

# The Untold Story of the Carnegie *Diplodocus*

Mike Taylor<sup>1,\*</sup>, Matt Lamanna<sup>2</sup>, Ilja Nieuwland<sup>3</sup>,  
Amy Henrici<sup>2</sup>, Linsly Church<sup>2</sup>, Steve Sroka<sup>4</sup> and  
Ken Carpenter<sup>5</sup>

1. University of Bristol, Bristol, UK
2. Carnegie Museum of Natural History, Pittsburgh, PA, USA
3. Royal Netherlands Academy of Arts and Sciences, Netherlands
4. Utah Field House of Natural History, Vernal, Utah, USA
5. University of Colorado Museum, Boulder, Colorado, USA



The  
sauropod  
dinosaur  
*Diplodocus*

Best known  
from the  
Carnegie  
specimen  
“CM 84”





The  
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dinosaur  
*Diplodocus*

Best known  
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“CM 84”

“Dippy”





... And its  
many casts



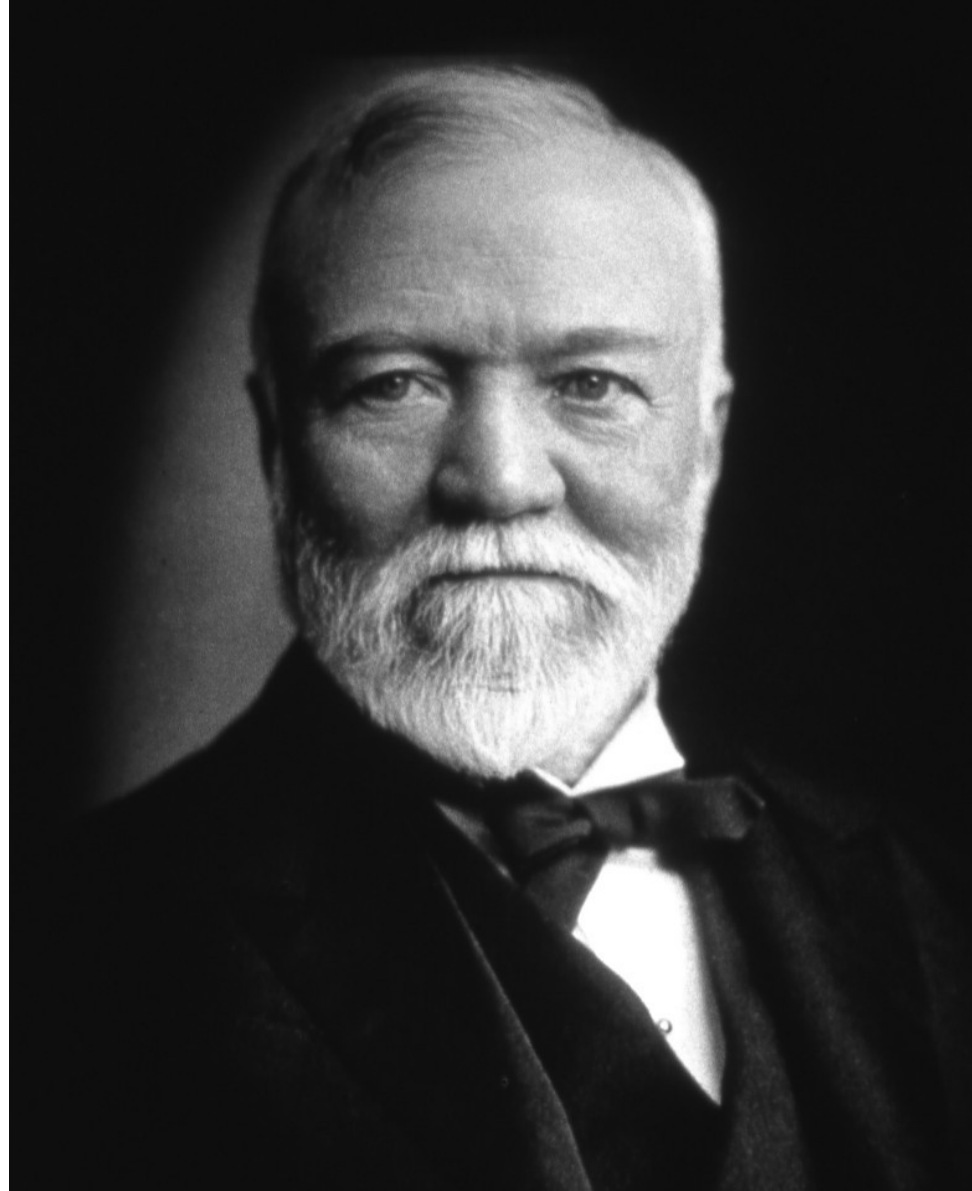


# Funded by Andrew Carnegie

The Carnegie Museum.

*Diplodocus carnegii*:

- Excavation
- Mounting
- Molding
- Casts





## Casts were sent around the world in the early 1900s.

Natural History Museum	<b>London</b>	England	12 May 1905
Museum für Naturkunde Berlin	<b>Berlin</b>	Germany	13 May 1908
Muséum National d'Histoire Naturelle	<b>Paris</b>	France	15 June 1908
Kaiserliches und königliches naturhistorisches Hof-Museum	<b>Vienna</b>	Austria	24 September 1909
Giovanni Capellini Museum for Paleontology and Geology	<b>Bologna</b>	Italy	27 October 1909
The Imperial Museum	<b>St. Petersburg</b>	Russia	Early July 1910
Museo de La Plata	<b>La Plata</b>	Argentina	1912
Museo Nacional de Ciencias Naturales	<b>Madrid</b>	Spain	2 December 1913
Museo de Paleontología (UNAM)	<b>Mexico City</b>	Mexico	1930
Staatssammlung für Paläontologie und Geologie	<b>Munich</b>	Germany	1934 (never mounted)



The original  
skeleton was  
mounted in  
1907





# The composition of the mounted “skeleton” was complex

## *Bones*

**CM 84:** neck, torso, ribs, sacrum, 12 proximal caudals, left scapulocoracoid, sternal plates, right ilium, pubes, ischia, left femur

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**CM 94:** right scapulocoracoid, lower right hindlimb and much of the tail

**CM 307:** the rest of the tail

**CM 33985:** lower left hindlimb

**CM 21775:** left forelimb



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## *Sculptures*

CM 662: sculpted right forelimb

AMNH 965: sculpted forefeet

CM 662: sculpted braincase

USNM 2673: sculpted remainder of skull

Pure sculpture: axis, left ilium, femur and tibia

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**Something  
wrong here**



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*Missing:* clavicles, interclavicle, sternal ribs, gastralia

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Based on skeletal reconstruction by Scott Hartman  
Used by permission



# Skull replacement (between 1924 and 1971)

CM 662 braincase +  
USNM 2673 remainder of skull



CM 11161  
skull



# Forefoot epic part 1. Original Paris mount

AMNH 965 camarasaurid





## Forefoot epic part 2. 2007 re-pose at HMN

AMNH 965 camarasaurid



# Forefoot epic part 3. 1999 forefoot update

CM 662 "*Diplodocus*" *hayi*  
(= *Galeamopus hayi*)





## Forefoot epic part 4. 2007 remount

WDC-FS001A

Referred to *D. carnegii*  
but probably not *Diplodocus*.





# Forelimb problems





# Forelimb problems





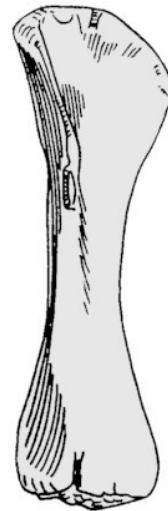
# Forelimb problems





*Diplodocus* sp. AMNH 5855  
left humerus, anterior view (reversed)

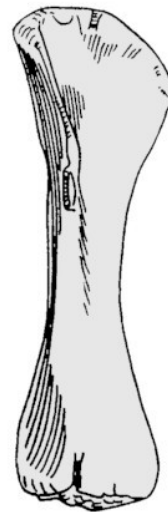
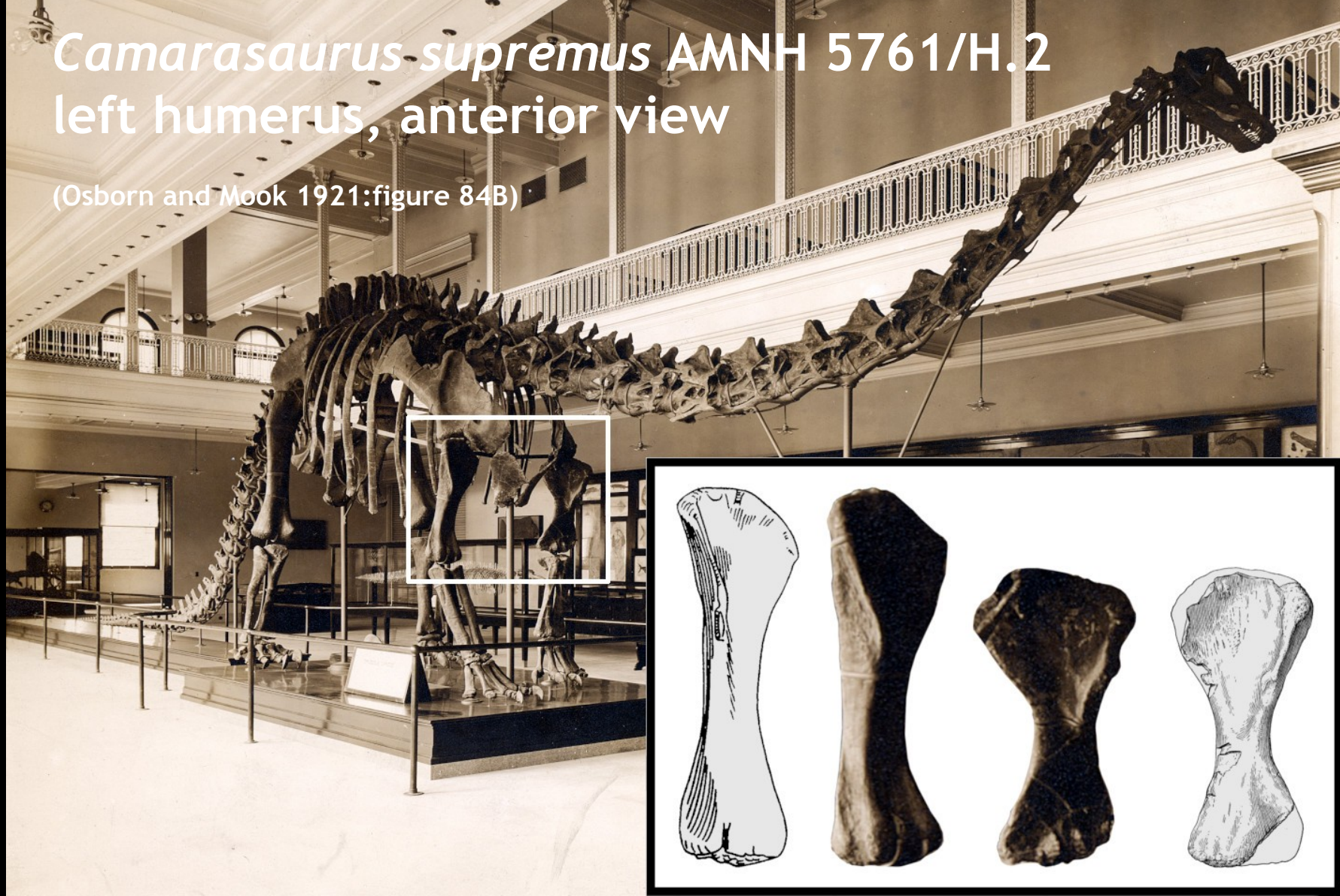
(Mook 1917:figure 2A)





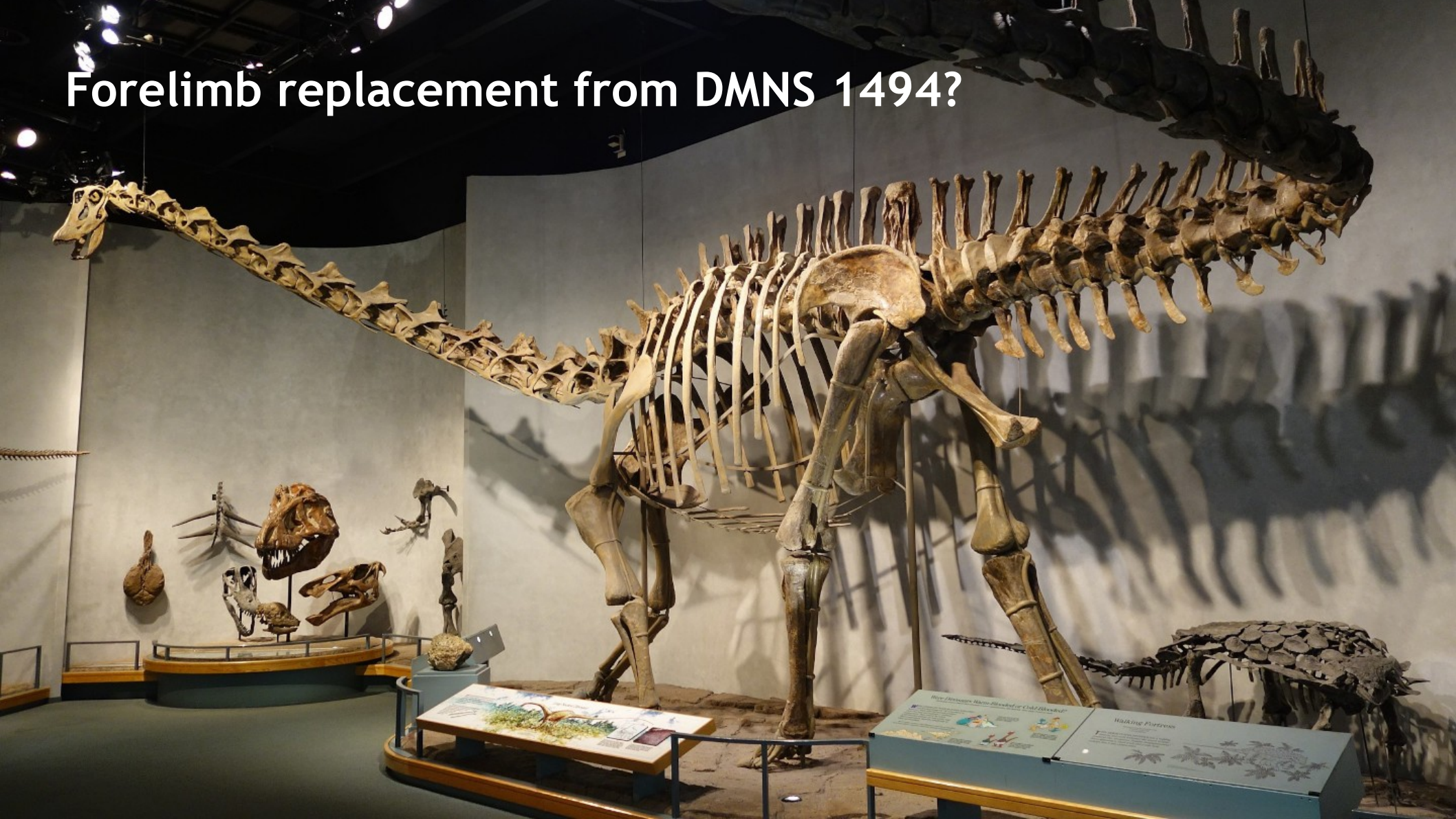
# *Camarasaurus supremus* AMNH 5761/H.2 left humerus, anterior view

(Osborn and Mook 1921:figure 84B)





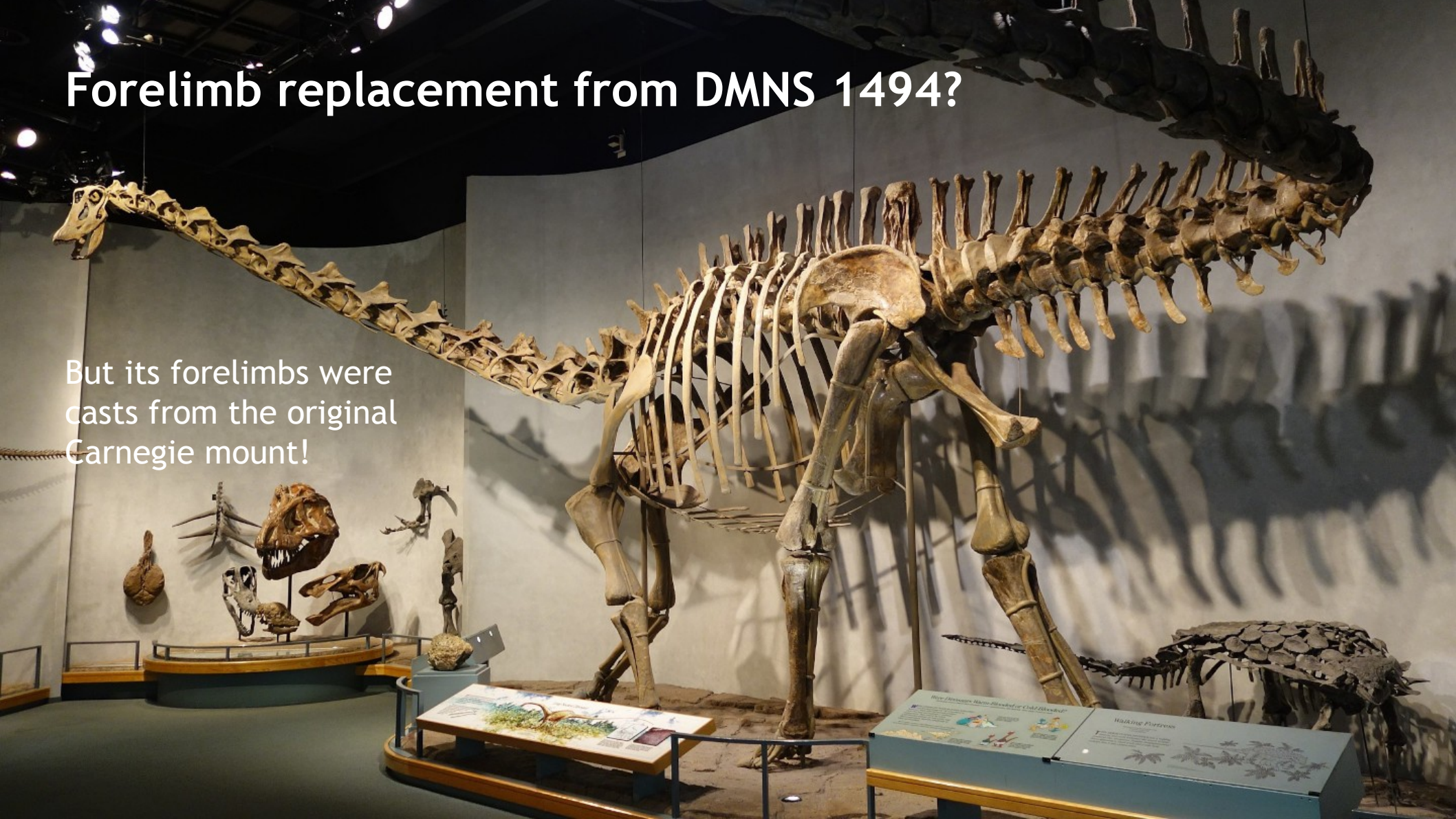
# Forelimb replacement from DMNS 1494?





# Forelimb replacement from DMNS 1494?

But its forelimbs were  
casts from the original  
Carnegie mount!





# Forelimb replacement 2007

BYU 681 scaled sculptures



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**Molds unused since  
1930 or even 1910.**



## Episode IV: A New Hope

In 1952,  
Carnegie curator  
LeRoy “Pop” Kay  
donated the molds  
to the Field House  
in Vernal.



# Untermanns

Ernest Untermann,  
Museum Director.

— and —

Billie Untermann,  
Staff Scientist.





# Assembling the concrete cast

Ernest

Billie





# Assembling the concrete cast





Cultural  
icon of  
Utah

1957-89



# Dippy Draws 'Dudes' by 'Thousands, Boosts Tourist Travel to Museum

G. Ernest Undermann,  
*Vernal Express*  
19 December 1957.



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Without benefit of seductive curves or a “come hither look”, “Dippy” the 76 foot long skeleton of the dinosaur *Diplodocus*, standing out on the lawn on the Utah Field House of Natural History, dazzles and delights the tourists, known to the trade as “dudes”.

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As a motorist pulls up to the curb, father hardly has time to set the brake, before the entire family erupts from the car and dashes across the lawn to charge Dippy amid gleeful squeals.

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Dippy is the most photographed object on U.S. Highway No. 40, between Salt Lake City and Denver. Although he was “born” only six months ago he had already been photographed thousands of times and has been the subject of as many as seven different camera fans at one time.

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# 1960s: what next for the molds?

Inquiries from various countries



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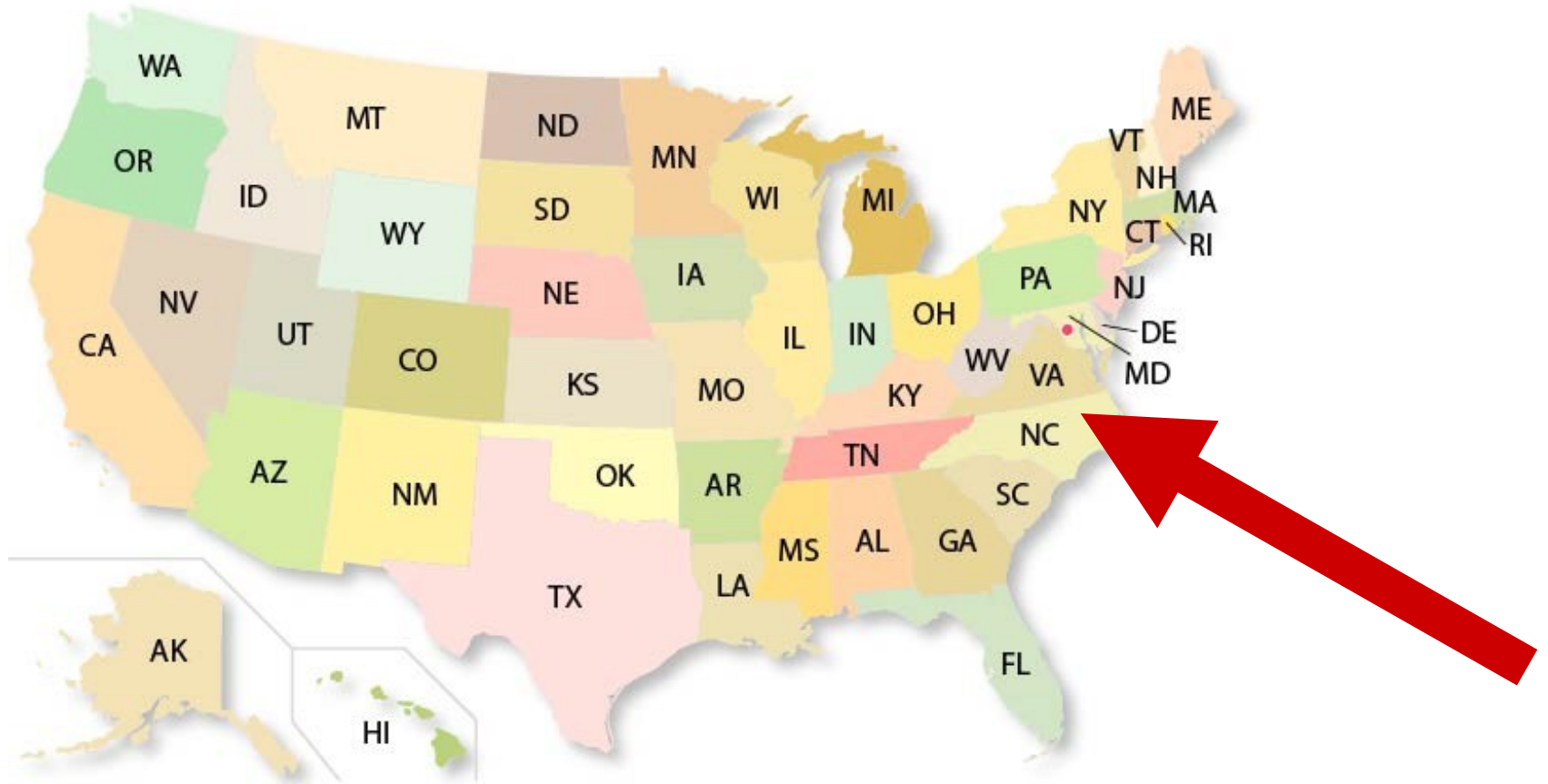


# 1960s: what next for the molds?

Inquiries from various countries



Shipped to Rocky Mount, NC.





Shipped to Rocky Mount, NC.



## What next for the molds?

**Q. What happened to the giant concrete dinosaur project at Sunset Park? — E.E.A.**

**A.** There is no positive answer concerning the future of this project. The project was originally announced in 1959 when Harold Minges, then a director of the Children's Museum, took it as a personal project.

He got the many molds necessary to construct the bone structure of the dinosaur from Utah where a copy of the dinosaur had been built. The molds were trucked back to Rocky Mount where they were stored. They are still on loan.

Minges said, "The project was delayed for several years for one reason or another. The molds now are stored in the old Avalon Airport building on NC 97 East. We expect to resume work on the project in the spring."



# An ignominious fate for the molds

Peter H. Laraba, Curator  
Utah Field House of Natural History State Park  
235 East Main  
Vernal, Utah 84078

Dear Mr. Laraba :

In responce to your letter of August 21, 1985 I have gather all the information possible on the Diplodocus molds. Unfortunately we do not have the molds nor do I know where they went after they left the Children's Museum. I also want to apologize for the time this response has taken to get to you. I am the "New" Director here just having started three weeks ago so please understand the delay.

# 1989: concrete cast crumbling

The Vernal climate ranges from  
-40°F to 100°F (-40°C to 38°C).

By the late 1980s it was coming apart.





# Episode VI: The Return of the *Diplodocus*

In 1989, new molds were made from the concrete cast.



## AGREEMENT

THIS AGREEMENT, is entered into effective June 30, 1989, by and between DINOLAB, INC., a Utah corporation [hereinafter referred to as "DINOLAB"], THE STATE OF UTAH, by and through the UTAH FIELD HOUSE OF NATURAL HISTORY STATE PARK [hereinafter referred to as "the State"], and THE CARNEGIE MUSEUM OF NATURAL HISTORY [hereinafter referred to as "The Carnegie"].

## RECTALS

The Carnegie originally authorized 11 replicas (10 plaster and 1 concrete) of a Diplodocus skeleton (the original skeleton remains in The Carnegie's possession), one of which is now owned by the State. The State's replica is now in need of repair but The Carnegie no longer has the molds. DINOLAB has agreed to undertake to repair the State's concrete replica and to make an

## 1994: Lightweight cast at the old Field House, Vernal





## 1994: Lightweight cast at the old Field House, Vernal





2004: Lightweight cast moved to the new Field House





## Other second-generation casts

These now inhabit  
Japan (five copies)  
Canada,  
and several locations  
in Florida.



# What happened to the concrete cast?

Ten years in collections  
at the Prehistoric Museum  
in Price, Utah.





# What happened to the concrete cast?

Currently on exhibition at the Prehistoric Museum in Price, Utah



... and finally ...

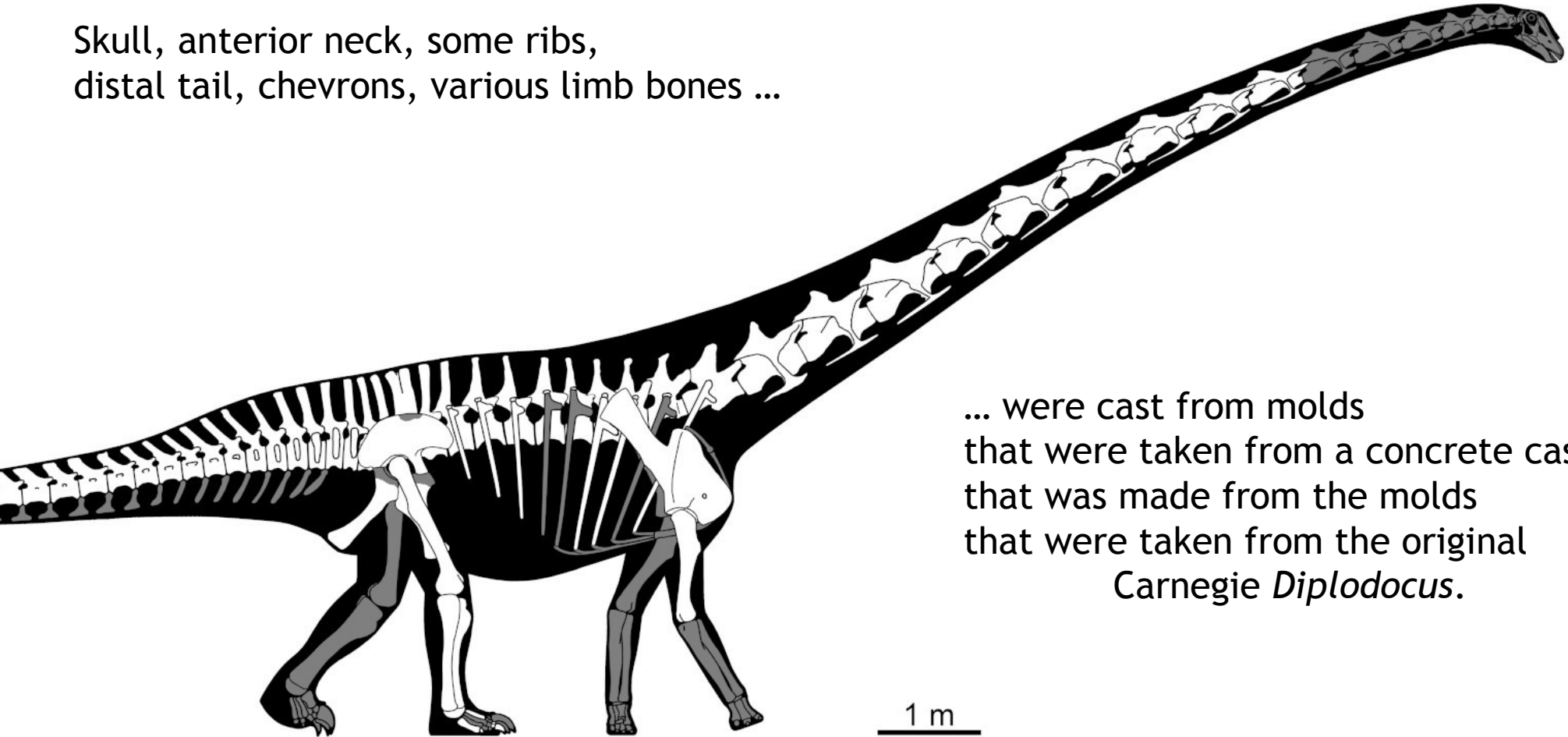
Elements cast from these molds are used  
in other mounts





# The AMNH's rearing *Barosaurus*

Skull, anterior neck, some ribs,  
distal tail, chevrons, various limb bones ...



... were cast from molds  
that were taken from a concrete cast  
that was made from the molds  
that were taken from the original  
*Carnegie Diplodocus*.

# For much, much, much more information ...

Taylor, Michael P., Amy C. Henrici, Linsly J. Church, Ilja Nieuwland and Matthew C. Lamanna. In prep. The history and composition of the Carnegie *Diplodocus*. Manuscript and illustrations at <https://github.com/MikeTaylor/palaeo-carnegie>

Taylor, Michael P., Steven D. Sroka and Kenneth Carpenter. 2023. The Concrete *Diplodocus* of Vernal — a Cultural Icon of Utah. *Geology of the Intermountain West* 10:65-91. doi:[10.31711/giw.v10.pp65-91](https://doi.org/10.31711/giw.v10.pp65-91)

The skeletal reconstruction of *Barosaurus lentus* in the American Museum of Natural History. In prep. Taylor, Michael P., Peter May, Lowell Dingus, Eugene S. Gaffney, Mark A. Norell and John S. McIntosh†. Manuscript and illustrations at <https://github.com/MikeTaylor/palaeo-baromount>



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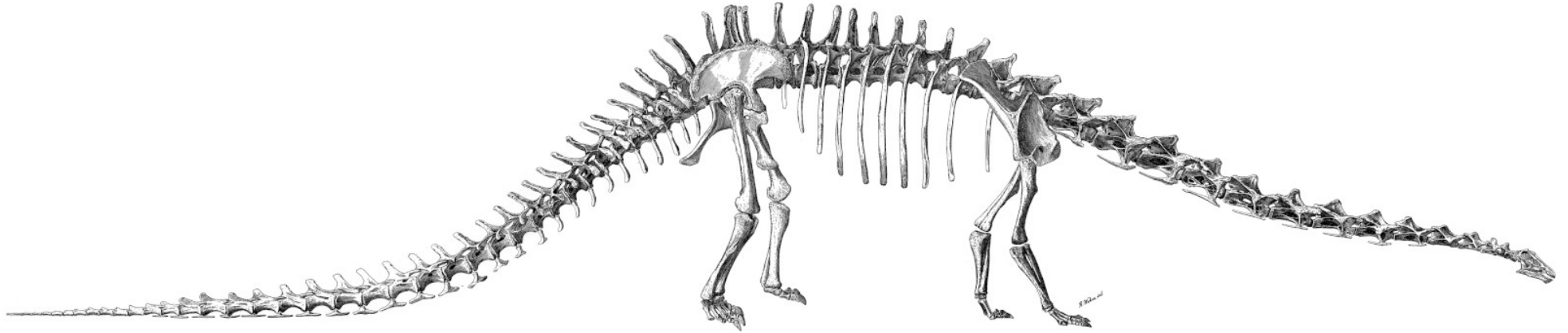






# Total length of the mounted skeleton

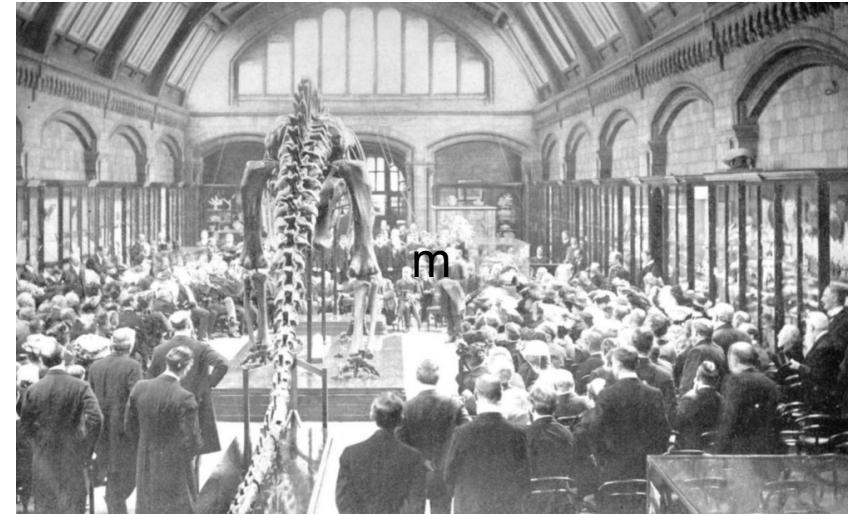
Source	Length (feet)	Length (m)	Comments
Hatcher (1901)	68 feet	20.7 m	Tip of snout to caudal 37





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Holland (1904a)	78-80 feet	21.3-24.4 m	London mount, predicted
Holland (1904b)	84-85 feet	25.6-25.9 m	London mount
Holland (1904b)	78-80 feet	21.3-24.4 m	London mount
Holland (1905)	84 feet	25.6 m	London mount
Holland (1907)	78.5 feet	23.94 m	Berlin mount.



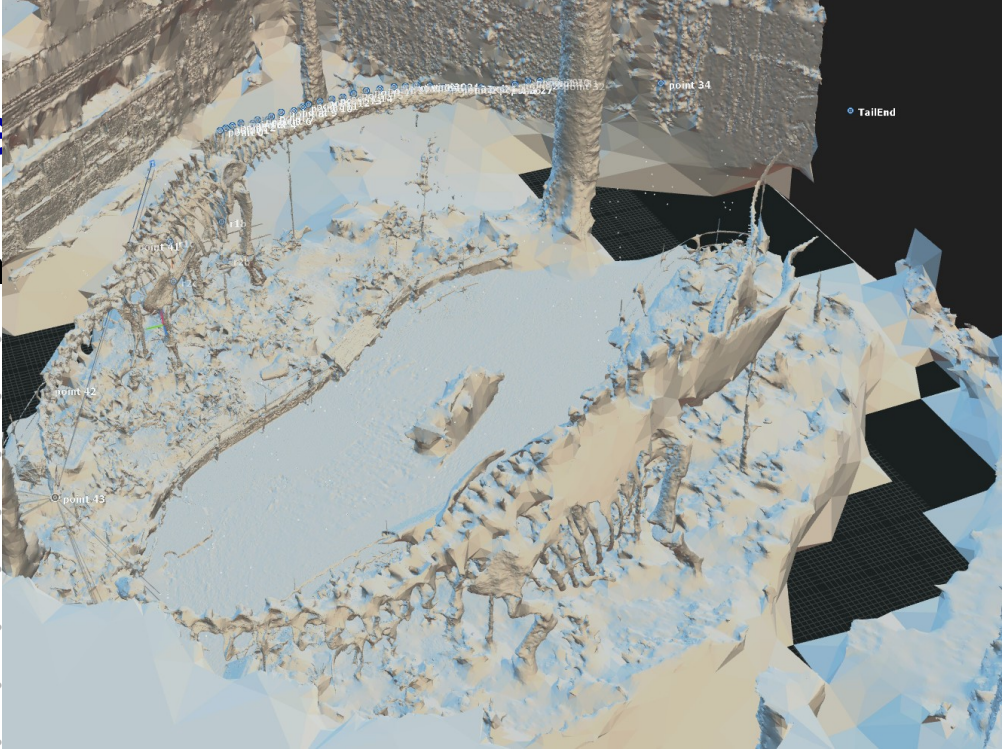
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Holland (1907)	78.5 feet	23.94 m	Berlin mount.
Untermann (1959)	76 feet	23.2 m	Vernal mount
David Letasi (p.c.)	75 feet	22.9 m	Lehi elements, laid out
Vincent Reneleau (p.c.)	77 feet	23.5 m	Distance along floor



# Total length of the mounted skeleton

Source	Length (feet)	Length (m)	
Hatcher (1901)	68 feet	20.72 m	
Holland (1904a)	78-80 feet	21.30-23.77 m	
Holland (1904b)	84-85 feet	25.60-25.91 m	
Holland (1904b)	78-80 feet	21.30-23.77 m	
Holland (1905)	84 feet	25.60 m	
Holland (1907)	78.5 feet	23.93 m	
Untermann (1959)	76 feet	23.17 m	
David Letasi (p.c.)	75 feet	22.86 m	
Vincent Reneleau (p.c.)	77 feet	23.5 m	Distance along floor
Falkingham Photogram.	85.5 feet	26.05 m	Current Carnegie mount



# Total length of the

## Source

- Hatcher (1901)
- Holland (1904a)
- Holland (1904b)
- Holland (1904b)
- Holland (1905)
- Holland (1907)
- Untermann (1959)
- David Letasi (p.c.)
- Vincent Reneleau (p.c.)
- Falkingham Photogram.
- Eye-Bot LIDAR

Le	68		
	78		
	84		
	78		
	84		
	78		
	76		
	75		
	77 feet	25.5 m	Distance along floor
	85.5 feet	26.05 m	Current Carnegie mount
	85 feet, 9 in	26.13 m	Current Carnegie mount



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Falkingham Photogram.	85.5 feet	26.05 m	Current Carnegie mount
Eye-Bot LIDAR	85 feet, 9 in	26.13 m	Current Carnegie mount

Consensus: old mount about 23 m, new mount 26 m.