New Remains of Middle Miocene Equids from the Cajon Valley Formation, San Bernardino National Forest, San Bernardino County, California

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TLDR:

- "Parahippus" *brevidens* made it to Southern California
- *Scaphohippus* contains only one species, *S. sumani*
- The Cajon Valley Formation is faunally distinct from the nearby Barstow Formation, which could have ecological implications

Pick a Print

S. sumani P4

S. sumani DP3

A. mourningi DP4

"P." *brevidens* M1

Scaphohippus sumani dentary

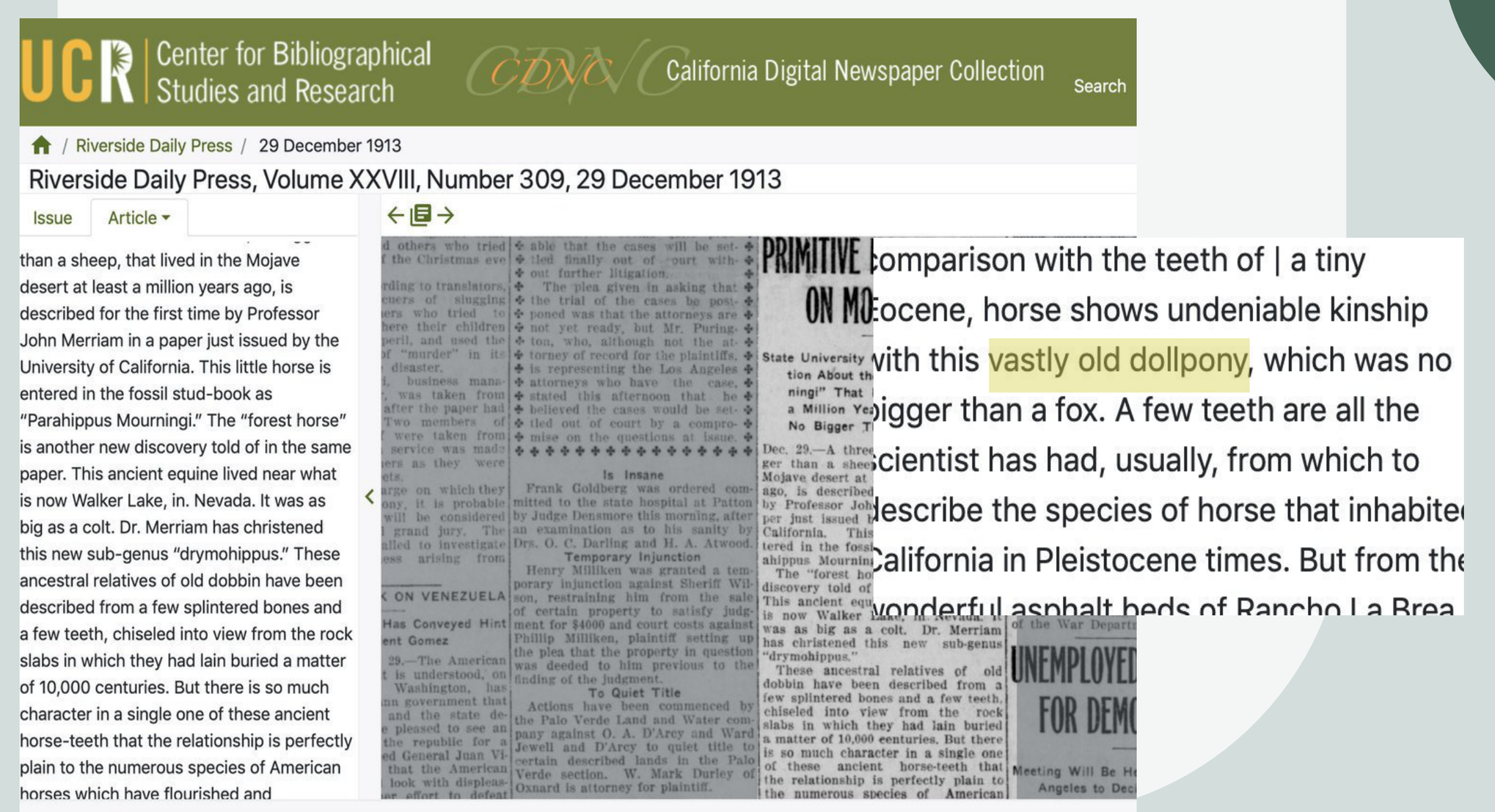
Introduction

The Cajon Valley Formation, located partially in the San Bernardino National Forest, spans the late Hemingfordian and early Barstovian North American Land Mammal Ages. Previously considered part of the Punchbowl Formation, the Cajon Valley Formation has been excavated by various institutions since the 1970s, most notably by the University of California, Riverside (UCR) and San Bernardino County Museum (SBCM).

The majority of these fossil collections are now housed at University of California, Berkeley, SBCM, and Western Science Center (WSC), the last of which began work in 2018. Excavation of a quarry in the Cajon Valley Formation by WSC yielded new fossil material including remains of three equid taxa: *Archaeohippus mourningi*, *Scaphohippus sumani*, and the first record of "Parahippus" *brevidens* south of North Coalinga, CA.

The "Doll Pony"

Excavations by John Merriam in the early 20th century made the news - and led to the moniker "doll pony" for these small Miocene horses!



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Riverside Daily Press / 29 December 1913

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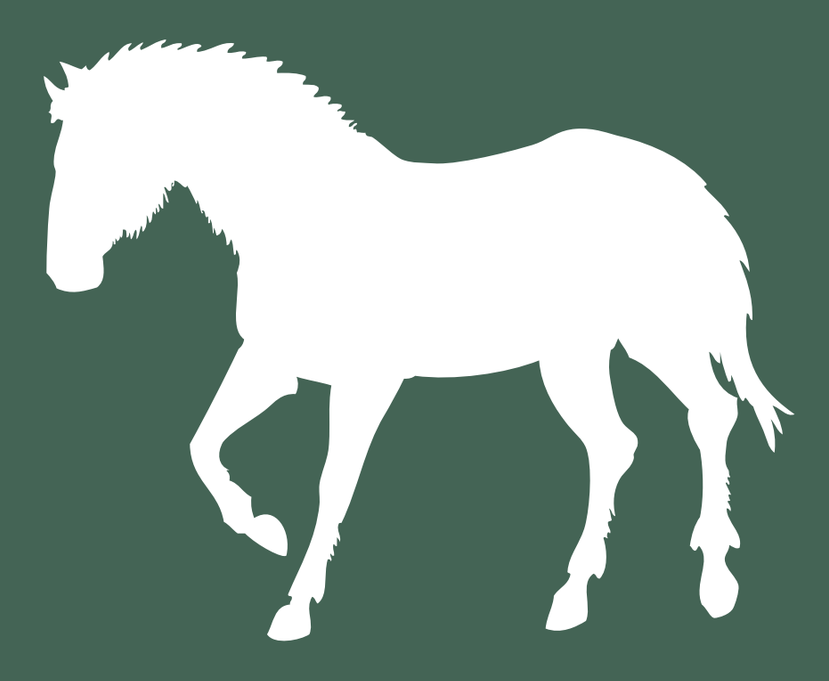
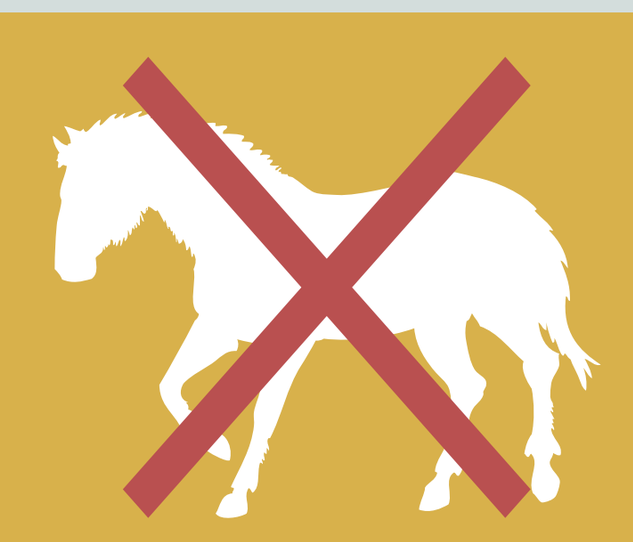
than a sheep, that lived in the Mojave desert at least a million years ago, is described for the first time by Professor John Merriam in a paper just issued by the University of California. This little horse is entered in the fossil stud-book as "Parahippus Mourningi." The "forest horse" is another new discovery told of in the same paper. This ancient equine lived near what is now Walker Lake, in. Nevada. It was as big as a colt. Dr. Merriam has christened this new sub-genus "drymohippus." These ancestral relatives of old dobbin have been described from a few splintered bones and a few teeth, chiseled into view from the rock slabs in which they had lain buried a matter of 10,000 centuries. But there is so much character in a single one of these ancient horse-teeth that the relationship is perfectly plain to the numerous species of American horses which have flourished and

...comparison with the teeth of | a tiny ...ocene, horse shows undeniable kinship with this vastly old dollpony, which was no bigger than a fox. A few teeth are all the scientist has had, usually, from which to describe the species of horse that inhabited California in Pleistocene times. But from the wonderful asphalt beds of Rancho La Brea



Scaphohippus sumani

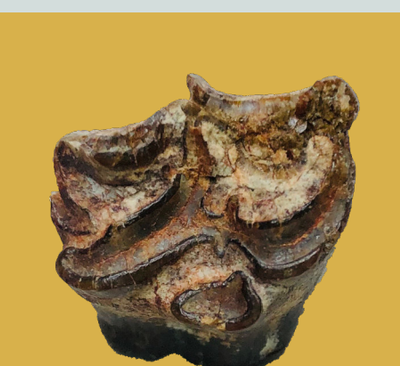


Scaphohippus intermontanus

The genus *Scaphohippus*, named by Darrin Pagnac in 2006, currently consists of two species: *S. sumani* and *S. intermontanus*, both of which were originally included in the genus *Merychippus* (Merriam 1915). Both species overlap in time. Furthermore, we propose that previously cited differences in plication morphology and wear patterns are not sufficient to distinguish two taxa. We assert that based on observed full palates of both species, there is actually only one species: *Scaphohippus sumani*, which has taxonomic priority.

Scaphohippus intermontanus
LACM 4941, Bopesta Formation

Scaphohippus sumani
LACM 33847, Barstow Formation



WSC 8933
S. sumani
upper right DP3

WSC 8934
S. sumani
upper left M3?

WSC 8922, *S. sumani*
partial right dentary

Parahippus brevidens

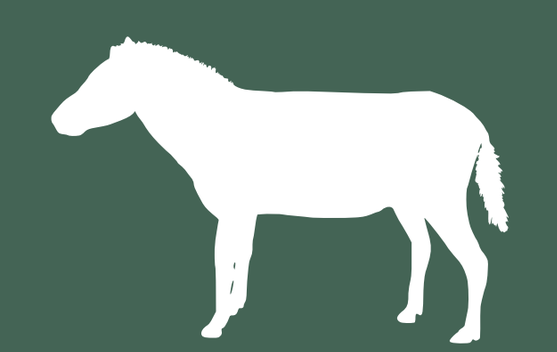
YPM 11274
"P." *brevidens* holotype
Mascall Formation

LACM 1146
"P." *brevidens* M?
Temblor Formation

WSC 8914
"P." *brevidens* upper M1
Cajon Valley Formation

What's In a Name?

The name "Parahippus" *brevidens* (Marsh 1874) is used to describe these specimens. While "*P.*" brevidens has been previously referred to *P. avus* or *Desmatippus avus* (Downs 1956), we maintain that "*P.*" *brevidens* is a distinct and valid taxon (Bode 1933).

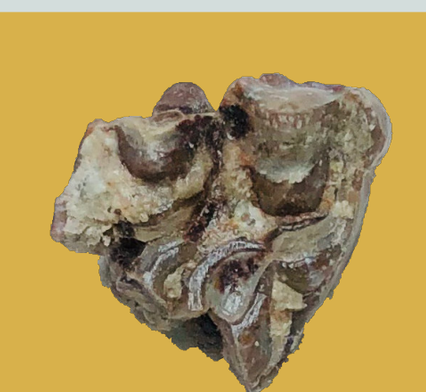


Archaeohippus mourningi

Previous authors have identified *Archaeohippus mourningi* from the Cajon Valley Formation (Pagnac and Reynolds 2010) from Tcv3 and Tcv5. We have confirmed these observations with new material from Tcv5.

WSC 8801
A. mourningi
lower left P2

WSC 8816
A. mourningi
upper left DP4

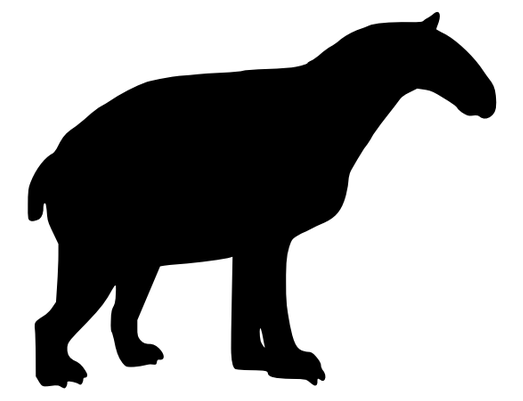


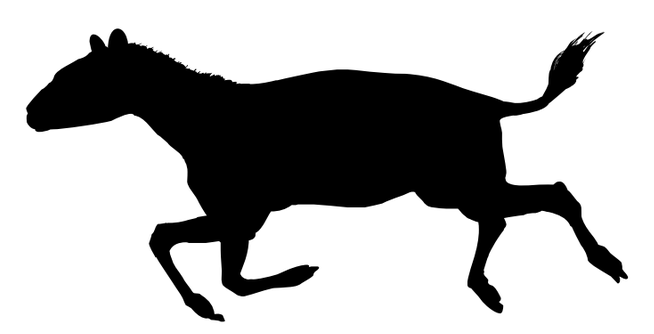
WSC 8826
A. mourningi
upper right M3

Ecological Implications

While similar in time and nearby geographically, some Cajon Valley Formation and Barstow Formation fauna are exclusive of each other, which might have implications for the Miocene paleoecology of both areas.

Cajon Valley Formation	Barstow Formation
SMALL-BODIED	
Scaphohippus sumani	*Scaphohippus sumani*
"Parahippus" *brevidens*	No occurrence
Archaeohippus mourningi	Comparatively rare
LARGE-BODIED	
Chalicotheres	*Hypohippus affinis* and *Megahippus mckennai*





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