



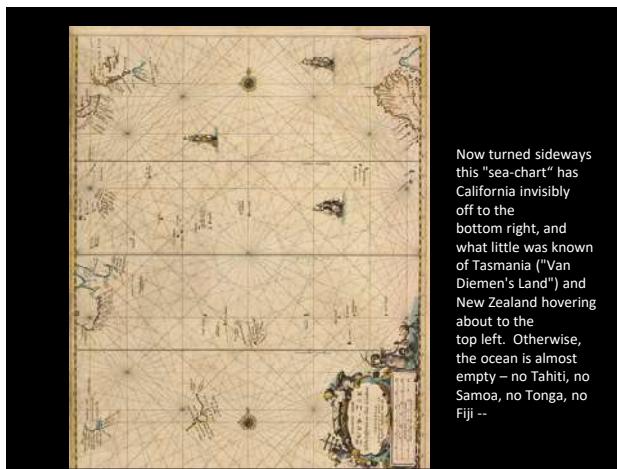
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This lovely map shows how little Europeans knew about the Pacific Ocean when James Cook first explored there in the 18th century. Engraved by Pieter Goos for his book *De zee-atlas ofte water-wereld* (Amsterdam, 1667).

Actually, to make sense of this map, you have to turn it sideways!

2



Now turned sideways this "sea-chart" has California invisibly off to the bottom right, and what little was known of Tasmania ("Van Diemen's Land") and New Zealand hovering about to the top left. Otherwise, the ocean is almost empty – no Tahiti, no Samoa, no Tonga, no Fiji --

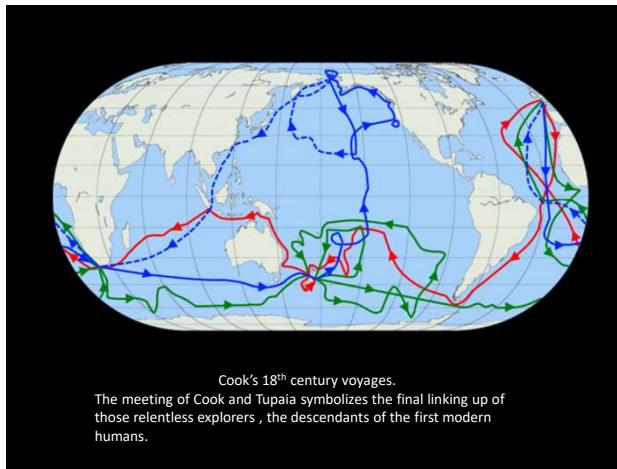
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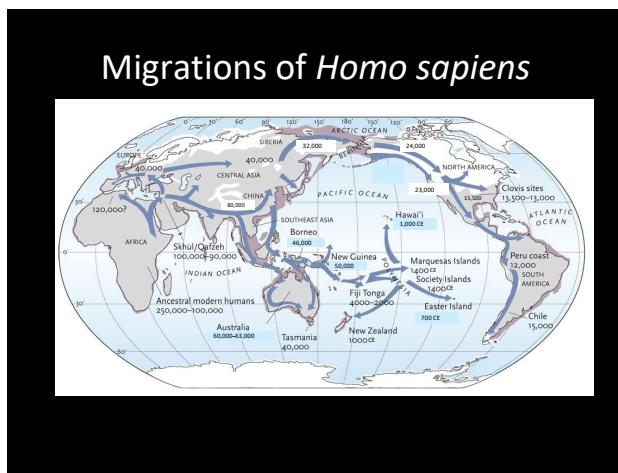
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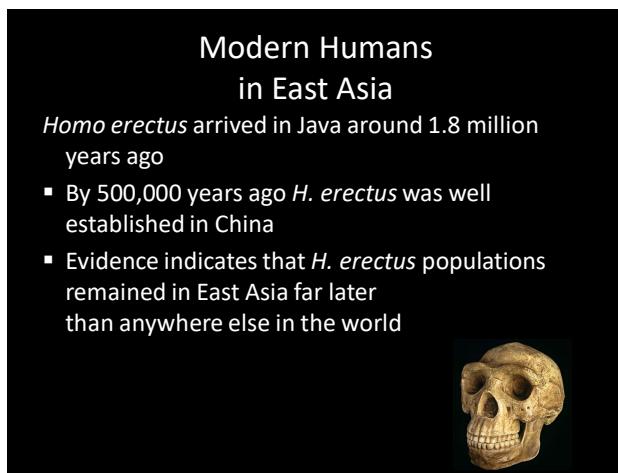
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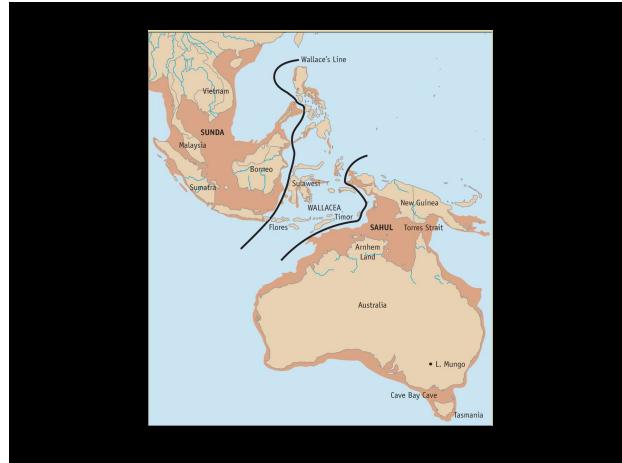
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Glacial Period Geography in Australia & Asia

During periods of glacial advance and low sea level, new landmasses emerged:

- Sahul – landmass linking Australia, Tasmania, and New Guinea
 - Sunda – landmass connecting much of southeast Asia
- Wallacea — string of islands separating Sahul and Sunda
- Wallace Line — runs through Wallacea, separates the unique flora and fauna of Australia from Asia

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The Peopling of Australia

Humans had to cross the Wallace Line by sea to get to Australia

- There is no evidence for Asian mammals or *Homo erectus* in Australia
- Two possible routes for modern humans crossing Wallacea into Sahul — both require sea voyages:
 - The northern route is indirect; requires sea voyages greater than 10 km
 - The southern route is more direct; requires a sea voyage of about 90 km

Human Migration to Australia

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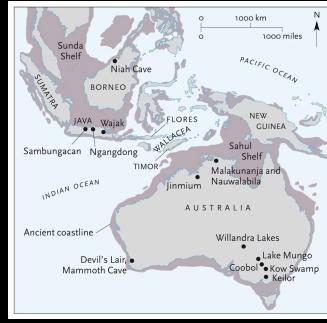
Earliest Human Occupation of Australia

- Earliest evidence for human occupation found at Nauwalabila I — dated to between 53,000 and 60,000 years ago
 - Deeper levels exist but attempts to 14C date them have been unsuccessful
- Initial occupation of Lake Mungo dates to 50,000 to 40,000 years ago
- Scant evidence for human occupation before 60,000 years ago
 - Junmium Cave site dated to 116,000 years ago —dates not widely accepted

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Lake Mungo, one of a series of dried out lakes in S. Australia, yielded two human burials and stone tools (simple flakes and cores. The sediments are dated to 40,000 BP; the tools to 46,000-50,000 BP.

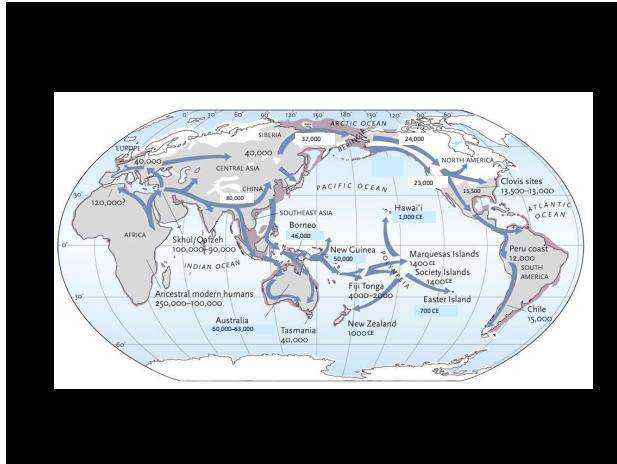


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Australian Megafauna Extinction

- Widespread extinction of megafauna occurred globally at the end of the Pleistocene Ice Age
- Australian megafauna appear to have gone extinct 50,000-40,000 years ago
 - 23 of 24 genera of Australian land animals with body weights over 45 kg went extinct at the end of the Pleistocene
 - Megafauna went extinct 10,000-15,000 years after arrival of 1st humans
 - Little evidence that 1st Australians hunted large game or had well-developed hunting toolkits

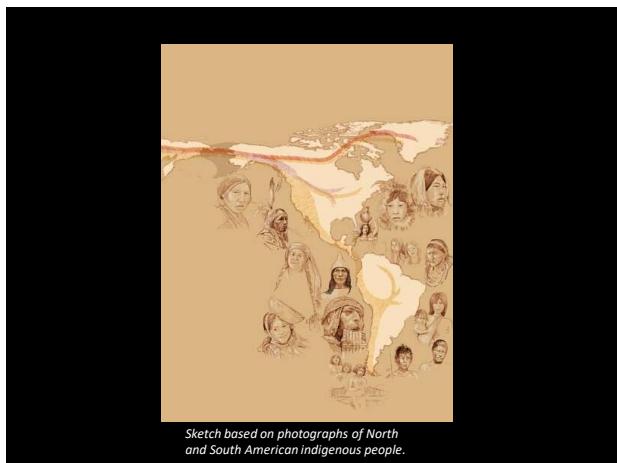
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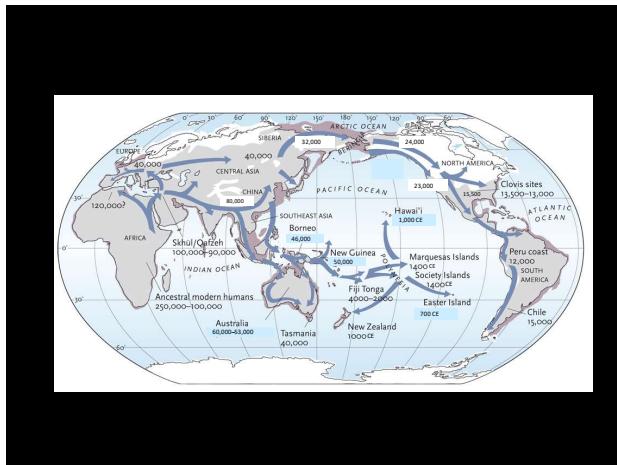
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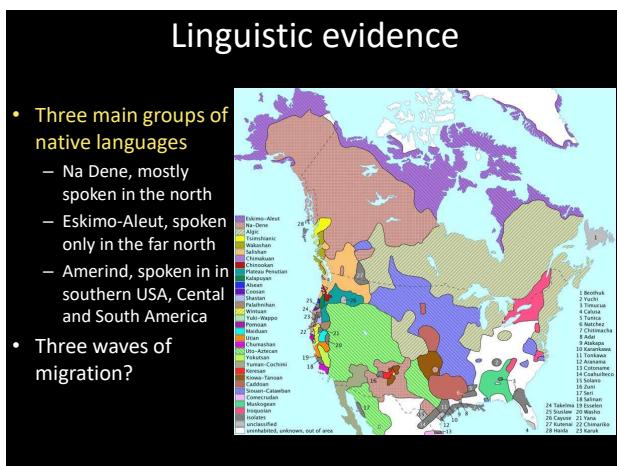
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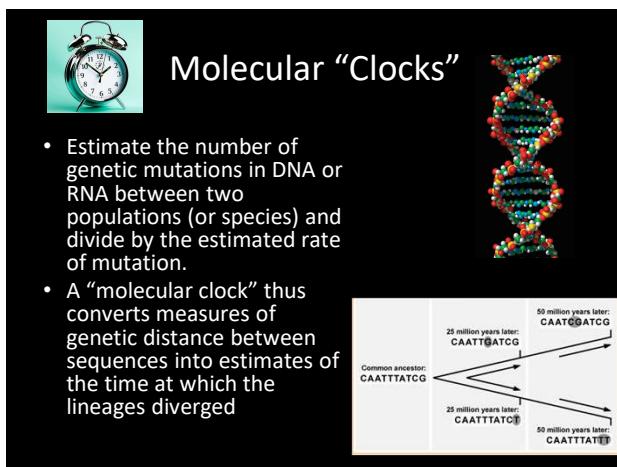
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Contributions of aDNA evidence

- The ability to sequence genomes from ancient bones has increased dramatically.
- Ancient DNA (aDNA) studies now have large sample sizes and render detailed information bearing on the (pre)history of human migrations.



A human petrous bone being analyzed at the Max Planck Institute for the Science of Human History in Jena, Germany.

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Eske Willerslev, a geneticist from Denmark, with members of the Fallon Paiute-Shoshone tribe in Nevada. With permission from the tribe, Willerslev was able to retrieve DNA from a tooth belonging to a man buried 11,000 years ago in Nevada's Spirit Cave.

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- An illustration of ancient Native Americans in what is today called the Upward Sun River site in central Alaska. The 11,500-year-old skeleton of an infant girl found there offers genetic clues to how people arrived in the Americas.
- The girl was just six weeks old when she died. Her body was buried on a bed of antler points and red ochre, and she lay undisturbed for 11,500 years.
- Archaeologists discovered her in an ancient burial pit in Alaska in 2010.
- Her genome has been retrieved.

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Genetic evidence

- Limited genetic variability in native North and South America:
 - 5 main haplotypes; relatively little difference overall.
- In 2014 DNA was sequenced from the skeleton of another child, this one buried at Anzick, Montana, 12600 BP. The result is a full Paleo-American genome.
- Without question, Paleo-Americans are the ancestors of today's First Nations.

Each colored tile represents an indigenous haplotype; there are five main types.

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Recent genetic evidence supports the linguistics

- Genetic research shows that there were three migrations.
- The first one, before 15000 BP, was followed by two others.
- The 2nd and 3rd waves mixed in with the 1st wave.
- Inuit people inherit about half of their DNA from the people of the first migration and half from a second migration.
- The Chipewyans of Canada, who speak a Na-Dene language, have 90% of their genes from the first migration and some 10% from a third.

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Archaeological Evidence

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Peopling of the New World

There are three models for the peopling of the Americas:

1. Clovis First: supporters of this model believe that people using Clovis-type stone tools (13,500-12,500 years ago) were the first to live in the Americas
2. Pre-Clovis: holds that human occupation of the Americas happened before 13,500 years ago
3. Early Arrival: states that humans were present in the New World by 30,000 years ago

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Clovis First Model

Clovis culture, dated to 13,500 to 12,500 BP, is defined largely on the presence of Clovis spear points found across North America



Clovis points from Arizona

No Longer Supported

- Supporters believed humans crossed the Bering land bridge into North America, were funneled down from Alaska to the Great Plains by an ice-free corridor, and hunted all the megafauna in the New World to extinction in about 1000 years
- Archaeological data shows that people were in North America during the Clovis period; however, no evidence clearly supports the Clovis First model

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Pre-Clovis Model

Many claims have been made for Pre-Clovis sites in the New World

- including Bluefish Caves, Yukon (24,000 BP); White Sands, Nevada (23,000 BP); Deborah L. Friedkin Site, Texas (16,170 BP); Meadowcroft Rockshelter, Pennsylvania (23,000-15,000 BP); and Monte Verde, Chile (15,000 BP)
- Other sites indicate that Clovis was simply one of several regional traditions
 - Including Pedra Pintada, Brazil (13,000-11,000 B.P.) and Quebrada Tacaúay, Peru (12,700-12,500 B.P.)
- Pre-Clovis peoples thought to have been coastally adapted—they moved out of Beringia following the West Coast

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Migration Routes to the Americas

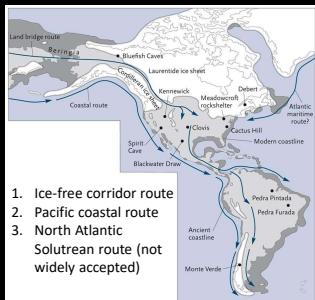
Debates surround how peoples migrated into the New world.

The possibilities include:

- Beringia—land bridge that connected Asia and North America during times of low sea level
- Ice-free corridor—a potential (if viable) migration route running between ice sheets for people emerging from Beringia
- Coastal migration—humans migrated into the Americas along the West Coast

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Routes to the Americas



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Where is the Old World closest to the New World?
The proximity of Siberia and Alaska is hard to miss.

36



35,000 years ago, horses, mammoths and other prey animals were abundant in Siberia, attracting humans and other carnivores. The climate deteriorated. Hemmed in by worse conditions, the humans, some of them the ancestors of Native Americans, were isolated for thousands of years. So were wolves. It is there and then, around 23,000 BP, that dogs were first domesticated, according to a new hypothesis from a group of archaeologists and ancient DNA experts.

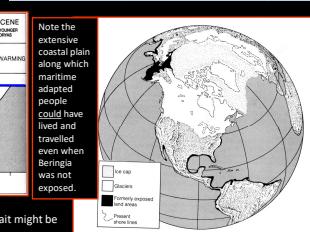
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Beringia

Pleistocene continental glaciers "locked up" huge amounts of water. This caused a net drop in the ocean level, exposing coastal regions.

At least twice during the late Pleistocene, ocean levels dropped sufficiently to expose a "land bridge" (Beringia) between Asia and N. America.

This huge area of steppe grasslands attracted megafauna, and may have enabled human migration eastward into the Americas.



The existence of Beringia need not be a pre-condition for humans to reach the Americas. Crossing the Bering Strait might be accomplished over sea ice, or in comparatively small boats.

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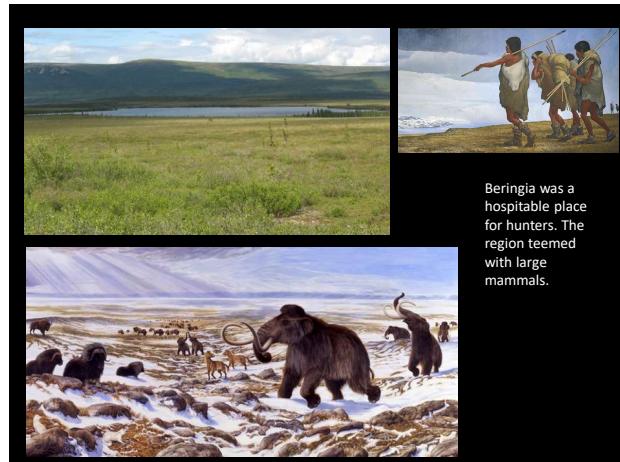
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Beringian archaeology



Excavation of a site occupied in Beringia 32,000 years ago.
V. V. Pitul'ko & E. Yu. Pavlova

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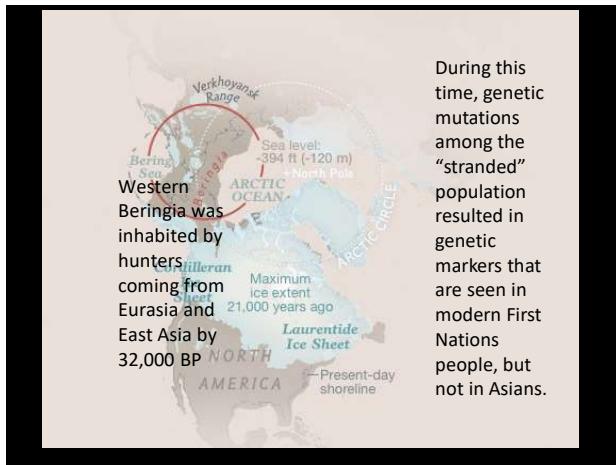


Beringia was a hospitable place for hunters. The region teemed with large mammals.

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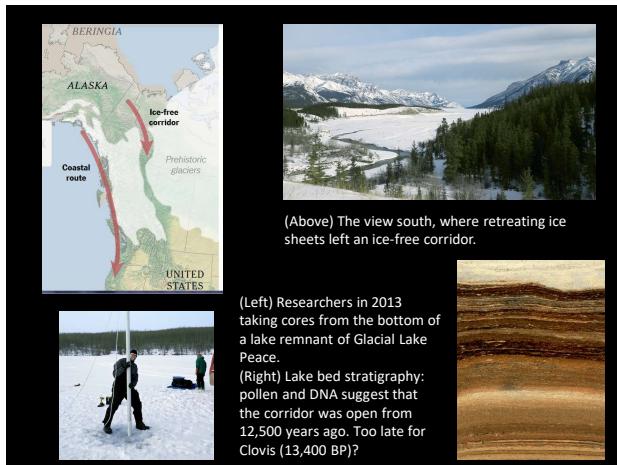
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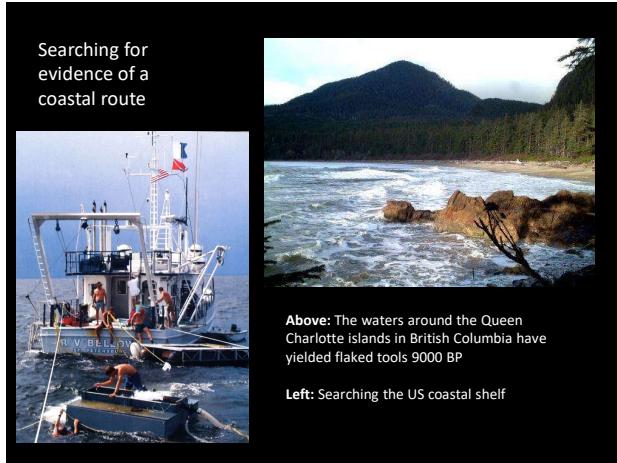
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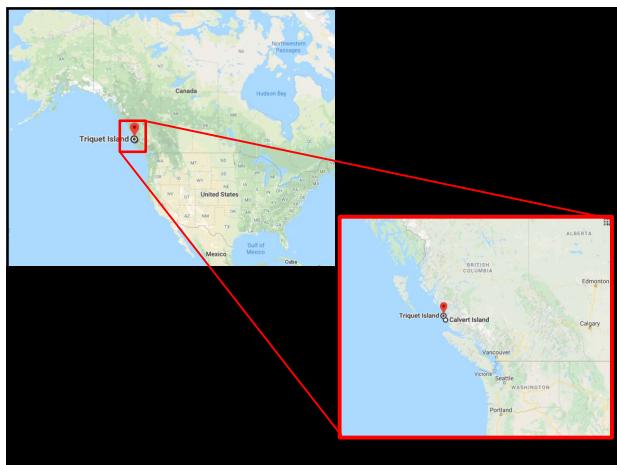
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In 2015 archaeologists excavating a midden site on the shoreline of Calvert Island (north of Vancouver, British Columbia) found impressions in the grey clay. They turned out to be footprints --- 12 of them --- all near a stone-lined hearth. A tiny piece of charcoal found in the first footprint yielded a radiocarbon date of 13,200 years ago.

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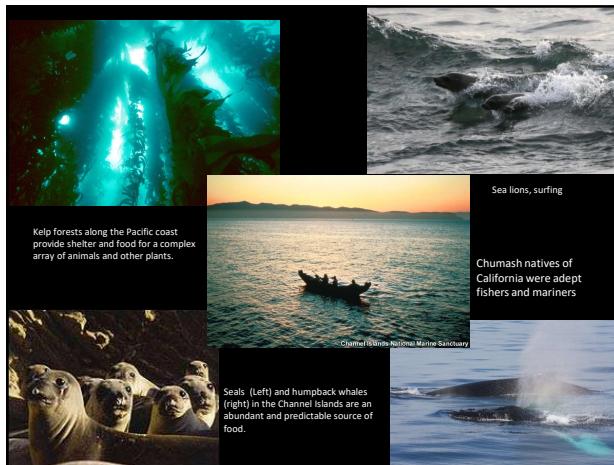
Triquet Island, BC

- In 2017, Alisha Gavreau, a PhD student at the University of Victoria, discovered the remains of a village on an island off the British Columbia coast.
- The settlement dates to 14,000 BP.
- It confirms a First Nations oral tradition concerning the establishment of coastal villages during an ice age, where ancestors survived and thrived.



Digging beneath a couple of meters of peat, Gavreau and her team found a hearth and, near it, fish hooks, a hand drill for igniting fires, a wooden device for launching projectiles (atlatl) and a cache of stone tools.

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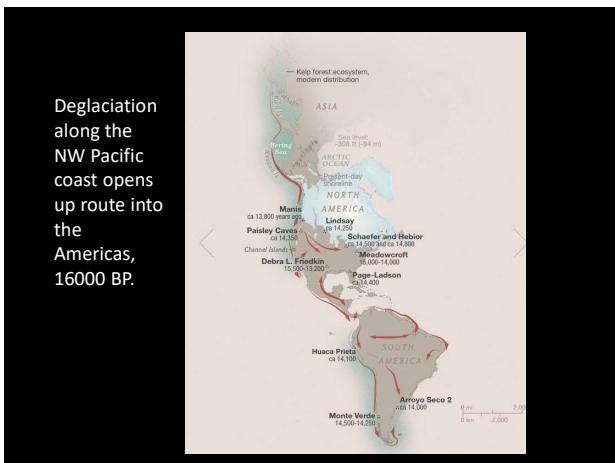
Evidence from Daisy Cave, San Miguel Island, California



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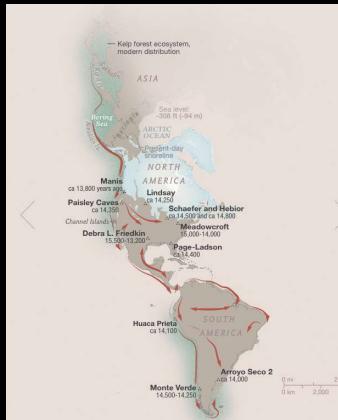


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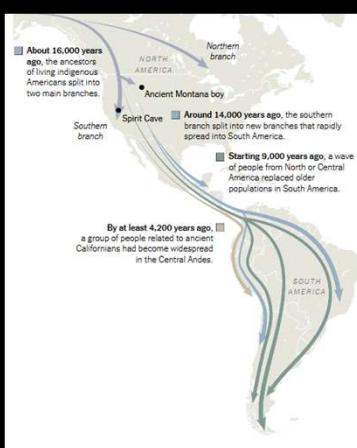


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Once out of Beringia, hunters spread rapidly. They reached the tip of South America in only a few hundred years.



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Between 14000 – 13000 BP, an ice-free corridor opened up, allowing even more movement into and across the continent.

Around 12000 BP there was a reversal, northward movement, as hunters followed big game. When the boreal forest colonized the corridor it became less attractive.



57

Because of their age, early sites are often compromised by site transformation and biological degradation.

However, Meadowcroft Rock Shelter (NW Pennsylvania) is a well-excavated site dating to about 13,000-14,000 BP

It did NOT yield artifacts similar to Clovis points...

Plant and animal remains suggest an economy that did not focus upon mega-fauna prey species.

Confoundingly, though, it is argued that the bottom-most deposits at Meadowcroft suggest it was set in a diverse environment more like that of mid-Holocene, rather than the Pleistocene!



Complex stratigraphic sequence at Meadowcroft. The site was initially challenged by critics who proposed that the early dates might reflect groundwater contamination of the dated materials.

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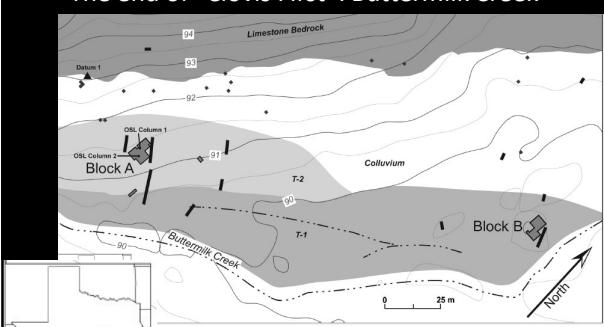
The Paisley Caves, Oregon, overlook a prehistoric lakebed. In 2002 a team discovered fragments of prehistoric life: camel and horse bones, sage grouse, mountain sheep and antelope bones with cut marks on them, tiny fragments of sewing thread, a handful of what looked like stone tools and more than a dozen oval, dried-up feces ("coprolites").

Human DNA was extracted from coprolites found at Paisley Cave 5; they date to 14,300 BP.

This is about 1000 years older than Clovis. Since the ice-free corridor was closed at that time, the Paisley Caves evidence strongly suggests a maritime route for early New World colonists.

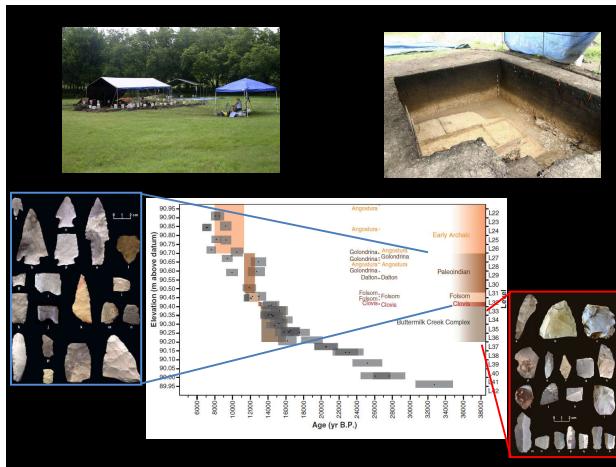
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The end of "Clovis First": Buttermilk Creek

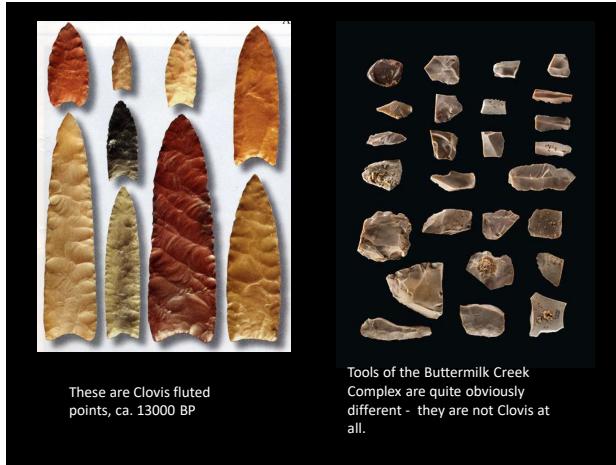


Location of the Deborah L. Friedkin Site, Texas., and positions of trenches.

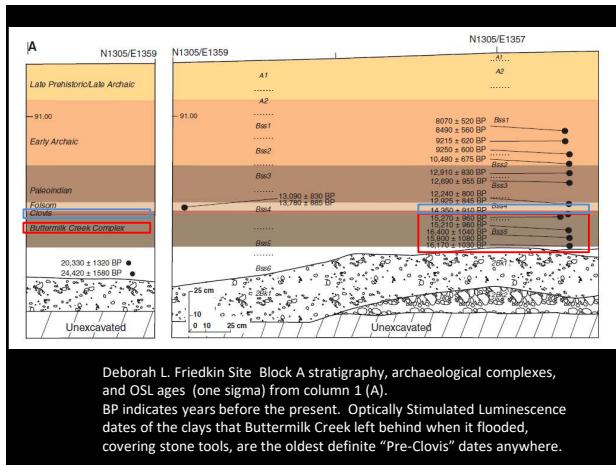
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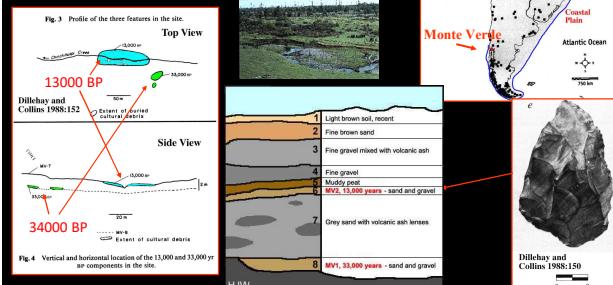
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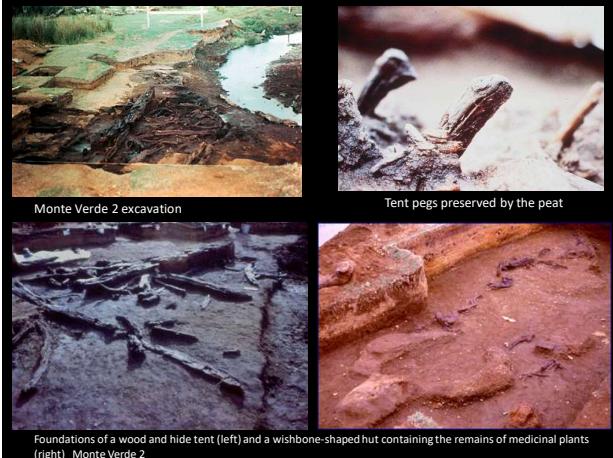
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Monte Verde, Chile.

• This open site was located along a stream edge on the now submerged narrow coastal plain that extended down the west coast of South America. Two occupations, one early the other very early, are claimed.
 • Monte Verde yielded bone, stone, wood artifacts, plus building foundations, plant remains, and hearths.
 • The 13,000 BP deposits are widely accepted. The excavators are less certain about the cultural materials recovered from the 34,000 BP deposits.



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The New York Times

Ancient Footprints Push Back Human Arrival in the Americas

Human footprints found in New Mexico are about old, a study reported, suggesting that people may have long before the Ice Age's glaciers melted.

High Country News

ARCHAEOLOGY

The White Sands discovery only confirms what Indigenous people have said all along

Once again, the media has excluded Indigenous peoples from our own story.

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Whose past is it?

Nick Martin, writing in the *High Country News*, Oct. 13, 2021

...Anyone who read only mainstream coverage would walk away without a clue that this is actually an Indigenous story, not merely a triumphant discovery of capital-s Science. Not a single Indigenous citizen, historian, elder, story-holder, biologist, geneticist or archaeologist was quoted in the piece, nor did the word "Indigenous" or "Native" appear once....

70

Whose past is it?

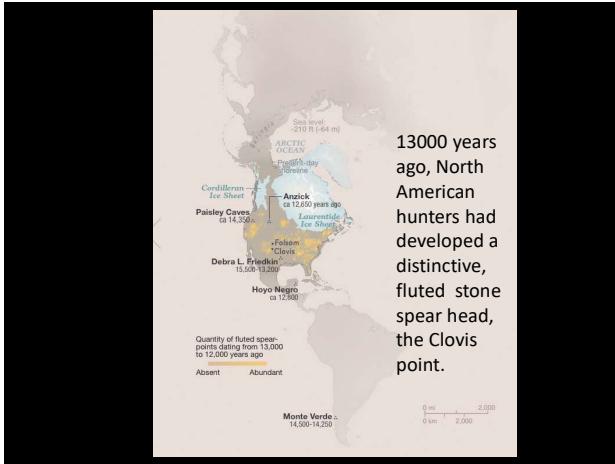
Nick Martin, writing in the *High Country News*, Oct. 13, 2021

....
This discovery and the knowledge accompanying it, you see, is entirely owned and framed by people who, in the grand scheme of history, have only known this land for a blink of time. Apparently, they can't help but regard the footprints they discovered, not as Indigenous, but merely as evidence.

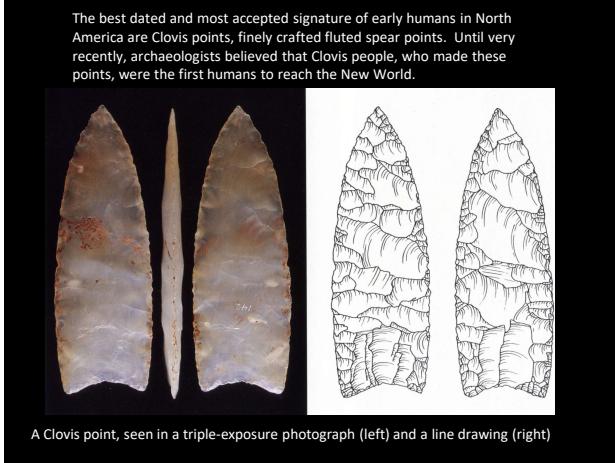
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Moving along in time...

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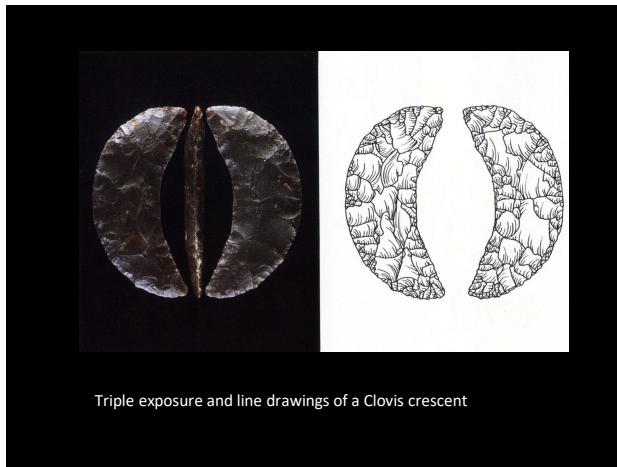
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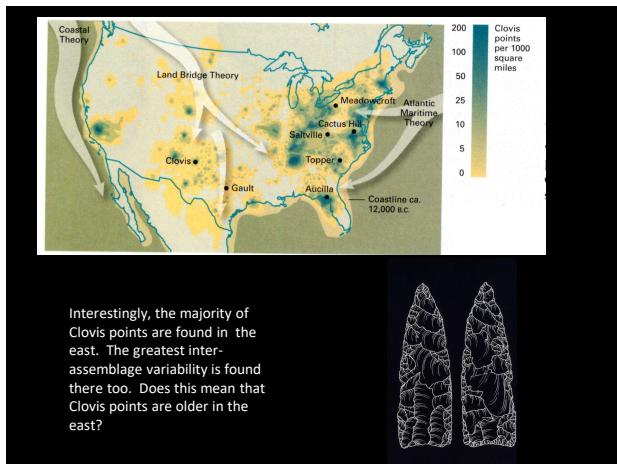


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Triple exposure and line drawings of a Clovis crescent

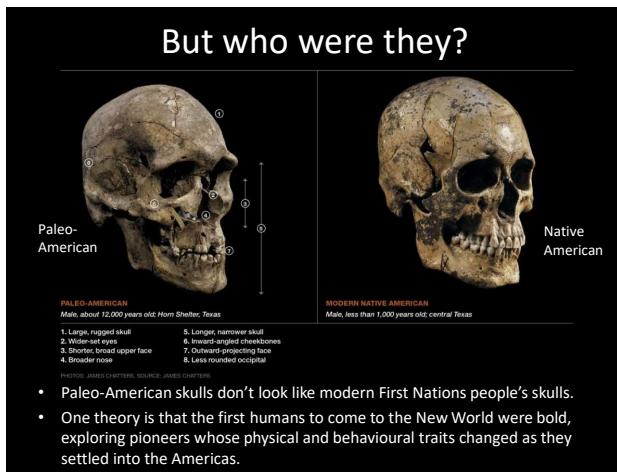
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Interestingly, the majority of Clovis points are found in the east. The greatest inter-assemblage variability is found there too. Does this mean that Clovis points are older in the east?



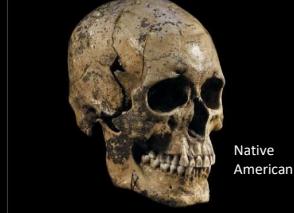
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But who were they?



PALeO-AMERICAN
Male, about 12,000 years old; Horn Shelter, Texas



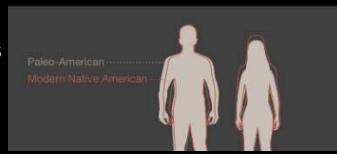
MODERN NATIVE AMERICAN
Male, less than 1,000 years old; central Texas

- Paleo-American skulls don't look like modern First Nations people's skulls.
- One theory is that the first humans to come to the New World were bold, exploring pioneers whose physical and behavioural traits changed as they settled into the Americas.

78

Traits of a pioneer population:

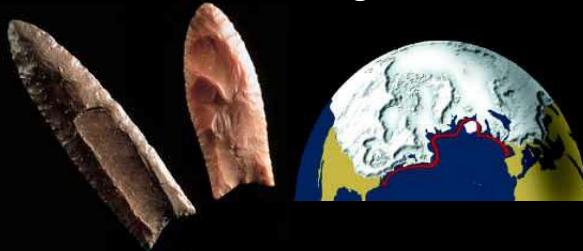
- Paleo-American skeletons show that males ate better food, grew larger, and lived much longer than females, who died by age 26.
- Today, modern First Nations men are smaller than Paleo-Americans, and women today are larger.



Reburial of the 12,600-year old Anzick child.

79

Solutrean immigrants?



• Dennis Stanford thinks that North American fluted points are technologically most similar to European tools of the Solutrean "culture" of the Upper Palaeolithic.

• He and Bruce Bradley argue that Solutrean hunters followed the edge of the North Atlantic ice pack to westwards to North America. The result was Clovis.

• Few other archaeologists agree.

80

Not-Clovis and Pre-Clovis



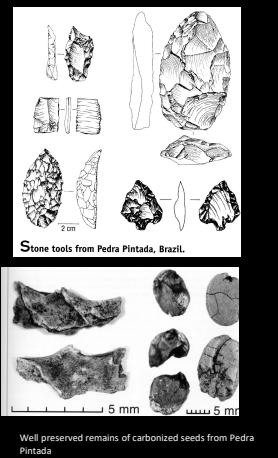
Dillehay and Collins 1988:150



81

- **Pedra Pintada, Brazil.**

- Lower Amazon cave with 2.25 m of deposits; basal dates 13,000-11,000 BP
- Stone tools are non-Clovis, with triangular bifacial points and many flake tools.
- Abundant plant food remains.



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Early Arrival Model

Holds that human occupation of the Americas took place before the later stages of the last period of glacial advance

- Early arrival proponents place the arrival of the 1st humans as early as 50,000 B.P.
- Sites that appear to support early arrival are found in North and South America and widely contested
 - They include Old Crow Basin, Canada (40,000-30,000 B.P.), Monte Verde, Chile (33,000 B.P.), and Pedra Furada, Brazil (48,000-35,000 B.P.)
- Early arrival model supporters are the minority in the archaeological community

83

-
- In 2015, Reich and colleagues found that some living people in the Amazon carry some DNA that's most similar to that of people who live today in Australia and New Guinea.
 - The researchers speculated that their ancestry included an unknown group, which the scientists called Population Y, who separately made their way into the Americas.
 - Now, traces of Population Y have been identified in some 10,000-year old skeletons in Brazil.

Excavation of a skeleton approximately 9,600 years old in a rock shelter in Brazil.

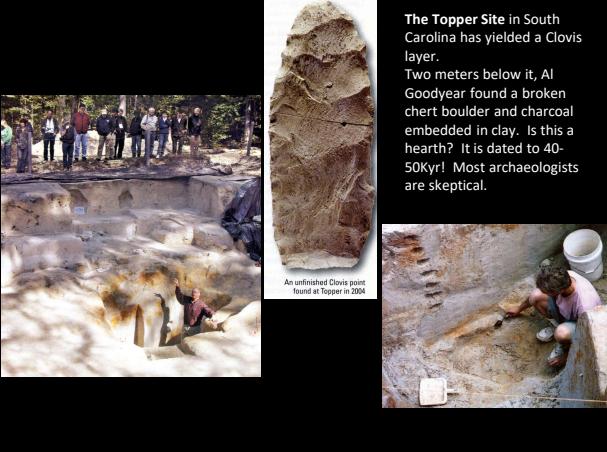
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- What happened?
- Perhaps another group of Asians entered the Americas long before the ancestors of other early Native Americans. Maybe they interbred with people in the Amazon before disappearing altogether.
- Or perhaps a few of the early members of the southern branch happened to have some odd genes that survived through the generations....

Excavation of a skeleton approximately 9,600 years old in a rock shelter in Brazil. Stayed tuned!

85



The Topper Site in South Carolina has yielded a Clovis layer. Two meters below it, Al Goodyear found a broken chert boulder and charcoal embedded in clay. Is this a hearth? It is dated to 40-50Kyr! Most archaeologists are skeptical.

86



The Paleoindian Period, ca. 11,200-8,000 BCE
A selection of Clovis points

87

New World Megafauna Extinction

Widespread extinction of megafauna occurred globally at the end of the Pleistocene Ice Age

New World megafauna appears to have gone extinct 13,250-12,900 years ago

- 17 genera of North and South American megafauna went extinct including mastodons, mammoths, horses, and camels

Megafauna went extinct at the time the first Clovis sites were formed

- Many archaeologists doubt whether overhunting was the cause of megafauna extinction in the Americas

88

Early American Hunters

Unlike in Australia, the first Americans are known to have hunted big game

- First Americans hunted megafauna; however, all data indicates that they did so 1 or 2 at a time — not enough to drive them to extinction

Some question whether Clovis hunters specialized exclusively on hunting big game

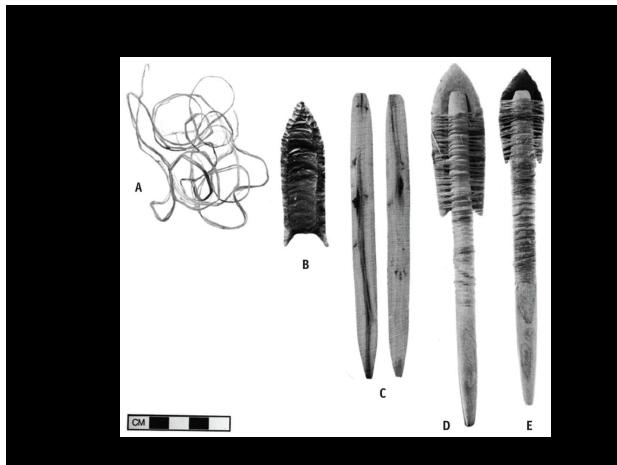
- A number of sites produced evidence of early humans in the Americas hunting smaller game

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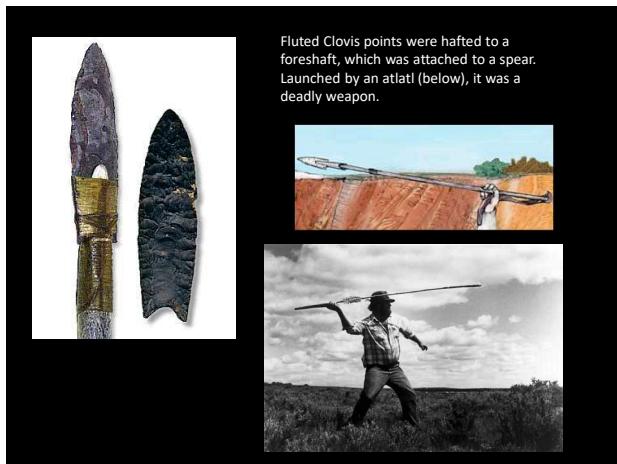
Clovis points were the elegant, deadly tips of thrusting spears used to kill mammoth and other megafauna.



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92

Early American Hunters

Periods after Clovis are known for massive kill sites

- At the Olsen-Chubbuck site, Colorado, remains of a massive bison kill from about 10,000 years ago were found
 - Hunters had stampeded a herd into an arroyo killing almost 200 bison—they then butchered them

Interestingly, despite evidence for many giant bison kill sites over time, bison did not go extinct

Olsen-Chubbuck site, Colorado

93



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Megaфаuna extinction

CHARLOTTE PEVNY / CSFA

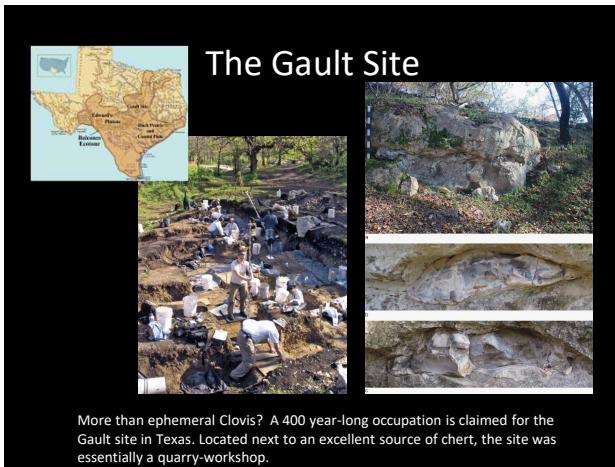
- 35 genera of mammals became extinct at the end of the Pleistocene, including mammoth, mastodon, ground sloth, horses, deer and their predators.
- Human overkill?

95

Lindenmeier

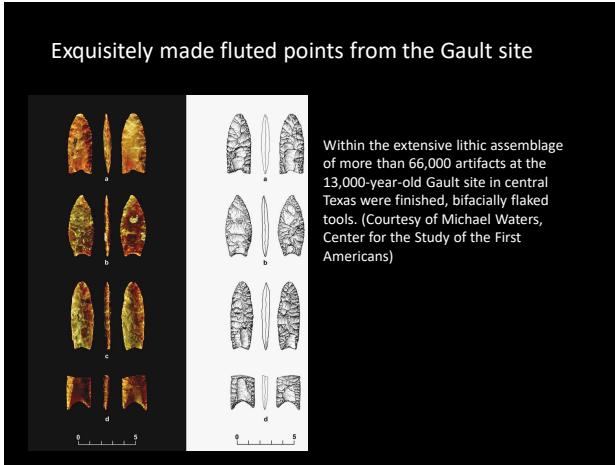
The Paleoindian site of Lindenmeier (northern Colorado) was excavated from 1934-1940. There, archaeologists found more than 50,000 stone artifacts and 15,000 animal bones. Obsidian artifacts in Area 1 came from New Mexico; obsidian artifacts in Area 2 came from Wyoming. An aggregation site?

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More than ephemeral Clovis? A 400 year-long occupation is claimed for the Gault site in Texas. Located next to an excellent source of chert, the site was essentially a quarry-workshop.

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Within the extensive lithic assemblage of more than 66,000 artifacts at the 13,000-year-old Gault site in central Texas were finished, bifacially flaked tools. (Courtesy of Michael Waters, Center for the Study of the First Americans)

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