NEW MEXICO HISTORIC SITES

Musical Instruments of the Pueblo People Video

With Instructional Coordinator Marlon Magdalena

WRITING ACTIVITY (9-12)

View the video and read the article, *A Macaw Breeding Center Supplied Prehistoric Americans with Prized Plumage,* then answer the questions.

How far would someone have to travel to find a Scarlet Macaw?

What sorts of evidence is there for Macaw breeding in the Southwest?

Why would the Pueblo People go to such lengths for the Scarlet Macaw?

Research any culture from around the world that uses feathers. How and why do they use them? Compare and contrast to how the people of Chaco Canyon or Modern Pueblo People use feathers. Suggested length, 300-500 words.

A Macaw Breeding Center Supplied Prehistoric Americans With Prized Plumage

This yet-undiscovered breeding center is likely one of the first instances of exotic animal husbandry in the region

By Katherine J. Wu

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A remote northwestern corner of what is now New Mexico isn't the first place you'd expect to find a scarlet macaw. But the scattered bones of these vibrantly plumed parrots, which hail from the dense tropics of southern Mexico and Central and South America, speckle the ruins of prehistoric civilizations in the North American Southwest. How ancient peoples acquired so many of these cherished birds from hundreds or even thousands of miles away has posed a longstanding scientific puzzle—until now.

New evidence shows for the first time that the North American Southwest was home to a smattering of scarlet macaw breeding centers as early as 900 AD. Prized by the prehistoric residents of Chaco Canyon for their religious and cultural significance, macaws appear to have been raised in one of the first sustainable systems of non-agricultural animal husbandry in this region, a nod to the sophistication of early residents of the American Southwest.

Chaco Canyon is a snapshot of a bygone era. The ancient New Mexican site, a longtime ceremonial center of the ancestral Pueblo peoples, is widely considered one of the most impressive feats of prehistoric architecture in North America. The multi-storied living quarters, defensive towers, irrigation systems and community gathering spaces carved into cliff faces are surrounded by acres of sun-scorched deserts, isolated from the nearest modern town by 70 miles of unfinished roads.

It's been nearly a thousand years since Chaco Canyon was inhabited. But the site remains pristinely preserved, commemorating an ancient civilization that has astounded archaeologists with evidence of its advanced technology and intricate societal hierarchy.

Among the Pueblo Indians' most cherished cultural emblems was the scarlet macaw—a brilliantly rainbow-plumed parrot.

Macaws had an elevated position in Pueblo pecking order. Their feathers in particular denoted prestige, and remnants of their plumage adorn prayer sticks and accessories. Their faces are immortalized in parrot portraits etched onto dry rocks. Shards of pottery feature the luxurious multicolor wingspans of birds alighting on the arms of supernatural beings, indicating their prominence in Pueblan cosmology and mythology (and, admittedly, in religious rites that often ended in their ritual sacrifice).

Anthropologists speculate that the parrots were revered for their eerie ability to mimic human speech and their decades-long life spans—both characteristics that may have further humanized them in the eyes of their keepers.

"It's in [native peoples'] social memory how important macaws were," says Erin Smith, an anthropologist at Washington State University. "Even at points in history when trade relationships broke down, they were a significant part of the culture."

Scarlet macaws, however, are native to tropical forests hundreds of miles south of Chaco Canyon, and wouldn't have sought these sweltering sands by choice. A full millennium before the rise of the first commercial airplane, acquiring these birds would have been no easy task.

To meet continual demand for this cherished commodity, prehistoric communities could have traded for them. Evidence exists of active bartering of goods like cacao, copper bells and seashells between

Mesoamerica and the North American Southwest. But ferrying a small flock of squawking, disgruntled parrots wasn't exactly comparable. Shells and beans don't need food and water; shells and beans don't nip at fingers with beaks powerful enough to fracture the sturdy shells of tree nuts.

But scarlet macaws were clearly worth a fair amount of trouble. Their bones are found in the Southwest as far north as Utah, as far back as 300 AD. It's possible that dedicated envoys made multiple challenging and treacherous marches, requiring at least a month's travel each way, for such precious cargo. Alternatively, the birds could have been passed from village to village, using intermediate rest stops on the journey north. While this would have divvied up the burden, a relay system would have prolonged the excursion even further.

To uncover the origin of the macaws of Chaco Canyon, a team of scientists led by Richard George, an anthropologist at Pennsylvania State University, analyzed the bones of 14 scarlet macaws recovered from five sites in Chaco Canyon and the Mimbres region of New Mexico. The researchers focused their efforts on extracting mitochondrial DNA, which is passed down maternally from mothers to their offspring, and is a relatively quick and cost-effective way to assess ancestry compared to sequencing the birds' full genomes, according to Robin Allaby, a professor with expertise in archaeological genomics at the University of Warwick. With these genetic tools, the team hoped to match the macaws to ancestral populations in Central and South America and trace potential trade routes backwards in time.

But the macaw bones revealed an unexpected result. George and co-author Stephen Plog, a professor of archaeology at the University of Virginia, were shocked to find all 14 macaws were extremely genetically similar—so much so that it appeared 71percent of them likely shared a maternal lineage.

This wasn't at all in keeping with the parrots being repeatedly plucked from the southern tropics, or being relayed from village to village. Macaws are notoriously flighty—even for birds—with geographic ranges that can span over a hundred miles. It would have been nearly impossible for Chacoans to chance upon, let alone capture, macaws related to those snared on previous trips.

Instead, the researchers began to entertain a third alternative for the macaws' origin—one that had been repeatedly snubbed by archaeologists in the past: a northern macaw breeding center—perhaps the first of its kind in the region.

It's not out of the question. An archaeological site at Paquimé, Mexico houses the remains of a large aviary from which the bones of over 300 macaws have been uncovered. But the height of civilization at Chaco Canyon, between 850 and 1150 AD, significantly predates Paquimé, which rose to prominence between 1250 and 1450 AD. And radiocarbon dating confirmed that all the macaws studied had lived at a time that roughly coincided with the Chacoan era. The New Mexican macaws, it seemed, had originated not from Paquimé, but from at an older, more northerly site still undiscovered. This is the first evidence of a breeding center most scientists previously thought improbable. However, a handful of researchers, including Patricia Crown, a professor of anthropology at the University of New Mexico, had long suspected ancient macaw aviaries to be buried beneath the sands of this northern region. Mimbres pottery, for instance, depicts juvenile macaws—far too young to have been chauffeured on the month-long trip from the birds' natural habitat, especially as fragile chicks, says Crown.

Even if macaw hatchlings were transported at the earliest possible age—about seven weeks old—they would have aged rapidly on the harrowing trip north. Even the most determined of journeymen, hoofing it at breakneck speed, couldn't have kept the necessary pace to convey such young parrots to potters in Mimbres.

"There's been evidence of macaws in the southwest [in the first millennium AD], but to have breeding centers close to the southwest is an exciting and important prospect," says Crown, who was not involved in the work.

For George and his colleagues, the sociopolitical implications were just as, if not more, exciting. “This is important… not only the population history of macaws and human interaction, but also what was happening between groups of people,” George says.

According to Plog, the research supports the notion of a sustained, entrepreneurial partnership between the residents of Chaco Canyon, Mimbres and the still-unknown location of this early breeding center. Additionally, the presence of an early aviary indicates that villages of this era were already starting to specialize in sectors of business: Raising macaws served one purpose and one purpose alone—but met growing demand for a highly valuable commodity.

“For a long time, people doubted there were these intense connections [between such distant locales],” says Smith. “This paper is providing solid DNA evidence of these connections, and how complex and dynamic these relationships were.”

The researchers theorize that this yet-undiscovered breeding center was either in the North American Southwest or the northwestern reaches of Mexico, but its exact location awaits confirmation. In their future work, George, Plog and their colleagues will continue to analyze the DNA of macaw remains in these regions, confirming their initial findings and narrowing down potential sites of interest. George notes that this mysterious breeding center was probably small, considering how inbred the Chaco and Mimbres macaws appear to be.

Given their enormous cultural capital, the rearing and exchange of scarlet macaws may have motivated some of the earliest economic foundations of the prehistoric societies of the North American Southwest and Mesoamerica. Despite the isolation and aridity of the region, ancestral peoples must have labored to house their lucrative macaws—and the chore of macaw husbandry wasn’t exactly a walk in the park. Macaws mate for life and have a reputation for being (understandably) finicky about human motivated matchmaking, Crown says. What’s more, these tropical birds have a fairly specialized diet and would have required constant nurturing in a desert climate.

Ultimately, this improbable feat is a testament to the ingenuity of the early peoples of the North American Southwest. Breeding macaws warranted just the right mix of patience and sophistication—and maybe a high tolerance for shrieking.

About Katherine J. Wu

Katherine J. Wu is a Boston-based science journalist and Story Collider senior producer whose work has appeared in National Geographic, Undark magazine, Popular Science and more. She holds a Ph.D. in Microbiology and Immunobiology from Harvard University, and was Smithsonian magazine's 2018 AAAS Mass Media Fellow.