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UCT researcher involved in paper that rewrites the history of horse domestication in North America

When a large international group of archaeological researchers were looking for the strontium isotope data, they required to link the ancient North American horse to the land, and they contacted the University of Cape Town (UCT). Combining DNA sequencing with radiogenic isotope analysis and indigenous knowledge, a paper recently published in *Science* rewrites the history of horse domestication in North America.

Although seemingly geographically far-removed from North America and Europe, the multi-collector inductively coupled plasma mass spectrometry facility (MC-ICP-MS Facility) in the Department of Geological Sciences at UCT has a global reputation for excellence in the specialised field of radiogenic isotope analysis. This is especially true for novel scientific applications.

The continent of North America is where horses first emerged. Millions of years of evolutionary changes transformed the horse before it became the natural companion of many indigenous peoples and the flagship symbol of the southwest. An international team uniting 87 scientists across 66 institutions around the world has been working together to refine the history of the American horse. This work, which embeds cross-disciplinary and cross-cultural research between western and traditional indigenous science, was published in the journal *Science*.

Dr Petrus le Roux, director of the MC-ICP-MS Facility and co-author, says: "This work shows the outsized scientific impact of a well-resourced and well-run facility. The ongoing support of the Facility and University Equipment Committees has been critical in keeping us at the cutting-edge of analytical geochemistry. None of this would be possible without the excellent scientific support staff, Ms Kerryn Gray and Ms Fayrooza Rawoot. I am lucky to have them in the lab. This study is also ground-breaking in terms of the level of indigenous scientists and community involvement at all levels."

"Horses have been part of us since long before other cultures came to our lands, and we are a part of them," says Chief Joe American Horse, a leader of the Oglala Lakota Oyate, traditional knowledge keeper, and co-author of the study.

In 2018, at the instruction of her elder knowledge keepers and traditional leaders, Dr Yvette Running Horse Collin contacted French National Centre for Scientific Research (CNRS)

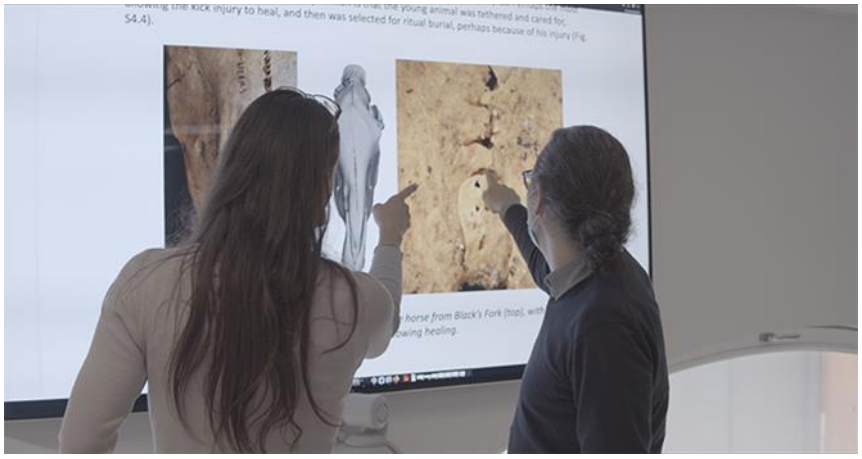
scientist, Professor Ludovic Orlando. She had completed her PhD, which focused on deconstructing the history of horses in the Americas.

Up until that point, the field had been dominated by western academics, and indigenous voices had been largely dismissed. She sought an opportunity to develop a research programme in which traditional indigenous sciences could be brought forward and considered on equal footing with western science. The elders were clear: working on the horse would provide a roadmap for learning how to combine the power of all scientific systems, traditional and western alike. And by doing so, eventually provide new solutions to the many challenges affecting people, communities, and biodiversity around the globe.

Archaeological science has emerged as a powerful tool to understand the past. Over the last decade Professor Orlando and his team of geneticists have extracted the ancient DNA molecules still preserved in archeological remains to rewrite the history of the domestic horse. They have sequenced the genomes of several hundred horses that lived on the planet thousands of years ago, up to even 700 000 years ago. Professor William Taylor, Assistant Professor at the University of Colorado, and a team of partners including archaeologists from the University of New Mexico and University of Oklahoma set out to track down archaeological horse bones from across the American West together with his Lakota, Comanche, Pawnee and Pueblo collaborators. Using both new and established practices from the archaeological sciences, the team identified evidence that horses were raised, fed, cared for, and ridden by indigenous peoples.

The genome evidence demonstrated that the horses surveyed in this study for many Plains Nations were primarily of Iberian ancestry, but not directly related with those horses that inhabited the Americas in the Late Pleistocene more than 12 000 years ago. Likewise, they were not the descendants of Viking horses, despite Viking establishing settlements on the American continent by 1021. Archaeological data show that these domestic horses were no longer in exclusive Spanish control by at least the early 1600s and were integrated into indigenous lifeways.

Importantly, this earlier dispersal validates many traditional perspectives on the origin of the horse from project partners like the Comanche and Pawnee, who recognise the link between archaeological findings and oral traditions. Comanche tribal historian and study co-author Jimmy Arterberry states: “These findings support and concur with Comanche oral tradition. Archaeological traces of our horse culture are invaluable assets that reveal a chronology in North American history and are important to the survival of indigenous cultures. They are our heritage, and merit honor through protection. They are sacred to the Comanche.”



Dr Yvette Running Horse Collin and Professor Ludovic Orlando

Photo: Northern Vision Productions

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