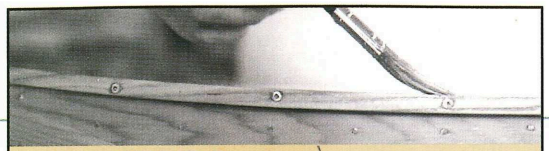
WOODEN CANOE

The Journal of the Wooden Canoe Heritage Association



A BOATFUL OF BOTANY

A COURSE IN HISTORY, SCIENCE, AND BOAT BUILDING

BY JOHNNY CLORE, LAWRENCEVILLE, NJ

Boat building programs for young people provide skills and experiences that may steer lives in new directions. Here the author and his fellow teacher offer even more - a combination of skills development and academic growth in history and science.

Thuja plicata, the western red cedar

When I arrived at The Lawrenceville School in the fall of 2012, my hands were still rough with the calluses of paddling 1,200 miles through Vermont, Quebec, and Ontario in handmade wood-canvas canoes for the Keewaydin Foundation's Expedition 2012. Along with my 9 tripmates and under the expert tutelage of WCHA member Schuyler Thomson, we had built those canoes for the express purpose of our expedition, and each day we reveled in the enduring beauty of these traditional craft. So, even as I turned my attention away from portage trails and canvas repairs towards new faculty orientation and biology lesson plans, my notebooks still filled up with sketches of canoes and my head began to swim with ideas of how to weave canoe building into Lawrenceville's rigorous academic program. Those ruminations remained latent for years, consistently relegated to the margins, but never fully forced off the page.

A few years later, Steve Murray, Lawrenceville's Head of School and a veteran of many wilderness canoe trips in his own right, introduced a new strategic plan to energize academic culture by connecting head, heart, and hands in the service of deeper, more meaningful learning. This vision reinvigorated my desire to teach canoe-building; there could be no better way to develop these connections than through the creation of a deeply spiritual craft whose construction is so exacting and whose historical and cultural significance runs so deep. With renewed inspiration, in 2017 I began

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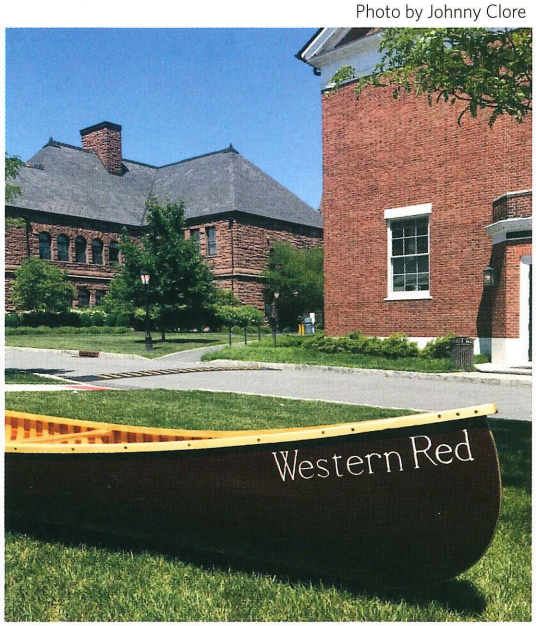
to assemble a syllabus for my yet purely theoretical course, entitled "The Canoe: Form, Function, Geography and Culture." The reading list included John McPhee's classic, T*he Survival of the Bark Canoe,* Jerry Stelmok and Rollin Thurlow's essential volume, *The Wood and Canvas Canoe: A Complete Guide to its History, Construction, Restoration and Maintenance,* and the invaluable and beautiful work of Mark Neuzil and Normal Sims, *Canoes: A Natural History in North America.*

With the outline of a course in place, ideas that had been circulating in the eddies of my mind began to sweep into the currents of real, tangible possibility. Still, there were many questions to be answered. First, where would we build the canoe? Lawrenceville has multiple wood shops, but none had the space or tools necessary to manage canoe construction. Second, as a science teacher, how would I be able to justify the idea of dropping one of my biology sections to teach canoe building?

Photo by Johnny Clore



Western Red sits outside of the Gruss Center for Art and Design on the historic Lawrenceville School campus.

Answers to these questions began to emerge when one of Lawrenceville's history teachers, Drew Inzer, approached me about a course that he was planning. He had recently begun to deeply explore the rich scholarship surrounding the Lewis and Clark Expedition and he was planning a new course that would cover this fascinating and pivotal chapter in North American history. Given the significance of canoes and canoe building for Lewis and Clark, Drew recognized an opportunity to join forces; given the extensive botanical collections and species descriptions offered by Lewis, it would be natural to teach botany in conjunction with history and canoe construction. It soon became clear that the real power of these elements is at their intersection. How better to teach the plants of Lewis and Clark than by shaping the wood of those plants to build the vessel that shaped their journey and the history of North America? The dry facts of binomial nomenclature, plant phylogeny, and wood characteristics would come to life as a part of our canoe while science, history, and craftsmanship would be seamlessly woven into an interdisciplinary, experiential course.

Fortunately, Lawrenceville would soon open a massive, newly renovated and expanded facility, the Gruss Center for Art and Design (GCAD), which would house a new wood shop and boast open spaces ideal for the construction of a 17-foot canoe. The timing was perfect and even the architecture seemed destined to support canoe construction; exposed steel I-beams were spaced 21 feet apart, ideal intervals to accommodate our canvas stretching jig. Now that we had a home for our shop, Drew and I got busy. We built a form based on Rollin Thurlow's plans for the Atkinson Traveler, constructed a steam box with a modified turkey fryer boiler, and we milled lumber for all the elements of this yet unborn

boat. Then, finally, in the spring of 2021 we began building our first canoe and marveled once again at the awesome power of the process, a power redoubled when taught to high school students who could scarcely imagine what they were gradually bringing to life, one rib and one plank at a time.

And as we built, we taught, not just how to bend a rib or trim a plank, but about the history of canoes and the story of the trees whose wood we shaped. It was in this teaching, in this learning, that the lumber, felled, dried, and milled, began to come back to life. When you can see and feel and smell a western red cedar plank with its rusty brown hue, its remarkably perfect, vertical grain, its sweet, resinous aroma, then *Thuja plicata* becomes something more than just a scientific name. Then, when you read of this magnificent tree, "the Arborvita" that Meriweather Lewis noted in September 1805, growing to "immense size," with trunks "large enough to form eligant perogues of at least 45 feet in length," you begin to feel a living connection with the Expedition. Then, when you learn about this tree's central roles in canoes and cultures of the indigenous people of the Pacific Northwest, it becomes impossible to see it as just another plant, just another plank of wood, just another inanimate component of an inanimate boat. Instead, this boat and this wood become a part of living history, stretching back through time and carried into our classrooms and workshops by the spiritual power of its botanical origins.

Johnny Clore paddles Western Red on the Lawrenceville School pond. Photo by Andrew Wilson

Those origins then open a door to further exploration of the boat, the Expedition, and the natural world. For example, just as Lewis recognized *T. plicata* based on his existing knowledge of its cousin, *T. occidentalis*, so too can we frame our learning about the northern white cedar based on our previous study of the western red. Both species share rot resistant wood, fibrous bark, scale-like needles arranged in flattened fans, and small, woody, upright cones.

The supple pliability of the creamy, lightweight, northern white cedar was a revelation to our students as they pulled ribs from our steam box and bent them over the form, but Lewis and Clark did not bend ribs for their canoes. The wood-canvas canoe hadn't yet been invented as they travelled west across the continent, and the magnificent birch bark vessels of the day would have required materials and expertise beyond their geographic range and their skills. Instead, once they left their keel boat behind, it was largely dugout canoes that carried the Corps of Discovery. The crew felled and hollowed massive cottonwoods for the journey up the Missouri. The cottonwoods were central to the success of the expedition and are keystone species in their ecosystem. They still line the riverbanks in an otherwise treeless landscape, and their soft heartwood makes snug, hollow homes for animals from racoons to rattlesnakes.

No cottonwood lumber would be featured in our canoe, but the study of these trees (*genus Populus* - aspens, poplars, and cottonwoods) and their connection to Expedition canoe history represented our first foray outside the realm of gymnosperms (including the cedar and spruce that we used) and into the realm of angiosperms, the most diverse group of plants on the planet. In this group, we can find the White Ash *(Fraxinus americana)*, used in building the stems, thwarts, and seats, and the Black Cherry *(Prunus serotina)*, used for the decks. Both of these species were already well known to Lewis before the Corps of Discovery set out, but he described and collected several related species along the way. Therefore, as we sanded the beautiful reddish grain of our black cherry decks, we read in his journal when Lewis used a decoction of the chokecherry, *Prunus virginiana*, to resolve a "violent pain in the intestens." As we fit the stem into the mortise on the underside of the deck and screwed our inner gunwales to its sides, we read Lewis' description of *Prunus pensylvanica,* the pin cherry, which featured "a globular berry

about the size of a buck-shot of fine scarlet red." Through this study and our ongoing canoe constrution, these plants became more than just trees, shrubs, berries, or planks of wood; they became alive in the minds of our students and the spirit of our boat.

Lewis also mentioned observing a variety of ash trees along his journeys, but contemporary history provides an even more poignant opportunity to learn about a tree in ways that transcend leaf shape and wood characteristics. The emerald ash borer, a small beetle native to Asia and introduced to the United States in 2002, attacks ash trees by tunneling into the sapwood and cutting off the flow of essential nutrients, rapidly debilitating and eventually killing the tree. The beetle has spread from Michigan, where it was first detected, to states across the Midwest and east coast, and it has destroyed nearly all of the ash trees on our New Jersey campus. Walking through the woods with our students, noting the tall straight trunks and entirely leafless branches of these once-great trees, one cannot help but feel a sense of responsibility to the natural world from which we extract the materials to build a canoe. Indeed, as we bent our stems and shaped our thwarts, this responsibility compelled us to high standards of craftsmanship, and we were reminded of the wisdom of Richard Powers' novel, *The Overstory*, which asserts that "what you make from a tree should be at least as miraculous as what you cut down."

Although "miraculous" is a high bar, especially for a canoe made by a high school class, our finished product has a distinct and undeniable magic in it; a certain alchemy seems necessary to explain the transformation of a pile of rough

Western Red awaits its first paddle on the Lawrenceville School pond. Photo by Johnny Clore

lumber into a sleek and gleaming boat that glides effortlessly through the water of a tranquil pond. While I would like to take some credit for it, perhaps this magic is not of our own making, but instead belongs to the trees themselves. That would be consistent with the perspective of many native cultures, who believed that the spirit of a tree would live on in the canoes they built. Our students seemed to recognize the truth in this belief and voted overwhelmingly to name the canoe "Western Red" in honor of *Thuja plicata*. I hope that this name will remind all who paddle our canoe to pause and appreciate the boat's botanical roots and perhaps, in a moment of quiet reflection, to feel the spirit of the trees that surround them.

Since 2012, Johnny Clore has taught science at the Lawrenceville School in Lawrenceville, NJ. For many years he taught canoeing skills and led canoe trips at Keewaydin Camp in Salisbury, VT, where he fell in love with the beauty of a wooden canoe.

Drew Inzer, a history teacher at The Lawrenceville School, works with a group of students on the various stages of construction of *Western Red*. Photos by Andrew Wilson