

## AMS RADIOCARBON DATES FROM PLEISTOCENE AND HOLOCENE MAMMALS HOUSED IN THE NEW YORK STATE MUSEUM, ALBANY, NEW YORK, USA

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### INTRODUCTION

Despite its rich paleontological record, only limited research has been published on the Pleistocene and Holocene vertebrate faunal record of New York State. This paper presents a set of dates from the bone collagen of Pleistocene and Holocene mammal specimens housed in the Vertebrate Paleontology Collections at the New York State Museum, Albany, New York, USA.

To obtain the appropriate samples, the preparation procedures generally follow Brown et al. (1988) and Bronk Ramsey et al. (2004). Samples were first decalcified using 0.5N HCl to obtain collagen, generally for 24–48 hr. Once decalcified, collagen was then gelatinized at 58 °C for 16 hr. Afterwards, the gelatin solution was filtered to remove any remaining solids. The solution was then ultra-filtered to remove the 30-kD fraction, which was then lyophilized. In general, lyophilized collagen appeared similar to a white cotton ball. Graphitization and analysis were conducted at the National Oceanic Sciences Accelerator Mass Spectrometry (NOSAMS) facility. All dates were calibrated using the online CALIB 5.0.2 program (Stuiver et al. 2005). The calibrated dates reported below represent the 2- $\sigma$  age range.

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### RESULTS

#### Localities

Dutchess Quarry Caves (Orange County, New York)

**NOSAMS OS-66473**

**12,900 ± 70 <sup>14</sup>C BP**

**RSF 07-C14-019. NYSM VP-9370**

**$\delta^{13}\text{C} = -17.56\text{‰}$**

Bone collagen from the left tibia of Cervidae specimen. Dutchess Quarry Cave #1, Stratum 2 (41°21'35"N, 74°21'49"W). NY State Museum Vertebrate Paleontology Locality: VPL-61. 15,000–15,500 cal BP.

**NOSAMS OS-65556**

**12,900 ± 50 <sup>14</sup>C BP**

**RSF 07-C14-020. NYSM VP-9371**

**$\delta^{13}\text{C} = -17.80\text{‰}$**

Bone collagen from the left tibia of Cervidae specimen. Dutchess Quarry Cave #1, Stratum 2 (41°21'35"N, 74°21'49"W). NY State Museum Vertebrate Paleontology Locality: VPL-61. 15,000–15,500 cal BP.

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**NOSAMS OS-68666** **1840 ± 35 <sup>14</sup>C BP**  
**RSF 08-C14-018. NYSM VP-5541** **δ<sup>13</sup>C = -22.26‰**  
 Bone collagen from the distal phalanx of *Odocoileus virginianus* specimen. Dutchess Quarry Cave #1, Stratum 2 (41°21'35"N, 74°21'49"W). NY State Museum Vertebrate Paleontology Locality: VPL-61. 1700–1870 cal BP.

*Comments:* There are a limited number of known Pleistocene-aged localities containing abundant vertebrate fossil remains in NY State (Laub et al. 1988; Laub 2003). One of the exceptions in eastern New York are the Dutchess Quarry Caves, located on Mount Lookout, near Goshen, New York, which have yielded abundant Pleistocene- and Holocene-aged archaeological and paleontological material (Hartnagel and Bishop 1922; Funk and Steadman 1994; Steadman et al. 1997). Based on previous radiocarbon dates (Funk and Steadman 1994; Steadman et al. 1997), it was suggested that Dutchess Quarry Cave (DQC) #1 Stratum 2 was entirely late Pleistocene in age. The deer bones dated here suggest that while Pleistocene-aged material is represented in this layer, intrusion of younger material into this stratum has occurred. Therefore, other specimens from DQC #1 Stratum 2 cannot be assigned to a particular time interval. NYSM VP-9370 and NYSM VP-9371 are fragments from the same tibia.

Hansen Rockshelter (Orange County, New York)

**NOSAMS OS-71314** **410 ± 15 <sup>14</sup>C BP**  
**RSF 07-C14-017** **δ<sup>13</sup>C = -19.89‰**  
 Bone collagen of an ulna of *Procyon lotor*. Hansen Rockshelter Square 8, Stratum A. NY State Museum Vertebrate Paleontology Locality: VPL-64. 470–510 cal BP.

**NOSAMS OS-65555** **2050 ± 30 <sup>14</sup>C BP**  
**RSF 07-C14-018** **δ<sup>13</sup>C = -23.92‰**  
 Bone collagen of a metacarpal of *Procyon lotor*. Hansen Rockshelter Square 2, Stratum A. NY State Museum Vertebrate Paleontology Locality: VPL-64. 1930–2110 cal BP.

*Comments:* Hansen Rockshelter (also known as Lone Mink Rockshelter) is located near the town of Minisink, New York. A census of the specimens in the NY State Museum Vertebrate Paleontology Collections shows that at least 28 different taxa are represented in the Hansen Rockshelter deposits. The 2 dates imply that stratum A is Early to Late Woodland period in age.

### Fauna

NYSM VP-41: Flat-headed peccary, *Platygonus compressus* (Wyoming County, New York)

**NOSAMS OS-68051** **10,750 ± 50 <sup>14</sup>C BP**  
**RSF 07-C14-016** **δ<sup>13</sup>C = -20.59‰**  
 Bone collagen from a rib fragment. NY State Museum Vertebrate Paleontology Locality: VPL-38. 12,700–12,900 cal BP.

*Comments:* The remains of 2 individuals of *P. compressus* were discovered near Gainesville, New York, in 1912 (Hartnagel and Bishop 1922). At least 2 other individuals are known from near Rochester, New York. While peccaries are restricted to the southwest USA today, at least 3 different species are known from around the Great Lakes states in the late Pleistocene (Holman 2001).

NYSM VP-47: Giant beaver, *Castoroides ohioensis* (Wayne County, New York)

**NOSAMS OS-73632** **10,150 ± 50 <sup>14</sup>C BP**  
**RSF 08-C14-019** **δ<sup>13</sup>C = -20.71‰**

Bone collagen from left squamosal. New York State Museum Vertebrate Paleontology Locality: VPL-60. 11,500–12,000 cal BP.

*Comments:* This nearly complete cranium of *C. ohioensis* was discovered in Clyde, New York, in 1845, and is one of the earliest specimens in the NY State Museum's collections. This species has been found in Pleistocene sites across the state, and is well known from states around the Great Lakes (Holman 2001). The date for this specimen confirms it as being Pleistocene in age.

NYSM VP-96: Horse, *Equus caballus* (Albany County, New York)

**NOSAMS OS-71412** **155 ± 15 <sup>14</sup>C BP**  
**RSF 08-C14-017** **δ<sup>13</sup>C = -19.75‰**

Bone collagen obtained from cranium fragment. NY State Museum Vertebrate Paleontology Locality: VPL-43. Discovered during the "South Mall" excavation, which resulted in the formation of the Empire State Plaza, Albany, New York. 0–280 cal BP.

NYSM VP-97: Horse, *Equus caballus* (Albany County, New York)

**NOSAMS OS-71327** **195 ± 15 <sup>14</sup>C BP**  
**RSF 08-C14-022** **δ<sup>13</sup>C = -18.91‰**

Bone collagen obtained from dentary fragment. Specimen uncovered in 1964 on the south side of the Mohawk River in Latham, New York, under 2–3 m of sand, gravel, and cobbles by R Batchelder (Albany, New York) using a bulldozer. Specimen identified by R Funk of NY State Museum. Specimen previously cataloged as NY State Zoology No. 21541 and Paleo No. V81. NY State Museum Vertebrate Paleontology Locality: VPL-68. 0–290 cal BP.

*Comments:* Although there are abundant Pleistocene-aged mammals from New York, it is unclear whether Pleistocene-aged horse species are present in the state. The dates from these 2 sampled horses confirm the bones to be from recent burials of the modern species, *Equus caballus*, rather than from Pleistocene species.

NYSM VP-98: Stag-moose, *Cervalces scotti* (Orange County, New York)

**NOSAMS OS-68051** **10,800 ± 45 <sup>14</sup>C BP**  
**RSF 07-C14-015** **δ<sup>13</sup>C = -20.09‰**

Bone collagen from a vertebra fragment. NY State Museum Vertebrate Paleontology Locality: VPL-66. 12,800–12,900 cal BP.

*Comments:* This specimen is likely the same specimen previously dated by Buckley and Willis (1970) and reported by Funk et al. (1970) as the *C. scotti* (NYSM 24123) from the Dewey Parr locality (I-4016: 10,950 ± 150 <sup>14</sup>C BP). The calibrated range of this more recent date falls within the calibrated range previously obtained.

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