EarthDate

We Changed Horses

Wild horses in the snowy Sar Mountains of southeastern Europe. Landscapes like these remind scientists of the steppe environments where humans first attempted to tame and ride horses, a process still debated and pieced together from archaeology and genetics.

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Horses changed human history. But first we had to change horses.

The horse evolved in North America 50 million years ago, and migrated across the Bering land bridge into Eurasia. Then, during the last Ice Age, it went extinct in the Americas.

Around 5,000 years ago, humans began taming horses in the Eurasian Steppe, in what is today Kazakhstan, Russia and Ukraine. There, archaeologists have found residue of mare's milk in drinking vessels. Some horse skeletons show wear on their teeth suggesting they held bits in their mouth.

But other skeletons have arrow points embedded in bones, suggesting that horses were hunted as much as domesticated. A thousand years later, a different steppe culture tamed a different horse and, evidence shows, developed a horse culture – so successfully that it replaced the earlier horses.

Genetic testing revealed that this first domesticated breed, called DOM2, became the progenitor of all later horse breeds. With them, humans could travel farther and faster than ever before. Mounted nomads could cover landscapes. Mounted cavalry could vanquish enemies. Horses could pull carts, and later, plows.

We hardly think about it today, but from 4,000 to just 100 years ago, horses were the driving force in human transportation, settlement and warfare. The only thing that moved more people was our own two feet.

I'm Scott Tinker.

SWITCH ENERGY ALLIANCE

Background: We Changed Horses

Synopsis: Horses played one of the most transformative roles in human history, yet they were domesticated later than many other animals. Exactly when and where this happened remains a puzzle and one that evolves as new evidence is unearthed.

Origins of the Horse

- Horses evolved in North America roughly 50 million years ago from a small, hoofed ancestor, Eohippus, or "dawn horse."
  - From North America, they migrated across the Bering Land Bridge into Eurasia.
  - During their development, several key traits emerged including:
    - Long legs for running on open grassland
    - High-crowned teeth for grazing on tough grasses
    - Herd behavior that improved survival
  - At the end of the most recent glacial period, approximately 10,000 years ago, horses went extinct in the America's but survived in Eurasia, where they would meet humans.
  - This evolutionary background set the stage for domestication.

A Paleolithic horse painting in Russia's Kapova Cave shows how humans admired and depicted horses thousands of years before they were ever domesticated.

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The Mystery of Domestication

- With the horse's evolution story understood, the real mystery was in determining when humans first tamed them.
  - Unlike dogs or cattle that were domesticated 10-15,000 years ago, horse bones look similar whether wild or tamed.
  - Archeologists must rely on indirect evidence such as the presence of corrals, bit wear, isotope, and DNA.
  - Debate continues over whether domestication first occurred in Kazakhstan, Ukraine, or Russia, with each new discovery adding another piece to the puzzle.

Early Experiments on the Steppe

- One of the earliest and most compelling pieces of evidence comes from the Botai (BOH-tie) culture of northern Kazakhstan from 3500-3000 BCE.
  - Archeological sites reveal fence post holes and circular enclosures, suggesting people were corralling horses.
  - Horse bones dominate the remains at Botai settlements, showing they were central to the community's livelihood.
  - Chemical residue of mare's milk on pottery indicate people were milking horses, not just hunting them.
  - Tooth wear patterns suggest horses were fitted with bits, a possible sign of riding or harnessing.
  - But the evidence was complicated. The horse bones found at Botai sites showed an even split of males and females of breeding age, a pattern more consistent with hunting than herd management.
    - Some horse skeletons even contained embedded projectile points, confirming that hunting was still common.
  - Ancient DNA later showed that Botai horses are ancestors of modern Przewalski's (shuh-VAHL-skee) horses, not today's domesticated lineage.
  - Taken together, the findings suggest Botai people may have been a transitional stage in which there was hunting of wild horses while also experimenting with early domestication.

Background: We Changed Horses

Wild horses roam freely on Vodny Island in Russia's Rostov Nature Reserve, descendants of the untamed herds that once dominated the Eurasian steppe.

Credit: Игорь Шпиленок - http://shpilenok.livejournal.com/182339.html, CC BY-SA 3.0, - https://commons.wikimedia.org/w/index.php?curid=27188228

The Yamnaya and the Western Slope

- The Botai story left too many questions unanswered. Clues then shifted west to the open grasslands of the Pontic-Caspian steppe. The debate over domestication continued with the Yamnaya culture.
  - The Yamnaya were a pastoral society that resided on the west of the Ural Mountains in what is now Ukraine, southern Russia, Moldova, and Romania.
    - The culture flourished between 3300-2600 BCE, taking advantage of the vast treeless grasslands, ideal for grazing animals.
  - Human remains from the area detected skeletal problems, resembling those seen in mounted riders. This evidence suggested they were early horsemen.
  - Further study recognized that these same skeletal features could also come from riding in ox-drawn carts, which are known from the Yamnaya sites.
  - Recent genetic studies also show that the Yamnaya horses were not the direct ancestors of today's domestic horses.
    - Their horse remains show no clear signs of selective breeding or control, such as inbreeding patterns seen in later domesticated horse lineage.
  - The Yamnaya lived in close contact with horses, but current evidence does not support them as the origin of modern domestic horses.

A new Lineage

- Around 2000 BCE, archeological and genetic evidence reveals the rise of a new type of horse on the western steppe. Unlike earlier horses, this lineage shows signs of human management and breeding.
  - DNA studies demonstrate that these horses were selectively bred, showing patterns of inbreeding and genetic bottlenecks, typical of animals under human control.
  - This is the first clear genetic signal of sustained domestication.
  - The first evidence of wheeled chariots also appears during this period, linking horses directly with new transportation and warfare technologies.
- Within a few centuries, this new horse type spread rapidly across Eurasia. Their spread was so successful that they replaced earlier horse populations, including those of the Botai and Yamnaya.
  - Their speed, endurance, and manageability made them ideal partners for humans.
  - Geneticists call this lineage DOM2 to distinguish it from earlier domestication attempts.
  - DOM2 horses became the ancestor of every modern domestic horse, from draft horses and ponies to thoroughbreds.
  - This marks the true beginning of horse domestication as we understand it today.

The Horse and Human History

- From this breakthrough, the horse's role shifted quickly. Within a few centuries, the horse became central to human history.
  - Horses allowed people to travel farther and faster than ever before, linking distant regions.
  - Calvary and chariots gave armies unprecedented speed and power, altering the scale of conflicts.
  - Horses could pull plows and carts, increasing efficiency and food production.
  - Horses expanded trade networks and sped up the exchange of goods, ideas, and cultures across Eurasia.

Background: We Changed Horses

  - Horses enabled large-scale movements of people, supporting the growth of powerful states and empires.
- From the moment they were truly domesticated, horses became inseparable from human progress, reshaping civilizations and leaving a legacy that endures to this day.

A modern thoroughbred, like those racing in the Kentucky Derby, carries the legacy of the DOM2 lineage that first appeared around 2000 BCE. Centuries of selective breeding have refined traits like speed and endurance but have also narrowed the genetic diversity of domestic horses.

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References: We Changed Horses

The Tale of the Domesticated Horse I Knowable Magazine

Domesticating Horses Had a Huge Impact on Human Society I The Conversation

Human's Didn't Domesticate Horses Until 4,200 Years Ago – A Millenium Later Than Thought I Live Science

Humans Domesticated Horses – New Tech Could Help Archeologists Figure Out Where and When I The Conversation

How Horses Shaped Human Civilization I The Collector

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