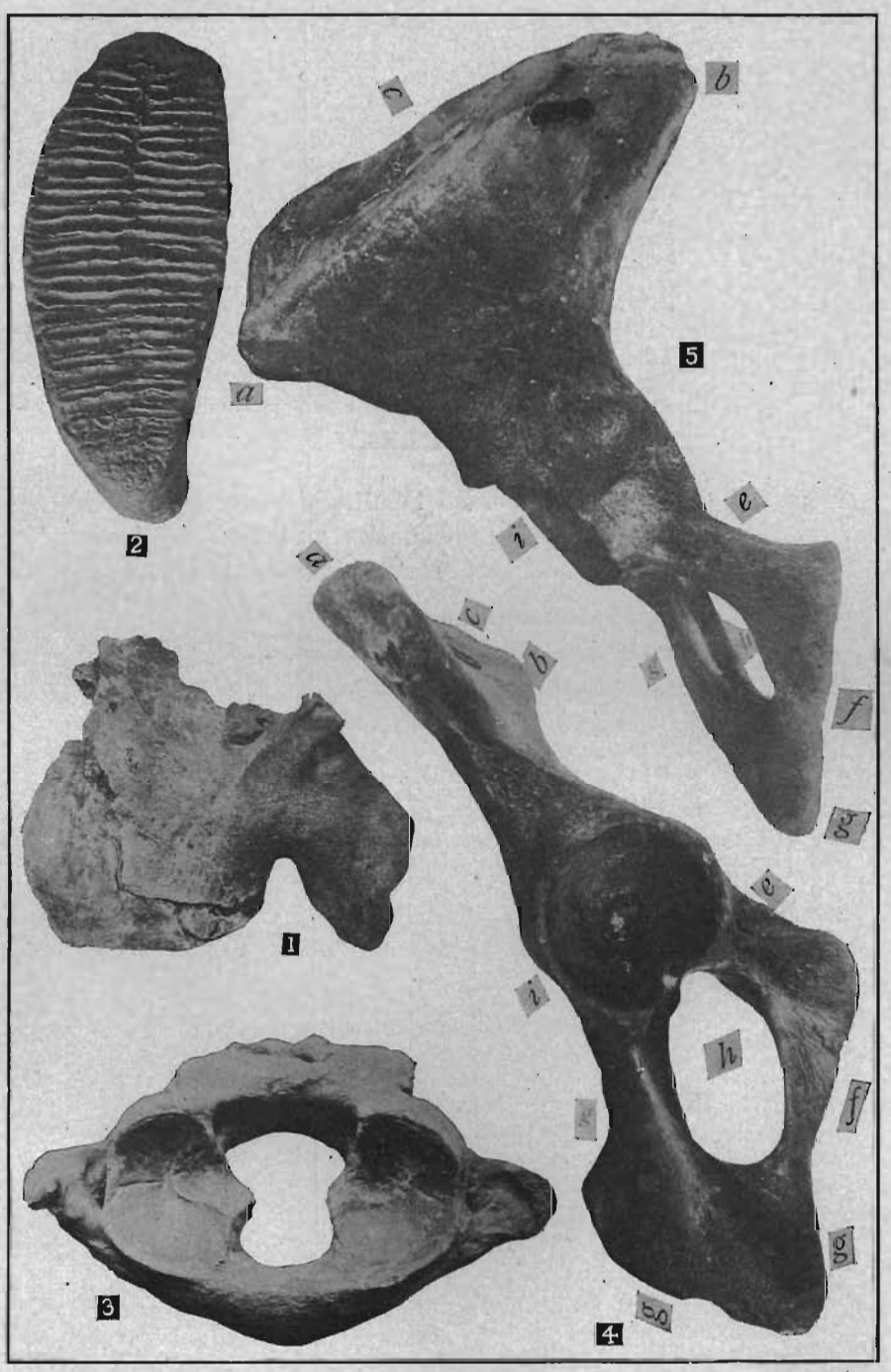
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Plate LXX.

Figs. 1-4. *Castor canadensis.* Skull and lower jaw taken from a recent specimen. x about 2/5. After Baird ..... p. 452

1. Skull seen from the side.
2. Lower jaw seen from the side.
3. Skull showing palatal view.
4. Lower jaw seen from above.

Fig. 5. *Castor canadensis.* Part of lower jaw and three teeth. x 1. Pleistocene. No. 349, State University of Iowa..... p. 454

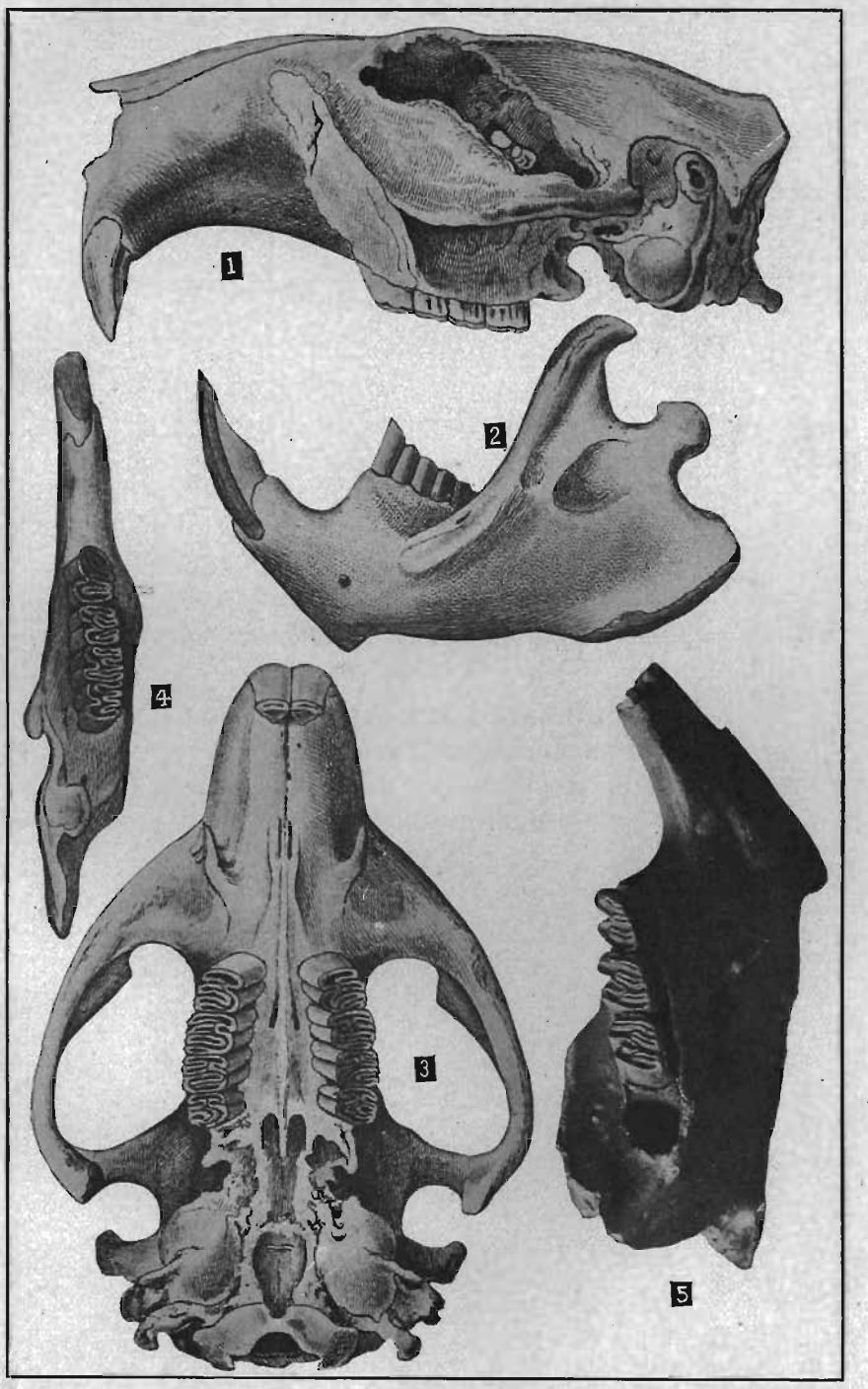
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Plate LXXI.

Figs. 1, 2. *Castoroides ohioensis.* Skull and lower jaw. No. 1634, National Museum.

1. Skull presenting a view of the palate. x .36. From Logansport, Indiana.....p. 463
2. Lower jaw of the mounted specimen at Earlham College. Seen from above. x 2/5.....p. 466

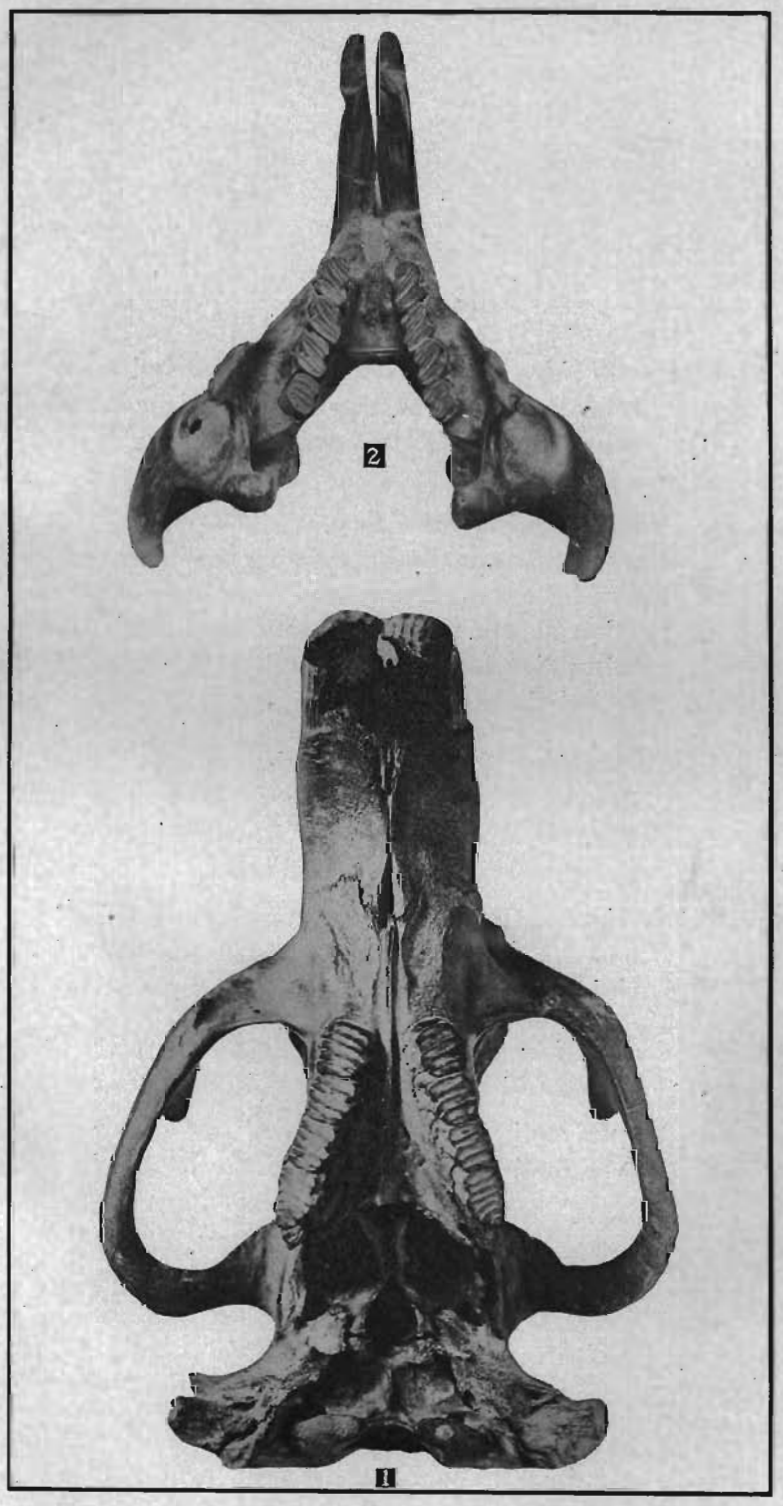
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Plate LXXII.

Figs. 1-4. *Castoroides ohioensis.* Three views and a section of part of an upper left incisor found near Oakland, Pottawattamie county, Iowa. x 1 ..... p. 467

1. Tooth showing outer face.
2. Part of the same tooth, showing the inner face.
3. Part of the same tooth, seen from in front.
4. Section across the same tooth, the inner face being directed towards the left, the front directed above. x 1 ..... p. 467

Fig. 5. *Castoroides ohioensis.* Section of left upper incisor of specimen in American Museum of Natural History. Placed as in Fig. 4. x 1. From Berrien county, Michigan ..... p. 467

Fig. 6. Section of left lower incisor of same specimen. The left, or outer, face is toward the right. x 1 ..... p. 467

Figs. 7,8. *Castoroides ohioensis.* Grinding surfaces of upper and lower teeth. x 1. From Moore.

7. Upper teeth ..... p. 459
8. Lower teeth ..... p. 460

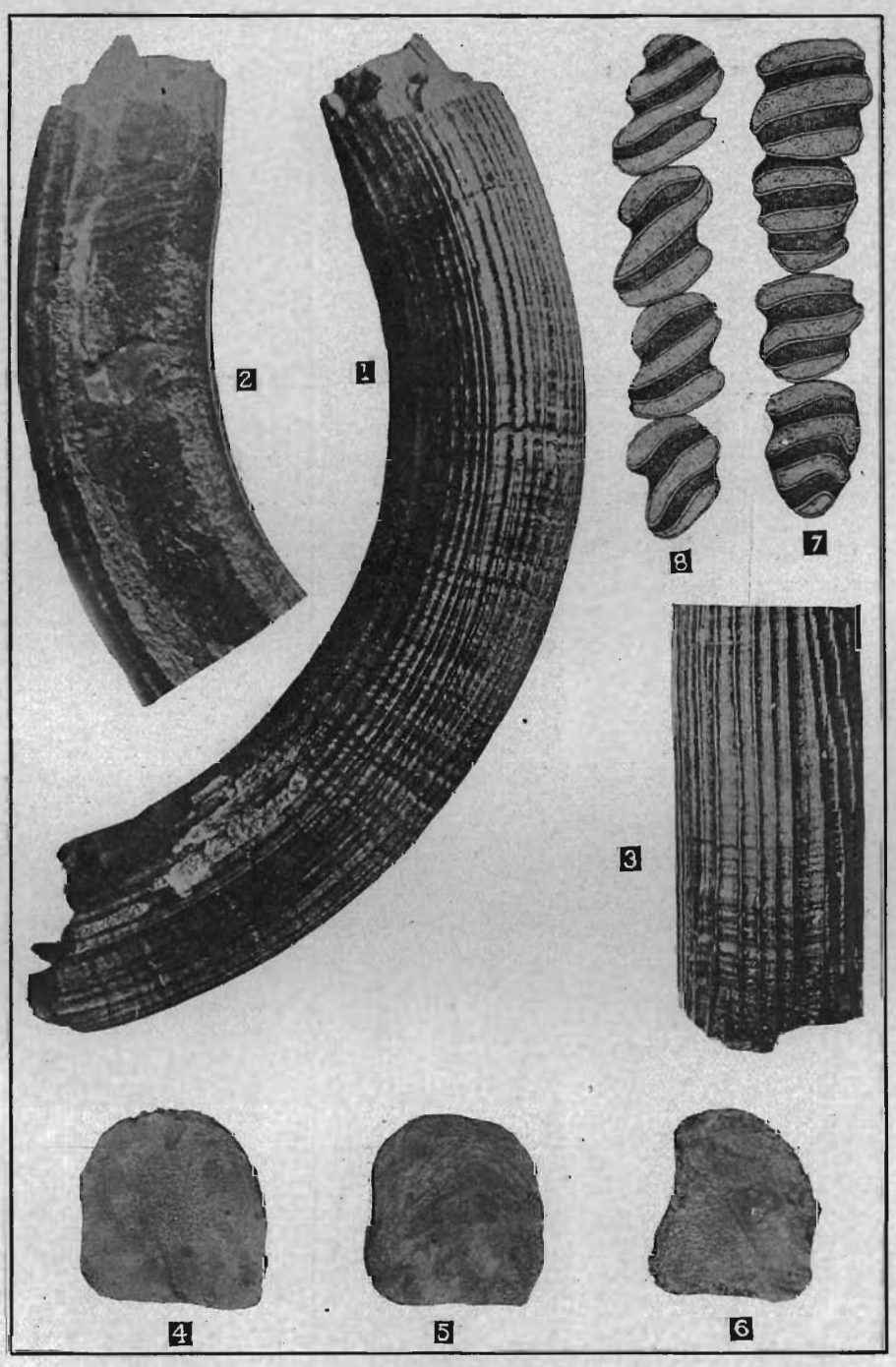
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Plate LXXIII.

Figs. 1-4. *Sylvilagus floridanus.* Views of the skull and lower jaw. x 1. No. 189514, National Museum ..... pp. 470, 472

1. Skull seen from above.
2. Skull and lower jaw seen from the side.
3. Skull showing palatal view.
4. Lower jaw seen from above.

Figs. 5,6. *Sylvilagus floridanus.* Views of the grinding surfaces of the upper and the lower teeth of the right side. x 2. From Lyon.....pp. 470, 472

5. Upper teeth.
6. Lower teeth.

Fig. 7. *Ursus americanus.* Lower jaw. x 3/5.....p. 476

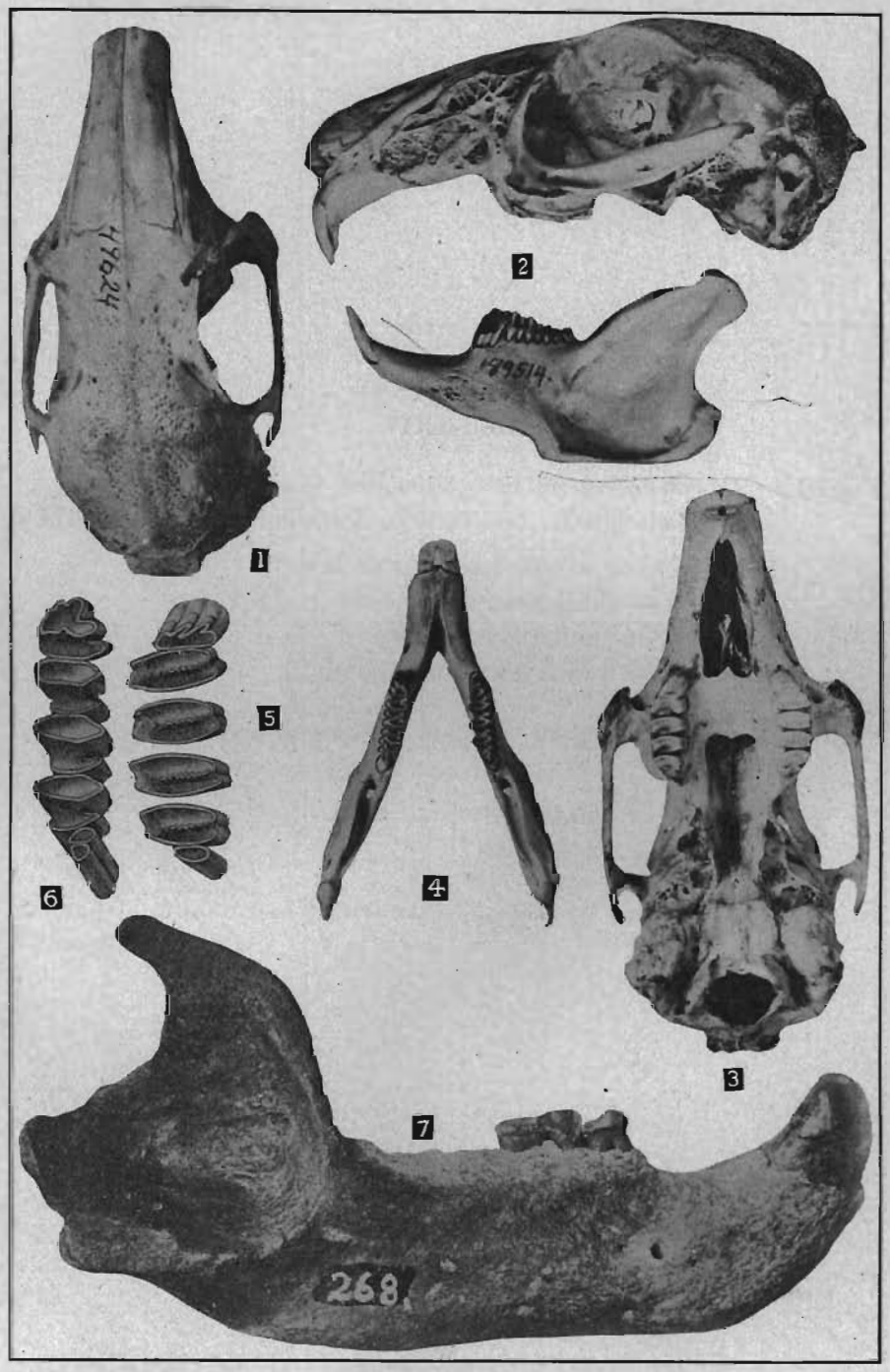
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Plate LXXIV.

Figs. 1-4. *Mephitis mephitis.* Views of skull and lower jaw. x 3/4. No. 110191, National Museum. . p. 481

1. Side view of skull and lower jaw.
2. View of skull from above.
3. View of skull from below.
4. View of lower jaw from above.

Figs. 5,6. Views of upper and lower jaws to show teeth. x 1.4 . . . . . p. 481

5. View of palate and upper teeth.
6. View of lower teeth.

Fig. 7. *Camelops kansanus.* Lower left last molar. x 1. . . . . pp. 239, 243

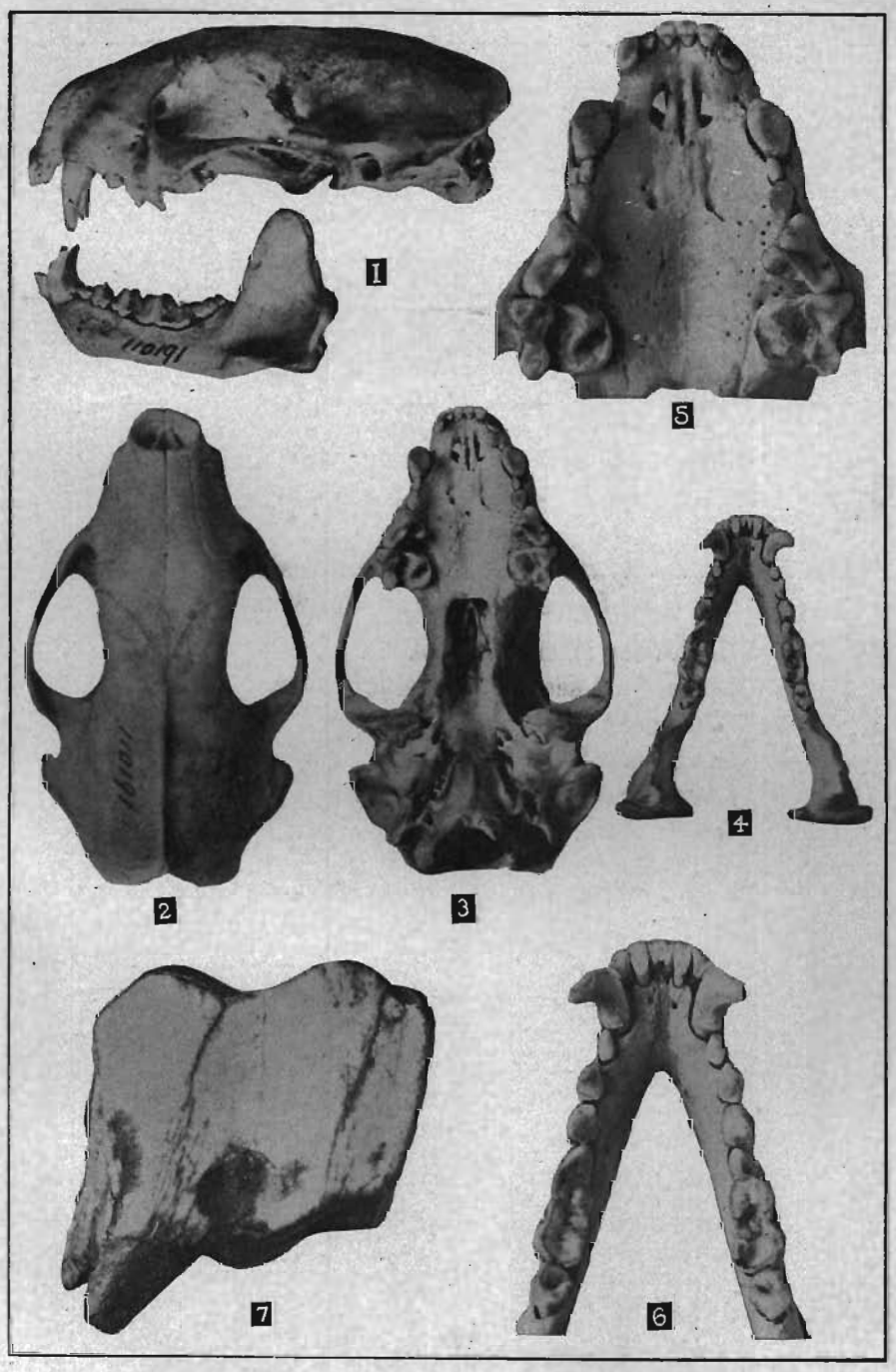
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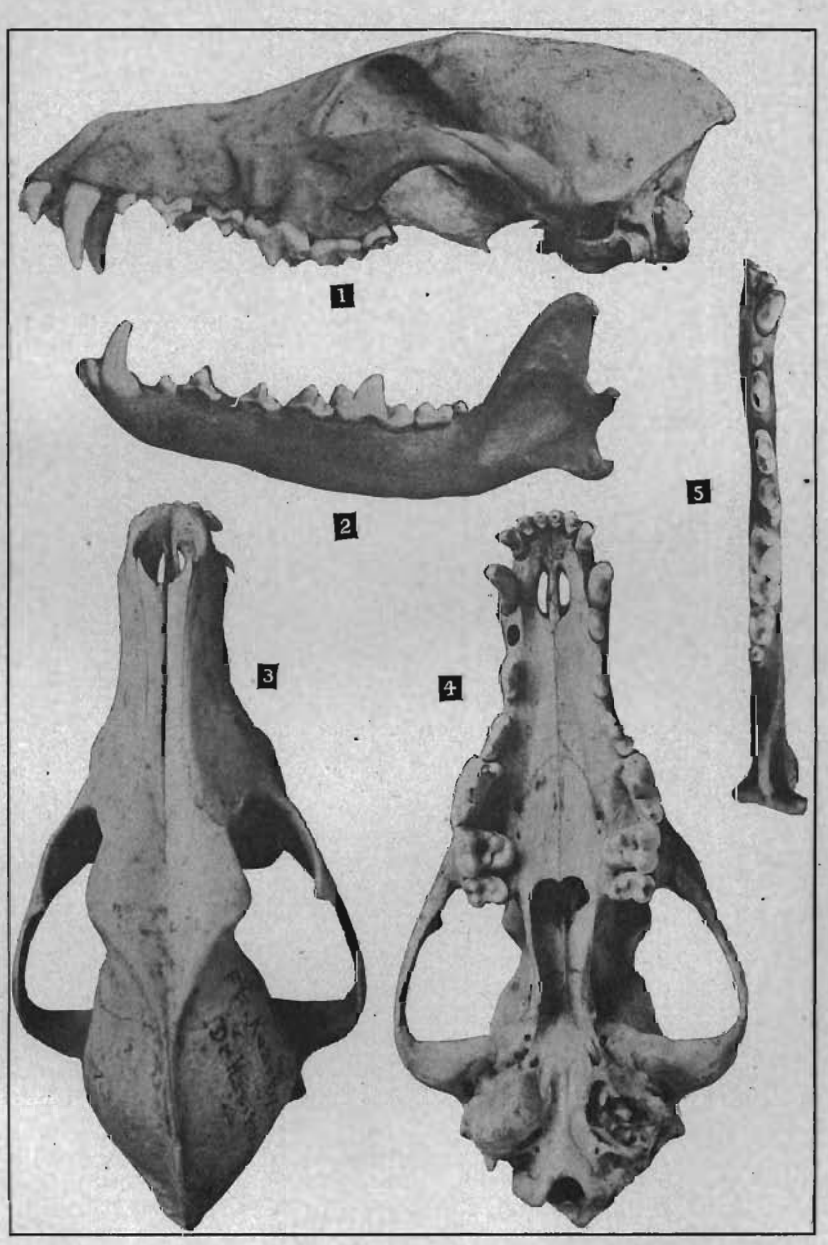
Plate LXXV.

Figs. 1-5. *Canis latrans.* Views of skull and lower jaw. x 1/2. Specimen in National Museum.....p. 491

1. Skull seen from left side.
2. Lower jaw seen from the left side.
3. Skull seen from above.
4. Skull seen from below.
5. Lower jaw seen from above.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