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DUGOUT CANOES FROM LAKES OF THE ADIRONDACK UPLANDS

J. CURT STAGER[1], DAVID FADDEN[2] AND CHRISTOPHER B. WOLFF[3]

1. Natural Sciences Division, Paul Smith's College, Paul Smiths, NY 12970
cstager@paulsmiths.edu

2. Six Nations Iroquois Cultural Center, 1466 County Highway 60, Onchiota, NY 12989
pictographics@live.ca

3. Department of Anthropology, University at Albany (SUNY), Albany, NY 12222
cwolff@albany.edu

"...this is the story of four men who boarded a boat so many years ago... fog has covered footsteps/wind drowned voices."

—MAURICE KENNY (1995)

ABSTRACT

We describe here four dugout canoes that have been retrieved from three water bodies in the Adirondack uplands during the last half century. Two dugouts from Lake Placid and Lake Ozonia, which are kept at the Six Nations Iroquois Cultural Center and Adirondack Experience, respectively, were made by Indigenous or Euro-American people equipped with metal tools and are probably no more than 4 centuries old. Two other dugouts under private ownership that were retrieved from Twin Ponds were almost certainly made by Indigenous artisans with traditional methods. The larger of the two is 6 m long and up to 5 centuries old, possibly the oldest watercraft known thus far from the Adirondack uplands. All of these dugouts were probably built, used, and stored at the lakes they were found in. The great size and weight of the larger Twin Ponds dugout in particular suggests long-term use at the discovery site and therefore challenges persistent claims that Indigenous people did not live in the Adirondack uplands.

The human presence in the Adirondack uplands extends deeper into prehistory than the forests as demonstrated by discoveries of flaked projectile points dating back at least 10,000 years to a time when post-glacial tundra dominated the landscape (Woods, 1994; Lothrop and Bradley, 2012; Stager, 2017; Robinson et al., 2018). Archaeological objects that are not composed of durable materials such as stone or ceramic, however, are rarely preserved in the northeastern United States (Northeast) due to the region's relatively moist climate and acidic soils. Only under rare circumstances are conditions suitable for preserving organic materials that demonstrate a broader use of wood and other raw materials by people throughout the Holocene epoch (the last ca. 11,700 years). Here we present examples of wooden dugout canoes that have been discovered in the Adirondacks under wet, low-oxygen conditions that inhibit decay and thereby provide insights into modes of transport employed by inhabitants of the region in centuries past.

In this article we focus on four dugouts that were recovered from three water bodies in the Adirondack uplands for which we have documented basic physical features and obtained radiocarbon ages (Figure 1, Table 1). The dating was performed by Beta Analytic, Inc. (Miami, FL), on small cylinders of wood taken from the interiors of the boats with an increment borer so as to avoid contamination with sediment or other substances on the surface of the wood that could compromise the accuracy of the radiocarbon dates.

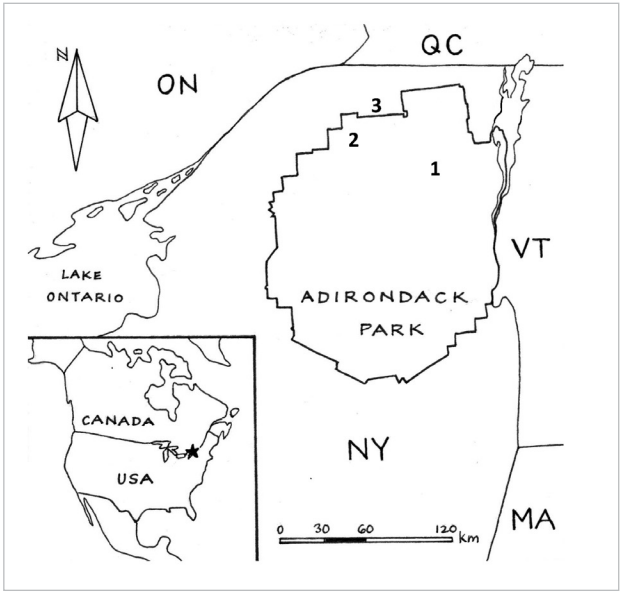

Figure 1. Site map with locations of lakes in which dugouts were discovered.
1. Lake Placid.
2. Lake Ozonia.
3. Twin Ponds.
Inset: star indicates the Adirondack region.

We recorded the dimensions of each dugout and examined the surfaces of the wood to document marks left by tools that could provide insights into the kinds of tools that were used to create them, which in turn yielded additional information about their likely age. Prior to contact with Europeans, Indigenous dugout-makers of the region used implements made of stone, bone, or shell to pound, chip, or scrape wood loose from the trunk of a log, usually with the aid of fire that charred the wood and made it easier to excise.

With the spread of European metal tool technology in the region from trappers, traders and missionaries around the late 16th to early 17th centuries (Otis, 2018) working the wood no longer required the use of fire to vaporize and weaken the material for chopping. Both stone and metal tools leave distinctive marks on wood that can be visually distinguished from one another. The marks left by sharp-edged metal tools such as axes, adzes, or chisels are typically more linear, narrower, and often more deeply incised with a V-shaped apex in comparison to those made by stone versions of those tools (Greenfield, 1999), and they are more likely to cut directly across the grain of the wood (Figure 2). The presence of distinctive cut-marks, therefore, indicates that the maker did not use traditional Indigenous tools and that the dugout probably dates to the Colonial period or later (i.e. less than five centuries old).

In addition to providing basic descriptions of the features and ages of these four dugouts we also include notes on an additional dugout from a lake at lower elevation and briefly discuss the sparsely documented history, uses, and significance of pre-20th century watercraft in the Adirondacks. We hope that this information proves useful to scholars and will be of interest to anyone who shares our fascination with the deep human history of this region.

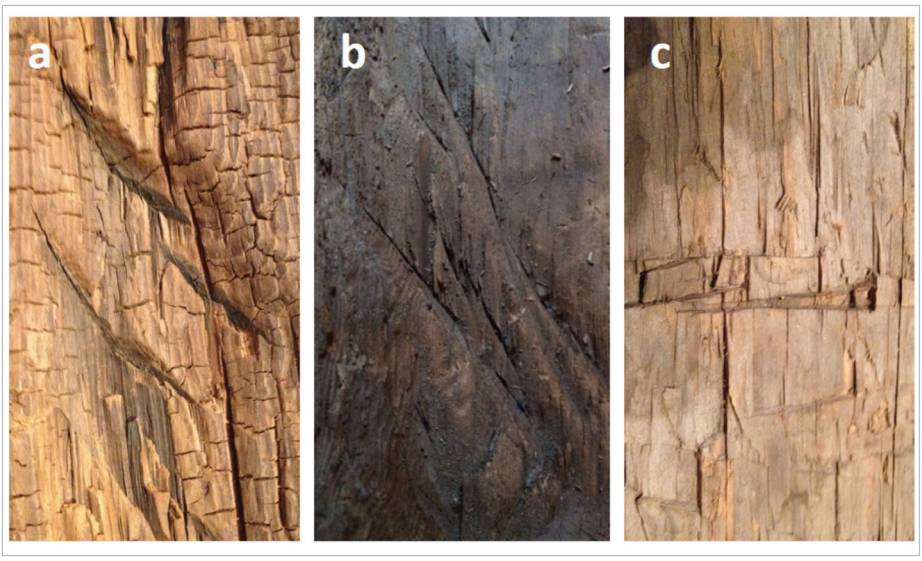

Figure 2. Evidence of cutting across the grain of the wood with metal tools. a. Lake Ozonia dugout. b,c. Lake Placid dugout.

1. LAKE PLACID DUGOUT

Location: 44°18'31"N, 73°59'00"W, ca. 564 m elevation
Dimensions: length 3.8 m, width 0.61 m, depth 47 cm at stern to 15 cm at bow.

The Lake Placid dugout was discovered ca. 1960 by timber salvage diver James Blackmore while SCUBA diving in 3-5 m of water between Brewster Point and the southeastern corner of Buck Island (James Blackmore and Mark Wilson, pers. comm. 2014). The boat was sold to Ray Fadden, founder of the Six Nations Iroquois Cultural Center in Onchiota, and has been on display at the center since then. The dugout was carved from a white-cedar trunk in a manner that left cut marks indicative of metal tools and it shows no sign of extensive charring. Both ends were rounded, but the presumed stern is higher than the bow and has a raised platform (Figure 3). The gunwales become higher toward the rear as if the boat were intended to tip upward with a seated paddler, but they could have protected the interior from getting wet only under the calmest conditions.

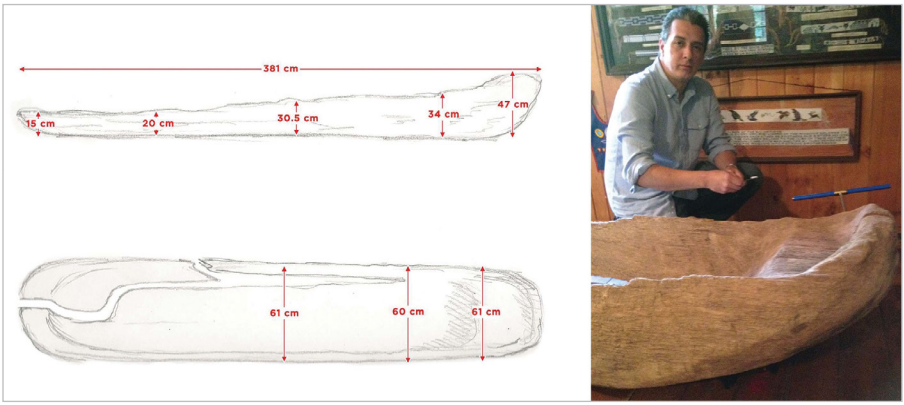

Figure 3. Lake Placid dugout. Dimensions indicated with the presumed bow to the left and stern to the right. Photograph shows David Fadden with the increment borer beside the sampling location on the right side of the stern.

A sample of wood was taken from the stern by JCS and DF with an increment borer for radiocarbon dating in July, 2014. The innermost portion of the sample yielded a radiocarbon age of 140 +/- 30 years before present ("BP," typically used in reference to the year 1950; Table 1), which corresponds to a 2-sigma calibrated age range of AD 1671-1944 when analyzed with the CALIB v. 8.2 program (Stuiver et al., 2022). The median likely age was AD 1822 but the time frame with the maximum probability was AD 1671-1768 (Table 1). In light of the evidence for the use of metal tools and the recent radiometric age, we surmise that the Lake Placid dugout was most likely carved during the late 17th to mid-18th century.

2. LAKE OZONIA DUGOUT

Location: 44°36'00"N, 74°37'00"W, ca. 421 m elevation
Dimensions: length 4.3 m, width 0.53 m, depth 40 cm at stern to 20 cm at bow.

The Lake Ozonia dugout was discovered in 1957 by several youngsters who were swimming near the shore. Everett Smith, one of the youngsters, later recalled seeing it on the bottom while snorkeling in roughly 3-4 meters of water near the Cubley family camp on the north end of the lake (Smith pers. comm., 2014). The boat was crafted from a conifer trunk, possibly white-cedar, and was weighted down with stones when discovered. The bow has a triangular shape when viewed from above and from the side with a slightly raised rim, and the stern is rounded and angled upward (Figure 4 a,c,d). The gunwales are low and unlikely to have prevented water from entering the craft when in use. Linear incisions spaced regularly along the length of the floor appear to represent axe-cuts used to facilitate the chipping away of wood between them (Figure 4 b).

When examined by JCS in 2014, much of the wood displayed a checkerboard pattern of quadrangular cracks that superficially resembled signs of combustion that might be the reason why an associated interpretive sign mentioned that "...a combination of edge tools and fire" was used to shape the log. However, the lack of darkening or remnant charcoal makes decay an alternative cause of the geometric cracking pattern which can also be seen in decomposing logs in the forest. The light color of the wood also contrasted sharply with an obviously charred patch 15 cm in diameter that was present on the right side of the floor of the dugout near the bow (Figure 4 a,d), and a more diffuse charred patch was located midway along the floor of the craft.

For some years the dugout was on public display at the Adirondack Experience (formerly known as The Adirondack Museum; accession number 58.350.1) accompanied by a sign that gave it a date of AD 1344-1504 which would make it the region's oldest known boat. Our findings, however, challenge that presumed age. The age range that the museum provided was based upon a radiocarbon date of 570 +/- 80 years BP that was obtained for a splinter of exterior wood by the now-defunct Teledyne laboratory. When subjected to the latest version of the CALIB dating program (Stuiver et al., 2022) it yields a 2-sigma calibrated age range of AD 1277-1458 with a median likely age of AD 1364. However, cut-marks that are clearly produced by metal tools are common on the floor and elsewhere on the exterior (Figures 2, 4 b), which makes it extremely unlikely that the dugout is more than 500 years old.

JCS collected an increment core from the stern in August, 2014, the innermost portion of which provided a radiocarbon age of 200 +/- 30 years BP (Beta-445470) corresponding to a potential 2-sigma calibrated age range of AD 1644-1950. The time frame with the greatest probability is AD 1725-1811 and the median likely age is AD 1767. Unlike the Teledyne date this entire age range is more consistent with the evidence for working by metal tools.

Because of the large discrepancy between these radiometric ages JCS contacted experienced senior staff at Beta Analytic, one of the world's most reputable radiocarbon dating services, to discuss possible explanations for it. The Beta Analytic scientists pointed out that the Teledyne dating laboratory had been open for business over a relatively short period and records of its former operations are not available. However, these individuals recalled that the Teledyne technicians had based their age calculations on a half-life for radiocarbon decay that has since been updated, that they did not regularly attend the

professional conferences that more established labs rely upon to maintain data quality and keep up with advances in the field, and that peers had suspected that Teledyne's dating equipment was not always properly calibrated.

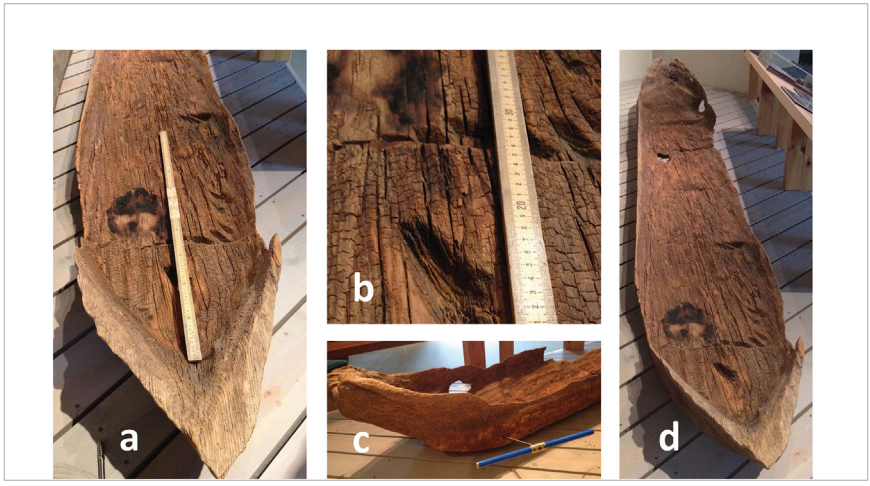

Figure 4. Lake Ozonia dugout. The darkened patch on the floor near the bow (a,d) represents charring, possibly by a small fire used during fishing or hunting at night (see text). Deep cut marks across the grain of the wood (d) suggest working with metal tools.

In combination with the younger radiometric age from Beta Analytic and signs of metal tool use, the weight of evidence strongly suggests that the older date provided by Teledyne was incorrect and that the Lake Ozonia dugout is most likely only two or three centuries old.

3. TWIN PONDS DUGOUTS

Location: 44°42'54"N, 74°20'50"W, ca. 440 m elevation

Two dugout canoes were discovered at Twin Ponds near Duane Center in 1984 (Kenny 1995) during a dredging operation that the landowner had instigated as part of a development plan on the property. The outlet had been dammed in order to deepen and enlarge the ponds, which caused marshy deposits near the northern outlet to detach from the bottom and begin to float, so a backhoe and barge were employed to cut into the peaty material in an effort to open channels in it for navigation. Jerry Bottcher, owner of the Hungry Trout Resort in Wilmington, NY, later recalled the moment when the backhoe operator's bucket hoisted a long, dark object from the deposit (Bottcher pers. comm., 2014). "I heard him shout an expletive," he said, "and there it was." Further dredging later uncovered a much larger dugout as well (Dugout #2; Figure 6).

The watercraft were uncovered on private property and have since been kept in a private residence in Jay, NY. We obtained permission to examine both boats from owner Barry Silverstein in 2014 and to collect increment borings from each for radiocarbon dating. Both dugouts are dark brown in color due to charring and free of any evidence of cut marks from metal tools. Both were recently coated with shellac that did not cause the dark coloration, as indicated by splintered areas that had exposed lighter shellac-coated wood beneath the darkened outer layer. We were unable to definitively identify the species of wood in either craft beyond the level of "conifer."

Twin Ponds Dugout #1 dimensions: length 3.75 m, width 0.47 m, depth up to 38 cm at the presumed stern

Figure 5. Twin Ponds Dugout #1. Note the dark color due to charring and the lumpy surface textures (a) that suggest working with relatively blunt implements made of stone rather than metal.

The surface of the wood is irregular with variable degrees of charring. Both ends are notably thickened and encompass an upward-facing semicircular pattern of growth rings that appear to represent about half the diameter of the original log (Figure 5). Gunwales are minimal in height along most of the length of the craft. An increment core 9 cm long was taken from the outer left side of the thicker end, encompassing ca. 40 growth rings. The innermost portion of the sample yielded a radiocarbon age of 200 +/- 30 yr BP, a most probable calibrated age range in the latter half of the 17th century, and a median age of AD 1767 (Table 1).

Twin Ponds Dugout #2 dimensions: length 6 m, width at center 0.63 m, depth up to 25 cm at the presumed stern

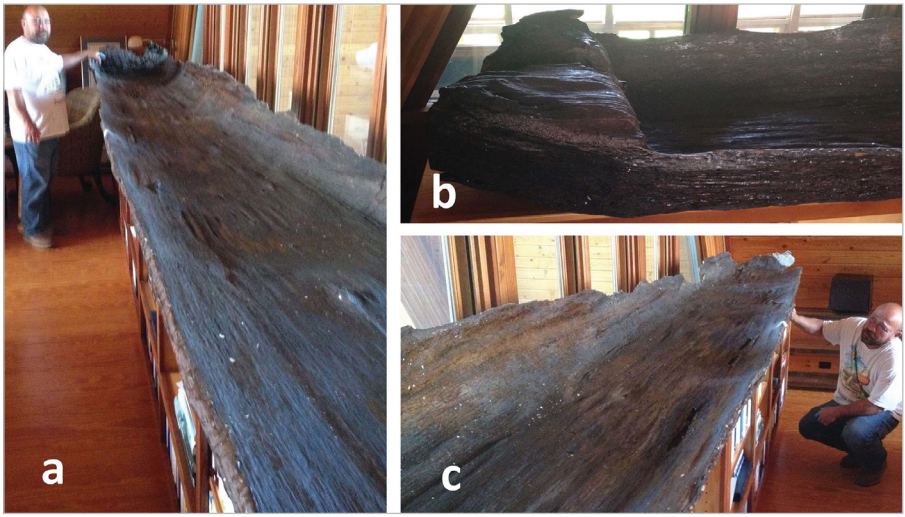

Figure 6. Twin Ponds Dugout #2. As in Dugout #1 (Figure 5), the dark color indicates charring and the lumpy texture suggests working with relatively blunt tools.

The surface of the wood is irregular with abundant knots and variable degrees of charring. One end is much thicker and encompasses roughly 100 growth rings in an upward-facing semicircular pattern that represents about half the width of the original log (Figure 6). The other end, presumably the bow, is narrow and flat. Gunwales are minimal to absent. An increment core was taken from the outer right side of the thicker end, encompassing ca. 90 growth rings. The innermost portion of the sample yielded a radiocarbon age of 260 +/- 30 yr BP, a most probable calibrated age range in the mid-17th century, and a median age of AD 1645 (Table 1).

DISCUSSION

Although lightweight canoes covered with birch or elm bark were commonly used on rivers and lakes by Indigenous residents of the North Country in AD 1535 when Jacques Cartier described them (Adney and Chapelle, 2014) and well into the 19th century (Wardner, 2010), dugouts were also convenient modes of transport throughout North America for thousands of years (Wheeler et al., 2003; Andra-Warner, 2019).

A painting by Winslow Homer titled "The Trapper" (1870) demonstrates that non-native residents and visitors to the Adirondacks also used dugouts during the mid-1800s if not earlier. Although too heavy and unwieldy to be used for most river travel into and out of the uplands, dugouts were nonetheless convenient in other ways because of their durability, ability to float despite holes or cracks, and relative simplicity of construction particularly when the wood was softened by decay and therefore easier to sculpt and/or burn. It is likely that the dugouts described here were built, used, and stored underwater or onshore at the lakes within which they were eventually found.

We can only speculate about the uses of these watercraft. Their low profiles make it likely that their floors and their users were commonly wet, so they probably served as platforms for hunting, trapping, and fishing or simply for crossing a lake rather than as a means of transporting cargo, furs, or war parties over long distances as has been imagined previously (Kenny, 1995). The Lake Ozonia dugout, for example, bears two charred patches that might have been left by small fires used for jack-light hunting or fishing at night (Otis, 2018), and the location of the Lake Placid dugout's resting place on the lake bottom suggests that it might have been used to cross the narrow channel between the mainland and a large island (Buck Island).

LOCATION	14C AGE YEAR BEFORE 1950	CALIBRATED AGES A.D. (*PROBABILITY*)	MEDIAN AGE A.D.	LAB # (BETA)
Lake Ozonia	200+/-30	1644-1694 ***(0.367)***	1767	445470
		1725-1811 *(0.022)*		
		1874-1876 *(0.003)*		
		1917-1950 *(0.171)*		
Lake Placid	140 +/- 30	1671-1768 ***(0.367)***	1822	386173
		1770-1779 *(0.022)*		
		1798-1827 *(0.115)*		
		1829-1900 *(0.316)*		
		1903-1944 *(0.180)*		
Twin Ponds #1	200 +/-30	1644-1694 ***(0.367)***	1767	390190
		1725-1811 *(0.022)*		
		1874-1876 *(0.003)*		
		1917-1950 *(0.171)*		
Twin Ponds #2	260+/-30	1518-1590 *(0.302)*	1645	390189
		1620-1672 ***(0.543)***		
		1766-1772 *(0.007)*		
		1778-1798 *(0.134)*		
		1942-1950 *(0.015)*		
Daggett Pond	200 +/-30	1644-1694 ***(0.367)***	1767	388218
		1725-1811 *(0.022)*		
		1874-1876 *(0.003)*		
		1917-1950 *(0.171)*		

Table 1. Dimensions and radiocarbon ages of Adirondack dugouts. The calibrated age ranges (2-sigma) were determined with the CALIB program v. 8.2 using the IntCal20 dataset (Reimer et al. 2020). The most likely age ranges are indicated in bold font.

The sheer size of Twin Ponds Dugout #2 makes its function more of a mystery. The outlet stream is far too small to accommodate such a large boat and the 6-meter long bulk makes it too heavy to carry overland especially when water-soaked. Why create such an enormous craft for use on a pond less than one kilometer wide? We may never know, but possibilities are limited only by the imagination. Perhaps the

original log was already split by lightning or wind and therefore relatively easy to shape, perhaps it served as a swimming or fishing platform for a family, or perhaps the sculptor(s) simply found it entertaining to create such a monster.

The Twin Ponds dugouts are the only ones known thus far from the Adirondack uplands that were made with fire and non-metallic tools and are therefore almost certainly constructed by Indigenous people. The Lake Ozonia and Lake Placid dugouts were made with sharp metal tools that made extensive charring unnecessary, which means that the ethnicity of their makers is more difficult to ascertain. One possible clue is the clustering of the most likely age ranges of all of these craft within the 17th century, a time frame that is also consistent with the age of a dugout from Daggett Pond on the southeastern fringe of the Adirondacks (Table 1) that was sampled by JCS in 2014 and is currently on display at the Rogers Island Visitor Center in Fort Edward, NY. Fur-trapping by Iroquoian, Algonquian, and Euro-American trappers is thought to have greatly reduced beaver populations in the Adirondacks during the 1600s (Terrie, 1993; Otis, 2018), so there was clearly heavy use of upland lakes as centers of operation for fur-harvesting when these dugouts might have served trappers and/or their families. However, the export of such furs from the uplands would have required other means of transport such as lighter bark canoes or foot travel.

Restriction of the ages of these dugouts to the last few centuries raises another question: why have older boats not yet been found in Adirondack upland lakes? One possibility to consider is that only bark canoes were used previously but their more delicate frames and coverings are not as well preserved, which is why the oldest known birchbark canoes in North America date only to the 18th century (Whittle, 2017; Andra-Warner, 2019) although Beothuk peoples of Newfoundland were known to have used bark vessels several centuries earlier (Adney and Chapelle, 2014). We believe this to be an unlikely explanation, however, because dugouts have been used throughout North America for at least 7000 years (Wheeler et al., 2003; Adney and Chapelle, 2014).

Another possibility to consider but reject is that people were not present in the uplands until relatively recently, a false claim that is commonly believed in the North Country thanks in large part to the writings of influential authors such as the banker and amateur historian Alfred L. Donaldson (1921) whose popular accounts of Adirondack history have since been shown to be seriously flawed (MacKenzie, 2007, Stager, 2017). In fact, Indigenous people have lived in the Adirondack uplands throughout the region's post-glacial history (Woods 1994; Lothrop and Bradley, 2012; Stager, 2017; Robinson et al., 2018). The great size and weight of the larger Twin Ponds craft in particular suggests repeated long-term usage on location rather than mere transient travel across the high country. It therefore challenges out-dated claims such as, for example, those made in a recent podcast (Schlimmer, 2022) that Indigenous poeple did not live in the uplands and were "only passing through."

We consider the most likely explanation for the current lack of older dugouts on record in the Adirondacks to be that they have simply not been discovered yet. Lakes in the Adirondack Park are generally protected from draining and heavy salvage operations by regulatory agencies such as the New York State Department of Environmental Conservation and Adirondack Park Agency, so ready access to the region's lake beds is greatly restricted. The surface levels of many Adirondack water bodies including Lake Placid, Lake Ozonia, and Twin Ponds have been artificially raised by dams since the mid-19th century, making it even more difficult to detect ancient watercraft on the bottom through the relatively murky, tannin-stained waters

found in most of our upland lakes. Furthermore, lake levels have risen significantly due to more abundant precipitation during the last six centuries relative to the AD 1000-1400 period (Stager et al., 2021) and in more recent decades as well (Stager and Thill, 2010).

Because of this deepening of local lakes, boats that were originally stored conveniently in the shallows are now submerged under deeper waters that make their discovery less likely. Meanwhile, the ongoing accumulation of sediment layers on top of them makes their outlines increasingly difficult to distinguish from sunken logs and will eventually bury them entirely. In combination with the work of decay-microbes, these processes are slowly drawing a curtain across our view of Adirondack history, and the dugout canoes described here might well be among the last of our windows on the deep story of watercraft in the region.

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