

# A MEETING OF SCIENCE



*Dale Croes (left) and his crew prepare a large, 700-year-old clam basket for removal from the Qwu?gwes wet site.*

**S**quamish elder and master basketmaker Ed Carriere was thrilled when he first saw the fragments of ancient cedar baskets in the Biderbost Collection at the University of Washington's Burke Museum in Seattle. Carriere was fourteen when tribal elders first taught him how to weave traditional baskets. At age eighty, seeing a fragment one of his ancestors had created by hand 2,000 years ago was something new. "It really got me so interested that I just had to replicate and weave like that," Carriere said.

The visit to the Burke, which took place in 2014, was the result of a collaborative effort between Carriere and archaeologist Dale Croes, an adjunct professor at Washington State University. The men had joined forces over a decade earlier when Croes began inviting Carrier to his digs

to help excavate 700-year-old clam baskets almost identical to those Carriere has made throughout his lifetime. Their combination of scientific approach and traditional cultural knowledge has expanded our understanding of the history and techniques of Northwest basketry and its importance in native culture. In the process, the men have made beautiful baskets and become close friends.

Native groups in the Pacific Northwest have used baskets woven from plant materials for millennia. Most are made from the roots or boughs of cedar or spruce trees, and are used for storing dried foods or transporting goods. Some designs are suited for specific purposes: for example, Carriere's traditional Coast Salish clam baskets have a large carrying handle on top and an open weave to wash out sand.

LARRY GILL

# AND CULTURE



*Ed Carriere weaves a cattail basket. He also wove the cedar-bark vest and cedar-bark hat he's wearing.*

In 2004 archaeologist Dale Croes and Native American basketmaker Ed Carriere began an unusual collaboration to study and eventually reconstruct ancient baskets from the Pacific Northwest.

*By Julian Smith*

Watertight sewn baskets, made with a coiling technique, can be used to boil food when heated rocks are added. "Our societies couldn't have gone on without them," said Bud Lane, vice chair of the Confederated Tribes of Siletz Indians and president of the Northwest Native American Basketweavers Association. "We carried our babies, our food, our firewood." (Lane is also a master basketmaker.)

Carriere learned to weave by watching his great-grandmother, Julia Jacobs, who raised him from infancy. After serving in the Marines and retiring as a machinist in 1988, he devoted all of his time to basketry and canoe carving. He sells his finely crafted creations to collectors, but still uses his own clam baskets as his ancestors did.

Croes' interest in basketry began early in his academic

career, when he started investigating waterlogged areas known as wet sites in the Pacific Northwest in the 1970s. (The anaerobic conditions at wet sites help preserve perishable organic artifacts.) He had to learn basketmaking techniques as part of his master's degree research at the Ozette wet site on the northwest tip of the Olympic Peninsula in Washington State. Ozette consists of six longhouses that were covered by a mudslide in the sixteenth century. Over a decade of excavations there have uncovered more than 55,000 artifacts, including woven mats, hats, and several whole baskets. The Makah Tribe, which owns the site, required that Croes learn the craft from tribal elders so he could better understand ancient Ozette basketry.

Croes eventually developed a method of classifying

basket types according to five main attributes: material, shape, bottom weave, body weave, and attachments such as handles. Having used this method to classify basket types at Ozette, Croes employed it at all other dated wet sites along the Northwest Coast of North America. With this data, he compared basketry attributes and types among sites to discern any resulting patterns through some 3,000 years of time along the entire coast.

In his 1977 Ph.D. dissertation he identified three regions whose inhabitants displayed continuity in the style of their basketry over long periods of time. Those regions are the outer Salish Sea, including the Olympic Peninsula; the middle and northern coast of British Columbia, in Canada; and the inner Salish Sea, encompassing Puget Sound in Washington and the Gulf of Georgia in British Columbia. Croes hypothesized that the continuity of their basketry was an indication of a broader cultural continuity. Croes also suggested that basketry is an expression of cultural identity on the coast and elsewhere, and consequently these styles were not shared between the inhabitants of these regions.

Croes subsequently began examining baskets from the perspective of an evolutionary biologist. With the help of Mark Collard, a biological anthropologist at Simon Fraser University in Canada, Croes used a statistical technique called cladistic analysis to trace the evolution of basketry attributes and types over time and space. Cladistics is often used to analyze the evolution of species and languages, Collard said, as well as material culture like pottery. Based on the idea that basket types that share certain characteristics are more closely related than ones that don't, Croes produced a cladogram, a branching diagram similar to a family tree,

except with basketry styles in the place of uncles, cousins, and grandparents. The cladistic analysis corroborated Croes' hypothesis of continuity in basketry styles in the inner and outer Salish Sea, and the middle and northern British Columbia coast. "It's a pretty novel way of approaching this in archaeology," Collard said.

Croes and Carriere met in 2000 at the 100th birthday party for Isabell Ides, Croes' primary Makah Indian basketry teacher. They discovered that Ides had been childhood friends with Carriere's great-grandmother, Julia Jacobs, and they struck up a friendship rooted in their mutual interest. Four years later, Croes invited Carriere to visit the Qwu?qwes wet site he was excavating with the Squaxin Island Tribe near Olympia, Washington. The excavation had yielded fragments of clam baskets woven from cedar limbs and roots. Some of the basket fragments were 700 years old.

Carriere noted the fragments were almost identical to the baskets he made, and he instructed Croes and his students about basket-making techniques and materials, which informed their analysis of their archaeological discoveries. Carriere also showed how small stone blades found at the site were used to trim cedar limbs and roots, and what kind of waste materials the construction left behind. "The combination of Ed's cultural connection and my scientific perspective [gave] us an understanding that neither one of us could have attained separately," Croes said.

In 2014, Croes invited Carriere to help him reassess the Burke Museum's Biderbost Collection, which consists of sixty-eight pieces of basketry excavated in the 1950s and '60s from the Biderbost wet site in Washington State.



*The designs in Carriere's life-story basket represent important things in his life. He was an avid mountain climber, often camping under the stars. The white strip at top is the Milky Way, and just below it are crescent moons and stars. The white lines are lightning strikes above pyramid-like mountains. Within and below the mountains are brown stylized hands and fingers and black salmon gills. Below those are three rows of white salmon back bones. Resting on the blue bead row representing water is the canoe Carriere carved. A stylized fish net hangs below the water line followed by the symbolic Suquamish chain stitch that holds people together.*

DALE CROES

(Biderbost is now owned by The Archaeological Conservancy.) The pieces, which date to 2,000 years old, were almost all from large, heavy-duty pack baskets, probably for carrying or storing fish.

“Indigenous cultural artisans rarely know (that collections like Biderbost) exist,” Croes said. Laura Philips, the museum’s archaeology collections manager, asked Carriere to recreate some of the collection’s fragments into whole baskets. Kathleen Hawes, Croes’ assistant, performed microscopic analysis of the artifacts that showed they were made from strong, flexible roots of western red cedar. Carriere then used the same material in his re-creations of whole

baskets for authenticity.

The next step was figuring out what the baskets looked like when they were whole. “Understanding how these baskets were shaped was critical in understanding how to replicate them,” Croes said. Carriere concluded that the pack baskets had a trapezoidal shape with a rectangular base with rounded corners, sloping sides, and a larger rectangular mouth that also had rounded corners. He and Croes agreed that the easiest, and perhaps the only, way to weave baskets in such a specific shape was to do it around a solid form. They used Styrofoam, but the ancient weavers probably used bentwood cedar boxes. “It’s one thing to say ‘This is how I



*This map shows the three areas—the inner and outer Salish Sea, and the British Columbia coast—that were the focus of Croes’ research. He concluded that the continuity of the basketry styles in these areas was an indicator of a broader cultural continuity. Croes worked at the wet sites with black dots.*



*Carriere wears a spruce-root-twined Northwest coast chief's hat while giving a talk at the Wetlands and Archaeology conference in 2017 in Morvan Regional Natural Park, France.*

1,000 years old

**Cross-Warp Twining**

2,000 years old

**Open Twining**

3,000 years old

**Wrap-Around Plaiting**

4,500 years old

**Dual-Warp Wrapped**

think it was made,' and another thing entirely to make the baskets—to take what's essentially a two-dimensional object and re-create the whole thing," Phillips said. "It has been wonderful to encourage this kind of process and to be able to be a part of it."

Some of the Biderbost basket fragments had reinforced double rows below the upper rim, where carrying handles were attached. This was common for baskets found at wet sites dating to 2,000 years old in the inner Salish Sea. Carriere explained that baskets with this kind of handle would have been easier to carry using a tumpline around the forehead, compared to baskets that had handles right on the rim. Carriere eventually made eight baskets based on the Biderbost designs. "I can't believe how much I learned by doing this," he said. "I thought I knew it all, but I didn't. I learned several

new weaves and different ways to put the handles on the baskets and support tumplines."

Since the Biderbost project, the men have visited other sites and collections together, including the Fraser River Delta Basketry Collection at the University of British Columbia Museum of Anthropology. By modifying his weaving technique slightly, Carriere was able to make replica sample weaves of the 3,000-year-old baskets, and even one that dated to 4,500 years old.

This inspired him to create what he calls an "archaeology" basket, which demonstrates the evolution of weaving over the millennia. Four sequential layers show different weaving techniques, starting at the bottom with the 4,500-year-old basket style from the Glen Rose Cannery



DALE CROES

***Carrier's archaeology basket features weaves used by his ancestors over a 4,500-year period.***

site. Above that are 3,000-year-old basket techniques from the Musqueam Northeast site, and then 2,000-year-old basketry weaves from the Water Hazard and Biderbost sites, and lastly a weave found in 1,000-year-old wet sites. The result is a single basket that records the techniques used by 200 generations of his Salish ancestors.

Croes has labeled his and Carrier's efforts "generationally-linked archaeology," contending that their collaboration, which approaches basketry from different perspectives and

temporal directions, is something new to the science. Croes' focus is from deep-time forward, statistically tracing ancient traditions over the course of more than 4,000 years, while Carrier, as he studies the ancient basket styles and weaving techniques of archaeological samples, works from the present to the past. "All this helps explore my hypotheses where I explain on-going cultural continuity in three regions of the coast," said Croes.

He continues to test these hypotheses using basketry



BIDERBOST FRAGMENT (LEFT) BURKE MUSEUM ARCHAEOLOGY DEPART-

**Carriere's wove a small, open-twine replica basket (right) based on a 2,000-year-old fragment from the Biderbost site.**

from Northwest Coast wet sites that have been discovered since he wrote his dissertation, and, he said, the evidence supports his earlier conclusions. Through his work with Northwest basketmakers, Croes has reaffirmed that basketry styles reflect their cultural identity.

He and Carriere have shared their story with both academic and native audiences in the U.S. and abroad. "The tribes see [the work] as important," Croes said. Lane, of the Northwest Native American Basketweavers Association, agreed, noting that interest in basketry is still strong among the tribes. "We're planting that seed all the time, especially among young people, at our gatherings and culture camps." He called Croes and Carriere's collaboration "unique," adding that "it's awesome to see science and our culture kind of collide in a good way."

Linking contemporary cultural artisans directly with their ancestors through the study of basketry artifacts makes it possible to preserve and perpetuate the traditional skills. "While people may have always believed they were descended from these early people," Croes said, "there is something culturally strengthening about seeing something truly tangible and scientifically supported regarding that direct ancestral connection."

In 2018, Croes and Carriere published a book about their collaboration and friendship titled *Re-awakening Ancient Salish Sea Basketry: Fifty Years of Basketry Studies in Culture and Science*. The Suquamish Museum on the Port Madison Indian Reservation is planning a large exhibit based on

their re-created baskets in 2019. Through funding from the Burke Museum's Bill Holm Center, Carriere has been able to train young native basketmakers, and he acquired a skilled apprentice named Josh Mason, a member of the Squaxin Island Tribe.

Collaborating with Carriere was "probably the best idea I ever had," Croes said. "Working with Ed and listening to how he described the various elements of the baskets, sharing our thoughts as we debated and questioned what we were seeing, gave me an entirely new perspective on ancient basketry technology." And Carriere stated that his work would not be possible without the archaeological discoveries. "Having these artifacts to hold and study has opened the door to deep rooted cultural transmission, teachings through the generations, and showing how many of our Coast Salish traditions have continued to the present," he said. "Traveling all over with Dale, to all these sites and conventions, I'm almost becoming an archaeologist myself," he added with a laugh.

Carriere also noted that the work has put him in much closer touch with his forebears, at times in an almost literal sense. "Sometimes when I'm weaving and it's just not turning out like the old sample, then I take it apart, and I can feel those ancestor's hands coming in and helping my hands. I'm doing this in honor of those early weavers."

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