

**A PECCARY, *PLATYGONUS COMPRESSUS* LeCONTE,
FROM DRIFT OF WISCONSINAN AGE
IN NORTHERN PENNSYLVANIA†**

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ABSTRACT. A skeleton of the peccary, *Platygonus compressus* LeConte, was recovered from a borrow pit at Mosherville, Bradford County, northern Pennsylvania. The specimen was preserved in a well-bedded coarse sand, part of a kame of Olean Drift (of MacClintock and Apfel, 1944) of Wisconsinan Age. A radiocarbon date of $11,900 \pm 750$ B.P. on rib fragments from the skeleton should be used with caution as a probable minimum date. This occurrence suggests that *P. compressus*, far from serving as an interglacial or southerly faunal indicator, may have ranged to within a few miles of the edge of the Wisconsinan ice sheet.

INTRODUCTION

In September, 1965, Merton Harkness of Gillett, Pennsylvania, discovered and collected the major part of a skeleton of the extinct peccary, *Platygonus compressus*, during excavations in a borrow pit near Mosherville, Bradford County, Pennsylvania (fig. 1, map A). The pit is on the property of Mildred and Florence Terwilliger at $41^{\circ} 58' 20''$ N, $76^{\circ} 54' 40''$ W, in the Millerton, Pennsylvania, 7.5-minute quadrangle, U. S. Geological Survey. It is a few hundred yards southwest of Mosherville, at an elevation between 1200 and 1300 feet, in a conical hill about 1000 feet in diameter that rises about 140 feet above Seeley Creek on its east side (fig. 1, map B; pl. 1-A).

Mr. Harkness and his son, Jay, then a student at Troy Community Junior High School, Troy, Pennsylvania, presented the skeleton to the science department of the school. Ralph Carls, then a science teacher in the department, brought the specimen to the U. S. National Museum. Through the agency of Mr. Carls, and of Walter Corbett and Harry A. Crumbling, both of the Troy area school system, the specimen was subsequently presented to the National Museum, where it has been catalogued in the Division of Vertebrate Paleontology under the number U.S.N.M. 23706. At the request of one of us (Ray), Mr. Carls and Mr. Harkness revisited the site in October 1965, to secure field photographs showing the exact position of the specimen in the pit. These photographs enabled Denny to relocate the spot and to determine that the wall of the pit was much the same at the time of his visit on September 20, 1966, as it had been a year earlier.

The peccary skeleton was found some 12 feet below ground level. The material surrounding the skeleton was undisturbed; therefore, the emplacement of a younger fossil in an older deposit is not indicated. Secondary deposition of a whole skeleton is out of the question. Long distance transport of the specimen as a freshly dead carcass is improbable,

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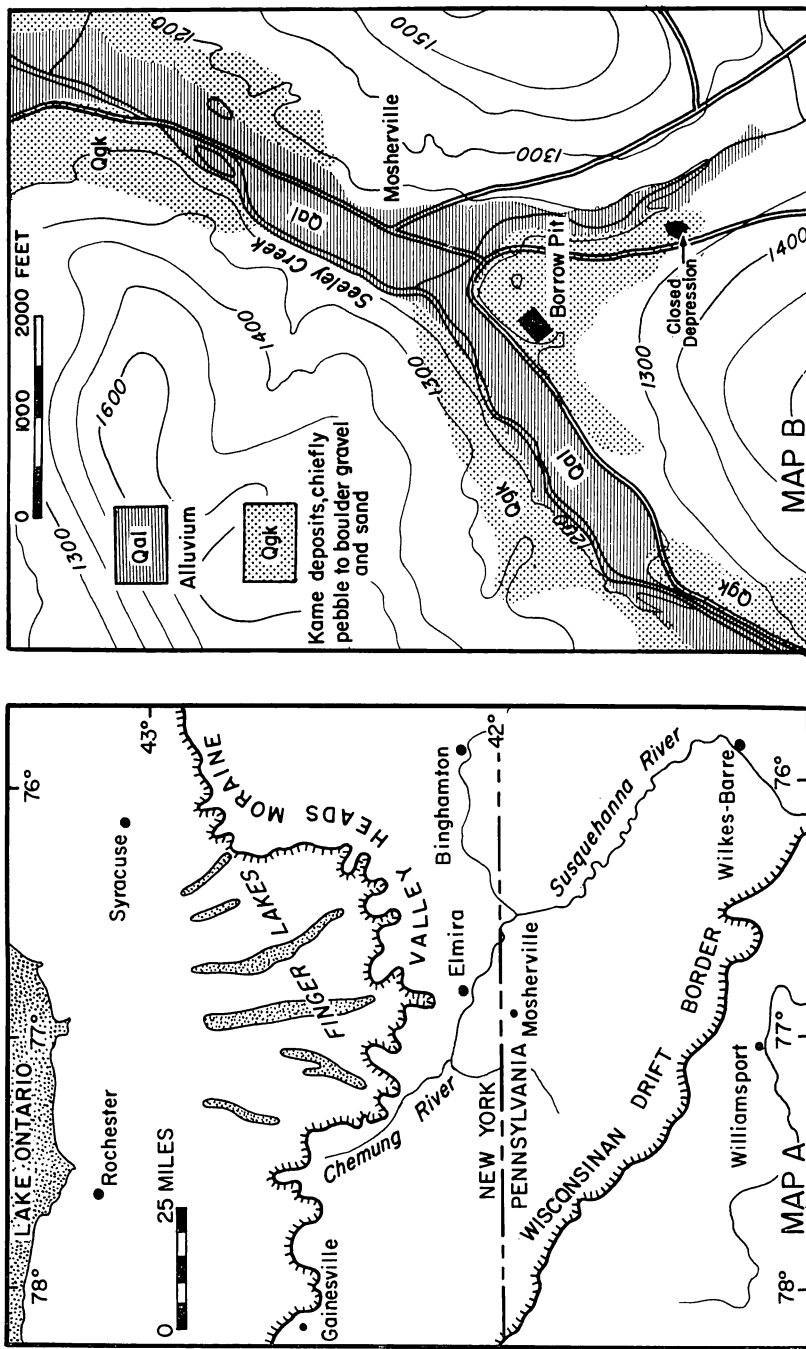


Fig. 1. Location maps. A, the fossil locality at Mosherville in relation to the Wisconsin drift border and the Valley Heads moraine (Denny and Lyford, 1963, pl. 3). B, the borrow pit in which the fossil occurred and its immediate vicinity, contour interval 100 feet; generalized from Milleron, Pa. 7.5 minute quadrangle, U. S. Geological Survey. Glacial deposits from Denny and Lyford (1963, pl. 1).

and, in this case, the body would have been carried away from the glacial margin. Thus, the most conservative hypothesis is that the animal died in the immediate vicinity of the place at which its remains were discovered and at the time when the sands enclosing it were deposited.

The purpose of this paper is to report on the specimen, the geology of its occurrence, and its age, and to discuss its probable paleoecological significance.

ACKNOWLEDGMENTS

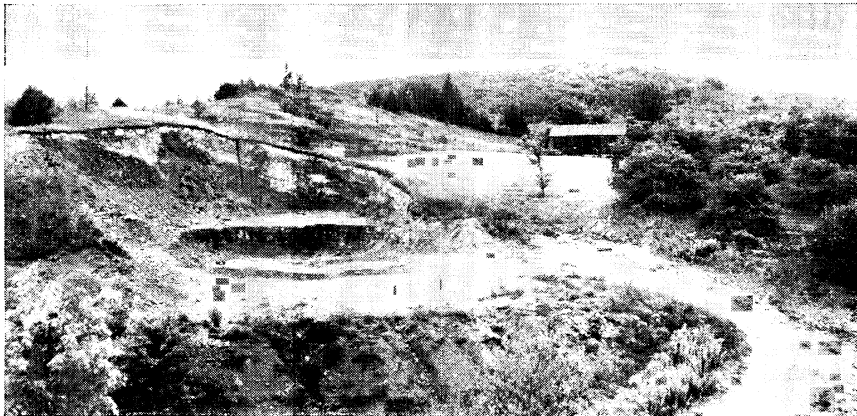
We wish to thank Merton and Jay Harkness, Mildred and Florence Terwilliger, Ralph Carls, Walter Corbett, and Harry A. Crumbling for the essential part played by each in salvaging the skeleton and for essential data regarding it. The skeleton has been prepared and restored by Leroy Glenn, Jr., and Gladwyn B. Sullivan, Division of Vertebrate Paleontology, U. S. National Museum, and skillfully mounted by Mr. Sullivan for exhibition in a rooting stance (pl. 1-B). The illustrations were prepared by Lawrence B. Isham, Scientific Illustrator for the Department of Paleobiology, U. S. National Museum. Dr. Paul S. Martin, University of Arizona, examined for pollen and found to be sterile several samples of matrix collected by Denny adjacent to the place of discovery of the fossil. This manuscript has been critically reviewed by Mr. John E. Guilday, Carnegie Museum, Mr. Bob H. Slaughter, Southern Methodist University, and Dr. Frank C. Whitmore, Jr., U. S. Geological Survey. Guilday also loaned comparative material useful in reconstructing missing parts of the skeleton. Dr. David H. Dunkle provided measurements of specimens in the Cleveland Natural Science Museum, and Dr. Donald W. Fisher provided measurements of a specimen in the New York State Museum. Members of the Department of Vertebrate Paleontology of the American Museum of Natural History were very helpful with specimens and data, some of which had not previously been published. To all of these people we are most grateful.

GEOLOGY

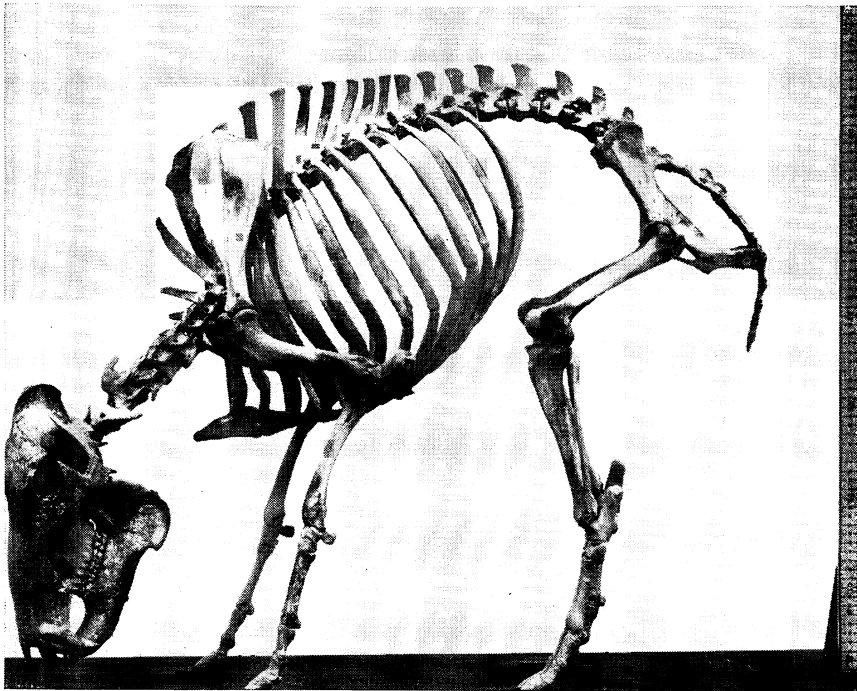
Seeley Creek, a northward-flowing tributary of Chemung River, is in a narrow valley about 500 to 700 feet deep, carved in essentially flat-lying sandstones and shales of the Susquehanna Group. The area is mantled by the Olean Drift (of MacClintock and Apfel, 1944) of Wisconsinan Age. Mosherville is about 35 miles northeast of the Wisconsinan drift border and about 20 miles south of the Valley Heads moraine (fig. 1, map A). During deglaciation, sand and gravel were laid down by melt-water streams in valleys at the edge of the main ice sheet or adjacent to isolated masses of stagnant ice. When the ice melted, these deposits formed kames or kame terraces that are quite extensive in the valley of Seeley Creek, probably because the creek drains northward and melt-water from the glacier was ponded between the surrounding hills and the edge of the ice sheet.

The kame deposits, whose distribution along a segment of Seeley Creek is shown in figure 1, map B, include both sand and gravel. The

PLATE 1



A. Borrow pit in kame at Mosherville where the fossil was collected, view looking northeast (September 1966). Bare hill in middle distance is top of kame (altitude 1400 feet). Wooded hill in right background is about one-quarter of a mile east of Mosherville.



B. Skeleton of *Platygonus compressus*, U.S.N.M. 23706, from Mosherville, in left lateral aspect. Prepared by Leroy Glenn, Jr., and Gladwyn B. Sullivan and mounted by Sullivan. Scale, graduated in centimeters, 75 cm in length.

gravel, commonly pebbly and cobbly, is poorly sorted and irregularly stratified. The stones are chiefly sandstone and siltstone, but about 10 to 20 percent are limestone. The gravel is leached to depths of 6 to 14 feet and is locally deformed, apparently the result of collapse when the adjacent glacier ice melted away. Above or adjacent to the gravel in some exposures is a well-bedded sand that is also deformed. Overlying the sand and gravel in some places is a layer of colluvium, consisting largely of angular fragments of the local bedrock in a sandy matrix. These three units, gravel, sand, and colluvium, are believed to have been deposited in the following way: The gravel was laid down by melt-water streams adjacent to masses of stagnant glacier ice in valleys close if not immediately adjacent to the ice sheet. The sand was deposited at a point that was perhaps slightly farther from the edge of the main ice mass. Thus, gravel at one place might have been deposited contemporaneously with sand at a point a few hundred yards to perhaps a mile to the south. Both gravel and sand were laid down adjacent to or on top of masses of glacier ice, probably stagnant, that later melted and caused the deposits to collapse. The colluvium is locally derived material carried downslope by local wash, by landslides, or by creep. Some colluvium was deposited immediately after deposition of underlying gravel or sand. Other colluvial deposits nearby, such as those at Daggett (Denny and Lyford, 1963, p. 17), may be only a few hundred years old.

The exposures in the borrow pit show that the kame at Mosherville is composed of gravel overlain by well-bedded sand that contained the *Platygonus* skeleton. The sand is in turn overlain by a lens of colluvium that thickens to the southeast (pl. 2). The materials exposed in the borrow pit are described in table 1.

TABLE 1

Materials exposed in borrow pit in kame near Mosherville
(For distribution, see pl. 2)

Colluvium: coarse sand containing pebbles and angular fragments, poorly sorted, structureless, thickens downslope to southeast.

Sand: coarse, pebbly, poorly sorted, well-stratified, bedding dips to southeast, unit appears to be deformed. Near where bones were found, material includes both coarse-grained and fine-grained sand and a lens of pebble gravel. In places, material shows small-scale crossbedding.

Pebble gravel: coarse sandy matrix, includes a few cobbles, poorly sorted, faintly and irregularly stratified, deformed, pebbles largely sandstone and siltstone, 10 to 20 percent limestone.

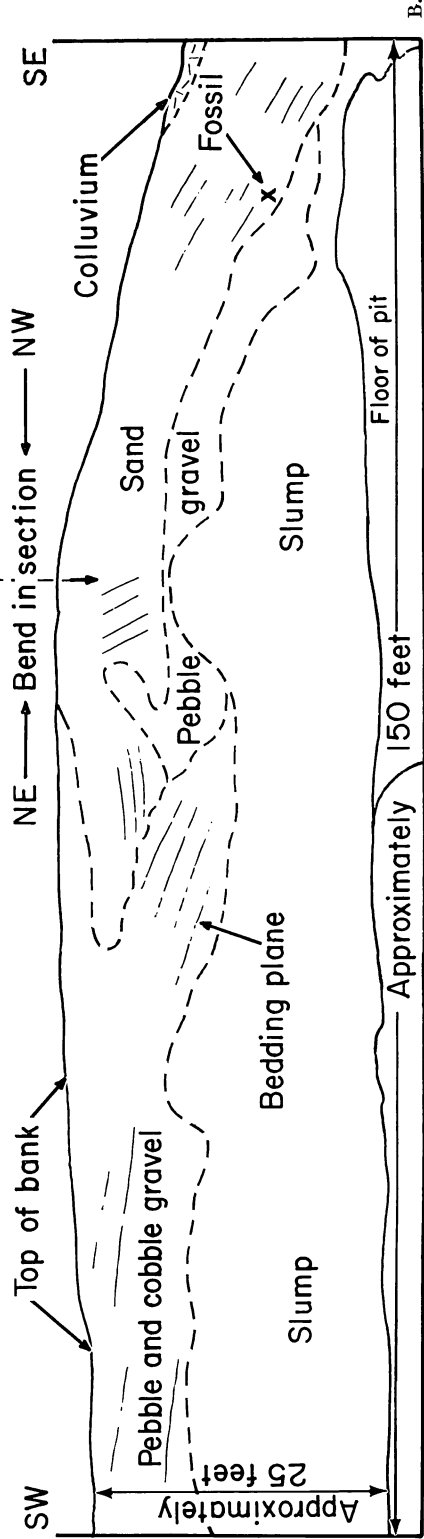
Pebble and cobble gravel: same as above, except coarser grained.

It thus appears that the sand in which the bones were found was probably deposited by a southward-flowing stream a few hundred yards to a few miles south of the retreating edge of the Wisconsinan ice sheet. Perhaps the depositing stream was fed in part by runoff from the adjacent hills. Blocks of stagnant ice, more or less buried by the gravel and

PLATE 2



A.



B.

A. Panoramic view of northwest and northeast sides of borrow pit. (September 1966). For identification of units and location of the fossil, see B.
 B. Diagrammatic cross section of materials that form kame, exposed in northwest and northeast sides of borrow pit. Scale approximate. Outlines of units traced from A. For description of units see table 1. Location of fossil indicated by X near base of sand unit near right hand end of section.

sand, were adjacent to the present conical hill (the kame), perhaps both in the present gully south of the pit and in the valleys of Beckwith and Seeley Creeks to the east and west. A closed depression about 1500 feet southeast of the pit (fig. 1, map B) suggests the melting out of a buried mass of ice after the surrounding kame deposits were formed.

The angular fragments of rock that compose much of the colluvium show no evidence of stream wear; they probably slid or washed down the adjacent bedrock slope just south of the pit at a time before the cutting of the gully just south of the pit. In plate 1-A, the gully extends from right to left between the point from which the photo was taken and the foreground shown in the photo. In the northeast end of the pit, the colluvium thickens to the southeast, in the general direction of the hillside to the south. Thus the colluvium exposed in the pit antedates the cutting of the adjacent gully and probably was deposited soon after the underlying sand (in "late glacial" time) rather than at some later ("postglacial") date.

AGE AND CORRELATION

Many of the ribs belonging to the skeleton were highly fragmentary. These were sacrificed to provide the basis for radiocarbon analysis. The resulting date, $11,900 \pm 750$ years B.P. (W-2006), includes a large plus-minus error because of the known uncertainty in bone dates. Approximately 34 g of bone were processed by boiling in a 10 percent solution of HCl to remove all the carbonate carbon, a younger contaminant from ground water. This slurry was burned to CO_2 and then converted to acetylene in the normal preparation of all samples in the laboratory of the U. S. Geological Survey. As the gas was insufficient for a full loading of the counter, an additional error was introduced by the dilution with a known activity standard. No elaborate processing was attempted because of the unreliability inherent in bone material (Berger, Harney, and Libby, 1964; Haynes, 1968).

The date should be used with caution. It is probably a minimum age for the deposits and, as such, has value in this study. Muller (1965, p. 106-107) believes that the ice sheet had begun to retreat from the Valley Heads moraine more than 12,000 years ago. Thus the peccary probably was entombed in Olean outwash gravel and sand at some time prior to that date; perhaps before 14,000 years B.P. because there is good evidence that Olean drift is older than the Binghamton (Kent) Drift (of MacClintock and Apfel, 1944) of western New York, dated by C-14 as more than 14,000 years old (W-365).

DESCRIPTION OF SKELETON

The specimen consists of the major part of an isolated skeleton (pl. 1-B) of a single individual peccary referable to *Platygonus compressus*. Some damage was done by the earth moving machinery before the fossil came to notice. The skull was broken across the base of the rostrum, and much of the dorsal part of the rostrum was lost, along with most of the right supraorbital region, and the left condyloid and much of the left

coronoid processes. The upper dentition lacks both second incisors; the mandibular dentition lacks all incisors, the right canine, and the left second premolar. The hyoid apparatus is represented by the fused basihyoid and thyrohyals.

The postcranial skeleton lacks the axis, the neural arch of the third cervical vertebra, the distal extremities of most neural spines, all caudal vertebrae, the dorsal border of the right scapula, the distal half of the right radius-ulna, the anterior extremity of the right ilium, both patellae, the right hind limb distal to the femur, the left fibula, the distal extremity of the left tibia, and all bones of the feet excepting left and right fourth metacarpals and the proximal phalanx accompanying the left metacarpal. These three bones of the feet are very poorly preserved, in contrast to the remainder of the skeleton. Many of the ribs are fragmentary, and as noted

TABLE 2
Measurements (mm) of the dentition of *Platygonus compressus*
from Mosherville, Bradford County, Pennsylvania, U.S.N.M. 23706

	Left	Right
Length I ¹ -M ³	150.4	151.7
Length P ² -M ³	68.4	68.2
Length M ¹ -M ³	43.8	42.4
I ¹ Length	6.7	6.9
Width	6.9	7.4
C ¹ Length	15.1	15.9
Width	9.6	9.8
P ² Length	8.4	8.8
Width	8.0	8.5
P ³ Length	9.0	9.0
Width	9.4	9.3
P ⁴ Length	9.6	9.6
Width	11.0	10.9
M ¹ Length	11.3	10.3
Width	12.1	11.8
M ² Length	14.0	13.7
Width	13.6	13.4
M ³ Length	18.6	18.4
Width	14.3	14.6
Length P ₂ -M ₃	—	73.1
Length M ₁ -M ₃	45.0	44.6
C ₁ Length	14.0	—
Width	11.8	—
P ₂ Length	—	8.8
Width	—	6.6
P ₃ Length	10.1	10.0
Width	7.8	7.9
P ₄ Length	10.6	10.3
Width	8.9	8.8
M ₁ Length	11.6	11.4
Width	8.9	8.6
M ₂ Length	14.6	14.0
Width	11.0	11.0
M ₃ Length	20.0	20.7
Width	12.0	12.2

above, most of these were utilized for radiocarbon analysis. For purposes of exhibition, missing and damaged elements were reconstructed on the basis of other referred specimens of *P. compressus*.

Several anomalies may be noted in the specimen. A pathological condition in the right mandibular articulation is indicated by extensive erosion of the glenoid region and the condyloid process. An asymmetrical exostotic growth extends along the subsymphyseal crest of the mandible. The sternum is complete and consists of six sternbrae which together present articular surfaces for no less than eight pairs of costal cartilages. The living peccaries characteristically have six sternbrae and seven pairs of costal cartilages attaching directly to the sternum. A composite skeleton of *Platygonus* from Goodland, Kansas, in the Carnegie Museum has five sternbrae and articulations for six pairs of costal cartilages, as mounted (Peterson, 1914, p. 116; Guilday, personal commun.). A complete sternum from Sandusky County, Ohio, has six sternbrae (Hoare and others, 1964, p. 211). It seems probable that the usual condition in *Platygonus* is six sternbrae and at least seven pairs of directly articulating cartilages.

Skeletal measurements of single individuals of *P. compressus* have been available in only a few instances (see, Williston, 1894; Hoare and others, 1964). Most finds of associated skeletons have been in part destroyed, mixed, dispersed, or incompletely studied, and the several rich population samples from cave localities consist of dissociated elements.

TABLE 3
Measurements (mm) of the skull and mandible of *Platygonus compressus*
from Mosherville, Bradford County, Pennsylvania, U.S.N.M. 23706

	Left	Right
Greatest length of skull		302
Condylbasal length		261
Length of skull from anterior margin of foramen magnum to anterior extremity of premaxillae		256
Anterior border of orbit to extreme end of premaxillae	193	—
Zygomatic breadth		128.5
Breadth of face above P ²		41.4
Depth of zygoma from end of postorbital process to end of preglenoid process	69.4	about 67.5
Depth of zygoma at middle below orbit	32.0	32.5
Dorsoventral diameter of orbit	33.2	—
Greatest breadth of zygomatic expansion below orbit	32.6	32.5
Width of palate between canines		34.8
Width of palate just anterior to P ²		31.6
Width of palate between second premolars		23.6
Width of palate between second molars		19.7
Distance across first molars		47.2
Length of superior precanine diastema	20.0	19.8
Length of superior postcanine diastema	39.1	38.7
Length of temporal fossa from inion to postorbital process	83.0	—
Height of occiput from ventral border of occipital condyles		99.0
Length of inferior postcanine diastema	—	44.5
Depth of mandible below anterior margin of M ₁	40.6	41.3
Depth of mandible at coronoid process	—	93.3
Maximum breadth across thyrohyals		53.8
Length in midline of fused thyrohyals and basihyal		40.6

TABLE 4

Measurements (mm) of the postcranial skeleton of *Platygonus compressus*
from Mosherville, Bradford County, Pennsylvania, U.S.N.M. 23706

	Left	Right
Greatest width of atlas	97.5	
Width of condylar facets of atlas	48.6	
Height of seventh cervical vertebra, tip of neural spine to anteroventral extremity of centrum	74.4	
Height of first thoracic vertebra, tip of neural spine to anteroventral extremity of centrum	122.6	
Height of second thoracic vertebra, tip of neural spine to anteroventral extremity of centrum	148.4	
Height of last lumbar vertebra, tip of neural spine to anteroventral extremity of centrum	57.0	
Length of sacrum (5 vertebrae)	115	
Length of sternum	252	
Scapula		
Length	212	
Width	88	about 88
Anteroposterior diameter of glenoid surface	26.8	28.5
Transverse diameter of same	24.0	25.8
Least anteroposterior diameter of neck	22.1	21.8
Greatest anteroposterior diameter distally, including supraglenoidal tubercle	35.7	33.9
Humerus		
Length	194	195
Length from head to posterior process of inner condyle	169	167
Transverse diameter of proximal articular surface	35.4	35.4
Maximum breadth near proximal end	46.8	47.5
Anteroposterior diameter of shaft just below deltoid tubercle	34.0	33.8
Maximum breadth near distal end, across epicondyles	41.6	39.8
Maximum breadth of distal articulation	30.1	28.8
Radius-ulna		
Length of ulna	211	—
Length of radius	160	—
Width of sigmoid fossa	29.3	27.7
Least width of conjoined bones	22.9	24.7
Greatest breadth of distal portion of conjoined bones	39.7	—
Greatest breadth of distal articular surface	35.7	—
Metacarpal IV		
Length	84	82
Proximal phalanx, digit IV		
Length	36.0	—
Innominate		
Greatest length	238	—
Center of acetabulum to anterior border of ilium	126	—
Center of acetabulum to posterior border of ischium	120	119
Diameter of acetabulum	30.8	29.9
Length of pubic symphysis		78
Longest diameter of obturator foramen	40.7	41.9
Femur		
Length	190	about 189
Anteroposterior diameter of head	25.6	25.0
Transverse diameter of head	about 32	about 31
Transverse diameter of condyles	45.3	—
Transverse diameter of trochlea	22.5	20.8
Tibia		
Width of proximal end	46.4	—

TABLE 5

Measurements (mm), crown length of upper and lower cheek tooth rows of some specimens of *Platygonus compressus*.

Locality	P ² -M ³	P ₂ -M ₃	Source
Valsequillo, Puebla, Mexico	89.9	—	Specimen under study in U.S.N.M.
Guajuato, Mexico	89.7 (min)	90.0	Lower dentition from U.S.N.M. 791, part of type of <i>P. acemani</i> ; upper from Duges, 1887, pl. 1, fig. 1 (verifiable figures in his pl. 1 are in fact smaller than the indicated natural size)
Rancho La Brea, Los Angeles County, Calif.	82.2	—	Merriam and Stock, 1921, p. 15
Papago Springs Cave, Santa Cruz County, Ariz.	82.8 left, 81.5 right	—	F:A.M. 42781, old adult
	85.6 left	—	F:A.M. 42782, young adult
	84.0 left	—	F:A.M. 42783, young adult
	80.4 right	85.5 right	F:A.M. 42784, subadult
Laubach Cave, Williamson County, Tex.	83.6, 80.8-87.9, 6	86.0, 80.1-92.9, 12	Slaughter, 1966b, p. 490-491
Devil's Den Mine, Fissure no. 1, 2¼ miles northwest of Williston, Levy County, Fla.	83.3 left, 84.5 right	86.3 left, 85.2 right	F:A.M. field no. Fla. 6-90, adult
	86.8 right	—	F:A.M. field no. Fla. 6-105, adult
Goodland, Sherman County, Kansas	75.3, 71-80, 3	79.6, 75-82, 5	Williston, 1894, p. 26-27
Cherokee Cave, St. Louis, Mo.	75.7 left, 74.7 right	—	A.M.N.H. 45701, old adult
	73.1 left	—	A.M.N.H. 45703, old adult
	81.3 right	81.1 right	A.M.N.H. 45762, adult
	—	77	A.M.N.H. 45724, adult
Beiding, Ionia County, Mich.	78	—	Wagner, 1903, p. 778-779

Columbus, Franklin County, Ohio	77.2	about 78.5	U.S.N.M. 16577 (lower dentition measured from root of P ₂)
Near Fremont, Sandusky County, Ohio	75.0	78.7	Hoare and others, 1964, p. 212-213
Garfield Heights, Cuyahoga County, Ohio	75.8 74.7	78.1 —	C.N.S.M. 10009, Dunkle, personal commun. C.N.S.M. 10010, Dunkle, personal commun.
Near Cortland, Trumbull County, Ohio	67.8	—	C.N.S.M. 10011, Dunkle, personal commun.
Mosherville, Bradford County, Pa.	68.4 left, 68.2 right	73.1 right	U.S.N.M. 23706
Near Gainesville, Wyoming County, N.Y.	—	79.0 left, 79.3 right	N.Y.S.M., Fisher, personal commun., upper den- tition temporarily unavailable
Pittsford?, near Rochester, Monroe County, N.Y.	74, 74	80	Leidy, 1889, p. 47

[Localities in which specimens were found are arranged geographically, from south and west to north and east. Data for the Laubach Cave and Goodland samples include mean, observed range, and number of individuals, in that order. All occurrences are certainly or very probably of late Wisconsinan age with the possible exception of the Devil's Den Mine assemblage which has not been analyzed. Abbreviations in right-hand column include A.M.N.H. (American Museum of Natural History), C.N.S.M. (Cleveland Natural Science Museum), F: A.M. (Frick American Mammals, A.M.N.H.), N.Y.S.M. (New York State Museum), and U.S.N.M. (United States National Museum).]

Thus, it has seemed desirable to present measurements of the dentition and skeleton of the individual from Mosherville (tables 2-4).

Comparison directly with specimens and with published measurements of specimens from elsewhere in North America shows the Mosherville individual to be among the smallest *Platygonus* thus far reported. In measurements of most individual teeth, for example, it falls at or below the minimum size observed in the samples from Laubach Cave, Texas, Cherokee Cave, Missouri, and Goodland, Kansas (Slaughter, 1966b, table 3).

Table 5 lists several occurrences that are all more or less certainly of late Wisconsinan Age and that consist in each case of at least one complete upper or lower cheek tooth series of *P. compressus* (including *P. alemanii*; compare Slaughter, 1966b, p. 489). These localities range geographically from central Mexico to the northeastern United States. The lengths P^2-M^3 and P^2-M_3 were selected for comparison because they are available with sufficient frequency in specimens and in the literature, they are large enough to be meaningfully compared even though measured by many different people, and they are probably correlated closely with the size of the animal. These examples rather strongly suggest a clinal decrease in size northward, a negative Bergmann's response. Simpson (1949, p. 44) pointed out the great desirability of comparing multiple population samples of *Platygonus compressus* in space and time. Samples are still far too few, and dating and correlation are too imprecise to permit sure distinction between variation in space and in time; however, enough material is now in collections to test the suggested clinal variation, when specimens in widely scattered institutions have been measured (preferably by one person) and when reports on newly discovered population samples (in Arkansas, Colorado, and Kentucky) have been published.

The individual from Mosherville may be regarded as a small, probably female, old adult individual of *Platygonus compressus*.

DISCUSSION

Most authors, undoubtedly influenced initially by the distribution of the living peccaries, have regarded *Platygonus* as an interglacial or warm-southerly climatic indicator. Hay repeatedly implied a southerly climatic significance for *Platygonus compressus*. For example, in reference to the occurrence at Belding, Michigan, he states (1923, p. 216), "It is more probable that they lived there long after this retirement [of Wisconsinan ice into Lake Michigan], at a time when the climate had become much warmer", and in connection with the find near Rochester, New York (1923, p. 212), "The peccaries possibly lived rather early in the late Wisconsin stage; but more probably . . . considerably later, when the climate had become milder". According to Dorf (1959, p. 196, 198), "In Pennsylvania there are interglacial records . . . of peccaries whose nearest living relatives range only as far north as Arizona, New Mexico, and Texas". Lundelius (1967, p. 297) has regarded *Platygonus* sp. as the late

Wisconsinan ecological equivalent of the modern collared peccary in central Texas.

Slaughter has commented repeatedly upon the ecological significance of *Platygonus compressus*, for example, as follows:

. . . all of the reported occurrences . . . listed by Hibbard (1957) [1958] as Wisconsin in age, are from areas whose temperatures were probably not affected greatly during glacial stages . . . California, Arizona, and Florida. As a matter of fact, Brown (1901) [1908] considered *Platygonus* the Pleistocene plains peccary and *Mylohyus* the more woodland type. This observation seems to be strengthened with a look at the southern fossil faunas, with *Mylohyus* being the peccary genus represented in deposits of glacial age . . . and *Platygonus* . . . in the interglacial . . . (1961, p. 314).

This occurrence . . . [in the Moore Pit local fauna] is in accordance with the oft-mentioned observation that this genus may have been a warm-weather type, since it is found in all interglacial local faunas of Texas and adjacent states, while *Mylohyus* is the genus represented in local faunas belonging to glacial stages of the same area. (1966a, p. 81).

Hibbard's (1958) paper cannot be used meaningfully for the purpose intended by Slaughter (1961). Hibbard explicitly pointed out (p. 10) that "a great number of isolated finds of extinct mammals in North America occur in deposits of Wisconsin age, and especially in the drift area. . . . It is impossible to list here all geographical occurrences of . . . large mammals known chiefly from isolated finds", and, further (p. 26), that he did not list all Wisconsinan local faunas. The Wisconsinan local faunas containing *Platygonus* listed by Hibbard for his purposes include Cherokee Cave, Missouri; Jones Ranch, Kansas; McKittrick, Potter Creek Cave, and Rancho La Brea, California; and Papago Springs Cave, Arizona—a sample strongly biased toward the southwestern United States, by no means reflecting the true late Wisconsinan distribution of *Platygonus*, and not intended to do so. Slaughter's argument does not take into account the many important, probably late Wisconsinan, finds of *P. compressus* from areas where temperatures probably were affected greatly during glacial stages—Illinois, Kentucky, Michigan, Ohio, Pennsylvania, and New York.

With special reference to the specimens from Gainesville, New York, and Columbus, Ohio, Clarke (1916, p. 34-35) states, "the remains are always found within the area occupied by the Wisconsin drift . . . it is therefore inferred that these peccaries took possession of the northern states soon after the withdrawal of the last . . . ice sheet. . . . Doubtless . . . fierce snow storms raged at times in the northern states. It is therefore assumed that these peccaries were overcome by heavy snow storms or blizzards, as frequently happens to gregarious animals . . .". Hay (1923, p. 214, 216) suggested that the occurrence of multiple individuals at Columbus, Ohio, and Belding, Michigan, resulted from herds having been frozen to death during winter blizzards. Matthew (1932, p. 186) felt that "the tapirs of the New Jersey and Pennsylvania Pleistocene . . . afford some indication of an interglacial climate warmer than now; the peccaries, belonging to extinct genera, have no serious weight, and there

is good reason to believe that they were adapted to a much more northerly climate than their living relatives . . .”.

The conclusion seems all but inescapable that the peccary from Mosherville died within a few miles of the margin of the wasting late Wisconsinan continental glacier, and that it had lived there in a periglacial environment. Hartnagel and Bishop (1922, p. 85-86, pl. 24) have described the geologic occurrence of the peccaries from Gainesville, New York (see fig. 1, map A), in an isolated drumlin-like hill approximately 0.6 mile northwest of Gainesville. This isolated feature is well shown on the Warsaw, New York, 7.5-minute quadrangle, U. S. Geological Survey. Whether the hill is a true drumlin or, as seems more probable, is an isolated kame, its character suggests a glacial-age deposit comparable to that at Mosherville. Unfortunately, other published northerly occurrences have not been sufficiently well documented stratigraphically or adequately related to the glacial sequence: Belding, Michigan (Wagner, 1903); Sandusky County, Ohio (Hoare, 1964); Columbus, Ohio (Klippart, 1875); Rochester, New York (Hay, 1923, p. 212). All, however, are of probable late Wisconsinan Age.

An ecological factor other than temperature may be critical in resolving the apparent conflict. Several authors (Brown, 1908, p. 200; Lundelius, 1960, p. 34; Slaughter, 1961, p. 314, 1966b, p. 478) have pointed out that *Mylohyus* probably preferred the woodlands and *Platygonus* the more open plains. The interpretation of *Mylohyus* as a woodland form is supported by morphology, faunal associations, preponderantly eastern distribution (Lundelius, 1960, p. 34, is quite correct in rejecting the record from Anita, Arizona), relative rarity, and apparently solitary habits (large population samples are unknown). The few well-founded western records for *Mylohyus* may be attributable to the flourishing of gallery forests along streams during wet intervals (compare, Semken and Griggs, 1965, fig. 2 and p. 272). Interpretation of *Platygonus* as an open country form is supported by faunal associations, wide distribution in the United States, including the Plains and Far West, occurrence in loess, relative abundance, and apparently gregarious habits (frequent occurrence of multiple individuals). If *Platygonus* is a valid interglacial-interstadial indicator in Texas, might it not reflect a response to expansion of the open-country habitat at the expense of the woodland (if that was indeed the case) rather than to warm climate in itself?

An interpretation seemingly in accord with the presently known facts would represent *Platygonus compressus* as a species having broad climatic tolerance and ranging at least from Mexico through the northeastern United States, from a nonglacial to a periglacial environment. This would be compatible with the suggested clinal decrease in size northward (table 5). The species would have been rather strongly tied to open country, perhaps extending its range only briefly from population

reservoirs in the Plains into the northeastern United States, where it occupied recently deglaciated terrain prior to reforestation and replacement by *Mylohyus*. In this probably marginal, inhospitable habitat, body size would have been reduced to the minimum.

Whether accumulating evidence will be in accord with the above hypothesis or not, it does seem that *Platygonus compressus* furnishes an example in which the ecology of living members of a group does not provide a reliable key to that of an extinct member, even a member of rather close relationship and reasonably similar morphology.

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