

# Toward a Material History of Watercraft

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## Abstract

This article explores the application of material culture theory and methodology to the study of historic small craft. Following a literature review of selected works of watercraft history and the fundamental characteristics of a material culture approach, two examples are given. Both are drawn from the late nineteenth century, a time when recreational boating began to be a major social and economic phenomenon in North America. The growth in popularity of the canoe as a vehicle of leisure instead of work took place within this context. Theoretical categories of workmanship are first applied to the development of Canadian canoe building techniques. Following this, two sailing canoes, designed and constructed some 30 years apart, are analysed in detail to show how they are differing responses to the same abstract design question of how to fit a canoe to sail. Finally, the meaning of recreational boats as objects of social consumption and production is considered.

## Résumé

Cet article examine la théorie et la méthodologie de la culture matérielle appliquées à l'étude de petites embarcations historiques. Après avoir fait un examen de documents choisis sur l'histoire des embarcations et les caractéristiques fondamentales d'une approche inspirée de la culture matérielle, l'auteur donne deux exemples, tous deux tirés de la fin du XIX<sup>e</sup> siècle, une époque à laquelle la navigation de plaisance est devenue un phénomène social et économique important en Amérique du Nord. La popularité croissante du canot comme objet de loisir plutôt que de travail s'inscrivait dans ce contexte. L'auteur explique d'abord les théories sous-jacentes des techniques de construction du canot canadien. Ensuite, il analyse en détail deux canots à voile, conçus et construits à quelque trente ans d'intervalle, pour montrer comment ils rejoignent par des chemins différents la notion de la voile fixée à un canot. Enfin, l'auteur étudie la signification des embarcations de plaisance en tant qu'objets de consommation et de production sociales.

In a recent article in *The William and Mary Quarterly* entitled "Beyond Jack Tar," historian Daniel Vickers made several pertinent observations about the writing of maritime history. There is, he said, a gap between popular maritime history and the work of academic historians; maritime history lacks a "well-defined body of... theory around which research and debate might be organized;" and finally, some of the seminal works of maritime history "were fundamentally celebrations and not analyses."<sup>1</sup>

Each of these comments is telling, and worthy of extended debate on its own. However, it is the second of these, regarding the role of theory in maritime history, that I would like to address in this article by exploring the applica-

tion of material culture theory and method to the study of historic watercraft.

One of the fundamental texts for the student of historic watercraft in North America is Howard I. Chapelle's *American Small Sailing Craft*.<sup>2</sup> First published in 1951, Chapelle's work was the result, the author said, of a "self-educational project to explore the 'art' of small boat design." His purpose in writing the book was distinctly practical. Dismayed at the trend that yacht design was taking, he sought to reintroduce to the boat-using and boat-building public a number of historic watercraft that he felt were worthy of serious consideration.

Traditional working craft, he maintained, were often highly evolved for particular con-

ditions, while at the same time retaining an inherent wholesomeness and simplicity of construction. As such, they made good choices for those looking for practical, relatively low-cost, able pleasure craft.

Following an initial historical chapter on colonial and early American boats, the book is organized typologically. Chapelle grouped watercraft according to hull types, such as flat or V-bottomed, or according to families of similar, related designs, such as shallops, or sloops and catboats. Each type was illustrated by measured drawings of several examples. These were often the results of extensive primary fieldwork, including interviews with builders and users, and lines and measurements taken from extant hulls and models. With his connoisseur's eye, Chapelle did not hesitate to designate certain models of each form as degenerate or unduly influenced by racing, which he felt invariably diluted the qualities of the workboat origins. His purpose, after all, was to provide people with wholesome, usable boats.

A similar, though much elaborated, classification of boat types had been earlier created by James Hornell, whose *Water Transport: Origins and Early Evolutions* was published in 1946. Hailed by the *Times* of London on his death in 1949 as "probably the greatest living authority on the evolution of water transport," Hornell's approach was Darwinian in its scope. He attempted nothing less than a systematic survey which included virtually every form of watercraft in the world, both ancient and modern.<sup>3</sup>

Though he made his living as a marine biologist, Hornell's approach was typical of that taken by anthropologists, with a strong emphasis on recording, listing and describing variations in form and construction. Like Chapelle, his research was based on extensive fieldwork and on-site documentation. He even classified the tools and equipment of boats, including in his book a two-page aside on bailers. Like Chapelle, though on a global scale, he too was concerned with the diffusion of influences and forms, and with establishing lines of descent through common watercraft families that could link, at some ancestral level, all known forms of boats.

In the completeness of its cataloguing, Hornell's book has yet to be exceeded, and likely never will, since many of the forms that he surveyed in the 1920s and 1930s are now extinct. However, as maritime historian and curator

Basil Greenhill pointed out in his introduction to the reprinted 1970 edition, certain aspects of scholarship have evolved since the book was first published, and so the same historical material could still be made to yield new insights.

Douglas Phillips-Birt's *The Building of Boats* picks up where Hornell left off.<sup>4</sup> Phillips-Birt's perspective is also global on the subject of the history of boatbuilding. Focussing on construction methods as an aid to classifying boat forms, he elaborates on a distinction not given its due in Hornell: that between shell-first and skeleton-first construction. For Phillips-Birt, this is the fundamental, orienting division between watercraft types, and all others have flowed from it. While distinguishing an overall evolutionary progression beginning with the earliest floating devices, he nonetheless also demonstrates how particular construction techniques, far from succeeding one another in the orderly fashion so beloved of chronology or timeline makers, often persisted side by side well into modern times.

No less important a work of watercraft history is Kenneth and Helen Durant's *The Adirondack Guideboat*.<sup>5</sup> Utterly different from the global perspectives of Hornell and Phillips-Birt or the national focus of Chapelle, Durant's book is a detailed and intimate portrait of a distinctive regional watercraft type. Given the long association of Kenneth Durant's family with the Adirondacks, he might be said literally to have had guideboats in his blood.

The book is organized into two main sections, concerning first the origins and context of the guideboat's unique design, and second its construction and use. Much attention is paid to possible origins of the boat's hull form and structure, and to its frame-first, bevelled-lap building method. Extensive lineages of particular guideboat models and their builders are given, together with a lesson in how to use one on the water. One guideboat-builder's shop, that of the Grant family, is inventoried in detail. The ultimate example of the almost obsessive focus on a particular boat is a count of the number of tacks and screws used in a typical Grant guideboat.

Each of these four books is a fundamental text for the student of North American watercraft history. None of them was written by someone who would have been considered a historian in the academic sense of the word, though certainly the authors were of substantial

reputation and some standing in their fields. The Durant and Chapelle books exemplify a strain of writing which proceeds from deep personal knowledge and experience of the subject matter: the Adirondack guideboat for the Durants, and American sailing workboats for Chapelle. Though it may be going too far to level at these volumes Vickers' charge that they celebrate where they should analyse, they are, for the most part, works of straightforward narrative history, without an explicit research methodology, and not products of a particular school of historical understanding. They are books written by expert practitioners who also happened to be writers.

Phillips-Birt and Hornell, regardless of the extent to which they explicitly acknowledge it, are more scientific in their approach. Their global, systematizing, categorizing studies have their methodological roots in enlightenment-era theories of taxonomy and classification that were first applied to the natural world. They endeavour to erect a theoretical framework that can encompass the diversity of examples that they study, and their works at least make a gesture at the closure of an explanatory system. However, in their books, as with the other two, the question of *how* the boat might be studied is largely subsumed in the simple fact that it *should* be studied. The topic is so self-evident, and its attraction so great, that the authors get right down to business and begin with histories that are fundamentally narrative and descriptive, rather than analytical.

This limited literature review should not give the impression that no one is applying material culture methodology to watercraft, however. A notable disciplinary exception is underwater archaeology, particularly in the studies by George Bass. Research has also been carried out, primarily on working craft, by Basil Greenhill, David Taylor and Janet Gilmore.<sup>6</sup>

Only one of the works above, the Durants' guideboat monograph, deals with recreational as opposed to working watercraft. Chapelle's avowed intention was to bring to the reader's attention working watercraft that could also be used for recreation. He and other authors who have come after him have largely succeeded in doing this, re-integrating historic working small craft into the modern world in a practical way. The general level of knowledge about and appreciation of historic small craft has grown tremendously since the early 1970s. However,

historic recreational watercraft themselves have to date not really been subjected to detailed studies of their context and evolution to the same extent as working craft.

Recreational boats should be a fruitful area for material culture study, since their consumption frequently represents discretionary spending relatively unhindered by necessity. They might, therefore, be assumed to be even more representative of the needs and desires of their consumers and users than working craft: a much-desired consumer good is an appropriate way to study how desires are satisfied through artifacts.

### The Material Culture Method

All of these books have in common a focus on the boat as an object, and they seek in their various ways to understand its form and structure. It is, in essence, a material culture approach. Material culture has been called "a preoccupation with the direct evidence offered by the artifact ... and its meaning to particular humans as an expression of need and aspiration."<sup>7</sup> Another prominent material historian has written, "the underlying premise [of material culture] is that objects made or modified by man reflect, consciously or unconsciously, directly or indirectly, the beliefs of the individuals who made, commissioned, purchased or used them, and by extension the beliefs of the larger society to which they belonged."<sup>8</sup>

A material culture approach, by uniting heretofore separate studies of material and culture, has the potential to be a unifying force in watercraft history. For example, the evolution of fishing craft is often studied from a point of view based on naval architecture: Chapelle's famous examination of the evolution of the American fishing schooner considers speed, seaworthiness and carrying capacity as the primary determinants of vessel form.<sup>9</sup> A folklorist, by comparison, may be recording the songs and documenting the dress and houses of fishermen ashore.

The fishermen's boats, however, are nothing if not another element in the coherent and interconnected cultural system of their lives. Though considerations of naval architectural science played a strong part in vessel evolution, their ultimate form was also determined by what fishermen consciously and unconsciously wanted to say with them and through them about their livelihoods, their skills and their place in fishing

culture. An incisive examination by Bill Dunne of the dangerous role fashion and tradition have played in fishing vessel design has recently explored this issue in more detail.<sup>10</sup>

The history of yacht racing and design too shows clearly the need for interconnected examinations: that is, studies that consider both material and culture. The shape of a given racing yacht is a complex amalgam of the influences of rating rules, design theory, style and aesthetic prejudice and opinion. A consideration from any one of those viewpoints alone is insufficient to fully understand the artifact.

Another characteristic of a material culture approach is a tendency toward explicit, schematic research models, which constrain the researcher to take certain steps in a particular order in the encounter with the object of study. This overt methodology can clarify the issues at stake, and help to factor out the researcher's own preconceptions and guide the crucial field-work stage of research.<sup>11</sup> However, as the noted American material culture writer Thomas Schlereth has pointed out, it can also be constraining. Such a methodology might best be seen as only an intermediate point on the way to a "more rigorous, more systematic, more verifiable theory."<sup>12</sup>

A material culture analysis also requires a distinct body of data, containing more than one example of the artifact in question. For the material historian, meaning ultimately arises from an artifact considered not as a masterpiece work of art, in splendid isolation, but in relation to other similar artifacts. This is an echo of material culture's origin in linguistics and an indication of the prevalence of the linguistic metaphor. Since the work of Swiss linguist Ferdinand de Saussure, linguists have located meaning in language not primarily in words or sentences, but in *différence*, the play among words and sentences.<sup>13</sup>

Material historians will often utilize an abstract notion of a particular artifact, such as a chair, as a point of comparison with the real ones under study. This can yield information about: the persistence of certain forms over time; the degree of variation from a norm; the drift and change of style; the arrangement of artifacts into a series; and the interpretation of the results as evidence of cultural conditions or change.<sup>14</sup>

To do so inevitably raises the question of interpretation, however. Material historians have on occasion been criticized for focussing overmuch on how things changed and neglecting to

speculate why, and thereby producing what a colleague recently called "object-oriented interpretive catalogues." Archaeological theorist Christopher Tilley refers to "the deadening verbal and visual catalogue of the empiricist ... text," and shows how, for early archaeologists, identification was synonymous with interpretation.<sup>15</sup> The same can be said of solely descriptive, first-order material culture studies. In order to avoid the charge that the material culture is simply a more sophisticated antiquarianism, it must be possible to use the carefully elaborated results of confrontations with objects as a way to understanding larger social meanings.

In pursuing this, material historians must confront for themselves issues common to other critical interpretive modes: Where are the structures really located that we claim to find in objects? Are stylistic evolutions of a beginning, middle and end, with the climax in the middle, impositions or interpretations? Is Chappelle, for instance, saying more about himself than the watercraft when he speaks of "degenerate" forms?

Archaeologist Ian Hodder, who has written persuasively on issues of material culture theory, maintains that literary forms are a fundamentally human mode of perception. Therefore, when we find beginnings, middles and ends in cultural sequences, it is both an "arbitrary fiction of the observer" and a recognition of inherent structure.<sup>16</sup> For Hodder, uninterpreted research is incomplete research, and he suggests strongly that material culture (and archaeology) must rise above list-making and descriptions of things. For him, the products of interpretation justify the risk of imposing meaning on artifacts.

A material culture approach may be characterized by the following: a recognition of the primacy of the artifact in historical understanding; a belief that artifacts reflect the societies that produced them; an analysis of both the material and culture of an artifact; an explicit research strategy wherein questions are initially addressed directly to artifacts; and a conclusion by the interpretation of data produced in a detailed examination of the artifacts.

In order to explore the application of these principles to watercraft history, I would like to examine a distinct period at the end of the nineteenth century: recreational canoeing, the first of the great popular crazes which were to seize North America at the end of the nineteenth century.



**Fig. 1**  
*Decked sailing canoes of  
 the Toronto Canoe Club  
 at Toronto Island, 1890s.  
 John Colin Forbes's  
 Sailing at Toronto Island.  
 (Courtesy Royal Ontario  
 Museum)*

### Recreational Canoeing

The range of canoe forms is stylistically and geographically vast. This study will consider only canoes made for recreational use by European construction techniques by British, American and Canadian canoeists during the last quarter of the nineteenth century. It will not address craft used primarily for work, such as the Chesapeake Bay log canoe, or aboriginal craft from the larger area of the Americas.

The canoe is an enduring icon of North American and particularly Canadian culture.<sup>17</sup> Long the watercraft of choice for wilderness travellers in the country's early days, its use had declined through the nineteenth century as roads, schooners and steamships made journeys easier. By the last quarter of the nineteenth century, however, the canoe was experiencing a rebirth. The stalwart companion of many a woodland journey had been transformed into a means of recreation and healthful exercise. The North American public was gripped by a great popular enthusiasm for canoes and canoeing. This foreshadowed their later fondness for bicycling.<sup>18</sup>

This rise of recreational canoeing from the mid-1860s was an extraordinary flowering of boating activity. Changing economic circumstances and new social attitudes produced a class of well-heeled sportsmen and adventur-

ers who acted as patrons of high-quality boat-builders. This demand for premium work attracted and fostered an extremely high calibre of boatbuilding, which drew upon rapid advances in technology and mechanization to accomplish its feats.

Two distinct strains emerged early in the development of this mid-nineteenth-century recreational canoe. Both were aboriginal in origin. Although it is too simple a distinction to explain the matter entirely, one can begin by distinguishing among the canoes by whether or not they had a deck. The undecked watercraft which was later to become known, somewhat misleadingly, as the "Canadian" (or "open") canoe had its origin in native birchbark and dugout craft. The main technical contribution of the canoeists and canoe-builders of the recreational era who worked with this model was in the construction techniques, and only secondarily in the designs, which remained relatively unchanged. Some commentators maintain, in fact, that such canoes approached perfection the more closely they adhered to their aboriginal roots.<sup>19</sup>

The other recreational canoe form popularized at this time was the decked canoe. Decked canoes as used for recreation in North America also evolved from native watercraft, but from a more northerly tradition, and by a roundabout



route. It was a retired British Army officer who, in 1865, first married the form of the decked, double-paddle skin canoes or kayaks which he had observed in northern cultures to the European lapstrake boatbuilding tradition.<sup>20</sup> A skilful self-promoter and an ardent writer and traveller, accounts of his cruises soon sparked imitators, and by the late 1860s a canoeing movement was underway in Britain. This was soon exported to the United States, where increased leisure time and wealth, coupled with highly romanticized notions of the beneficial effects of coming into contact with a rapidly-being-tamed wilderness, gave the sport added impetus.

At this time, the two canoe styles, the decked and the open, were subjected to further influences. Human nature asserted itself, and people began not only to paddle their new canoes, but to race them, and argue fiercely about their respective merits. The open, undecked type remained largely a Canadian phenomenon in the early years, while the decked-over British form diverged into paddling and sailing models. When organized canoeing, exemplified by the American-led American Canoe Association, came to Canada, they treated the open Canadian boats as strange and wonderful objects, particularly when the Canadians soundly beat them in several paddling races.

Along with the open vs. decked canoe debate were strongly-held opinions about paddle styles, once again traceable back to the original native sources for the respective designs. Open canoes had traditionally been used with single-blade paddles, and decked boats with double-blade ones. Early racers experimented back and

forth with inconclusive results as far as absolute speed was concerned.

Often (and somewhat misleadingly) described as the "Poor Man's Yacht," the nineteenth-century decked sailing canoe might better be called the "Poor Yachtsman's Yacht," since it offered its adherents, through canoeing, a similar social structure to organized yachting, but at far lower (though still considerable) cost (Fig. 1). Canoe clubs grew rapidly in numbers through the 1870s and 1880s. Most had distinctive burgees, uniforms and sail emblems, which the canoeists called "totems" (Fig. 2). Their dominant ethos was rugged amateurism, an outgrowth of the "Corinthian" movement in yachting. Corinthian yachtsmen crewed and sailed their own craft, instead of employing paid hands. These canoeists frequently referred to themselves by ennobling sobriquets, such as "Knights of the Double Blade" (Fig. 3).

### Canoe Construction and Categories of Workmanship

In his article examining workmanship as evidence in eighteenth-century chairmaking, material historian Phillip Zimmerman distinguished three broad categories of workmanship employed by chairmakers: risk, certainty, and habit. The workmanship of risk is that in which the result is constantly at hazard during the process of making (for instance, with hand carving, where each piece is created anew). The workmanship of certainty is that in which quality is largely pre-determined through the use of moulds and patterns.

In the case of the third category, the workmanship of habit, the product is a relatively uniform object, but its production still requires a high degree of skill. The work is carried out by a mental, as opposed to a physical, template which guides a conditioned response on the part of the worker. For artifacts produced by this kind of workmanship, regional variations in style, technique and execution derive from the re-use of these mental templates by workers being trained in one area and then dispersing.

Workmanship of habit can be further linked to particular economic circumstances. Zimmerman shows how a scarcity of investment capital in eighteenth-century America meant that what limited amounts were available were usually tied up in land or buildings, and therefore could not be spent on expensive tools or

**Fig. 2**  
Members of the Toronto Canoe Club at an American Canoe Association meet, 1880s. (Courtesy Toronto Historical Board)





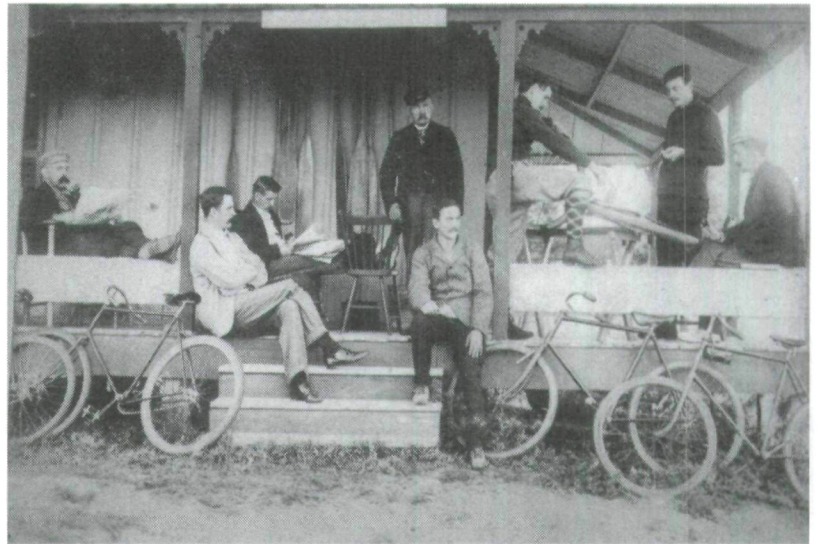
automation of work processes. The skills of the workers took the burden of ensuring the consistency of the finished product. As capital and machinery became available, patterns of workmanship moved away from habit and toward certainty, as more and more of the burden of production quality was borne by machinery.<sup>21</sup>

The applicability of this model to boatbuilding is obvious. As many people discovered to their chagrin during the first stages of the wooden boat revival in the late 1960s and early 1970s, nineteenth-century boatbuilders were not medieval artisans who entered into a spiritual communion with wood as they built their boats. That was the quick way to bankruptcy. What they did was to work on an almost assembly-line system, relying on task specialization and the patterning of parts to produce boats at a relatively rapid pace through handwork of machine-like quality and regularity.

Zimmerman's workmanship paradigms can easily be applied to changing techniques in recreational canoe construction in the last half of the nineteenth century. In the progression from bark and dugout canoes, to wide-board plank boats, to rib and batten, to cedar strip, to canvas-covered, can be seen the same gradual drift in workmanship methods from risk to certainty (Fig. 4). A dugout canoe, chronologically the earliest form, was produced by the workmanship of risk through a process of skilled attrition of the original log, the final form depending almost entirely on the experience and mental template of the worker wielding the adze. The same was true of the patternless bark canoe. Although it was a more complex structure, the mental template guiding the work was still regional and ancestral, and not drawn or otherwise recorded.

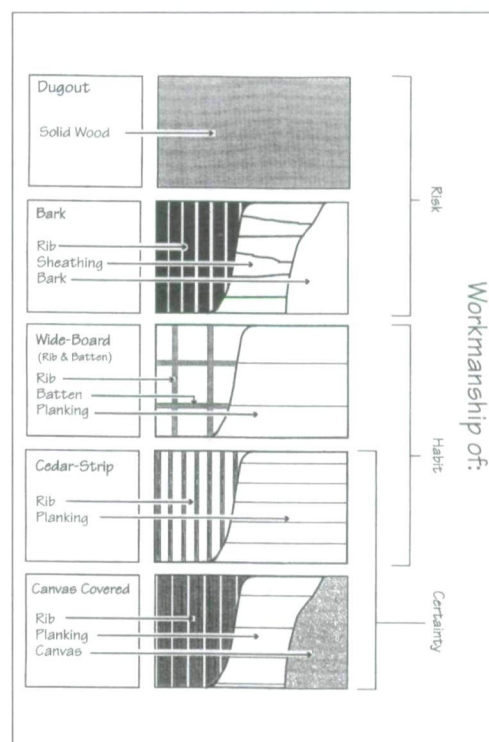
The early recreational canoes built in the mid-nineteenth century, whose forms imitated those of the much older bark and log boats, initially used wide boards of prime lumber, usually three to a side. The success of this kind of canoe hull depended very much on the fit between the planks and the quality of the lumber. Absolute skill in fitting became slightly less important with the rib and batten method, when half-round battens began to be fitted to back up seams for further watertightness. The battens still had to be carefully fitted between each rib, however.

A significant step toward the workmanship of certainty was taken with what Canadians his-



**Fig. 3**  
Toronto Canoe Club members, 1880s. Note both the paddles hanging up and the bicycles in the foreground. (Courtesy Toronto Historical Board)

torically termed a cedar-strip canoe (not to be confused with modern, home-built cedar strip canoes, where the pieces are roughly square in cross-section). Here, the time-consuming and exacting process of spiling planks, a vestige of the canoe's structure that had been retained from much larger craft, was eliminated. In its place was one master plank shape. This was a narrow strip of planking, widest in the middle and tapering equally toward each end that, with



**Fig. 4**  
Canoe construction methods and workmanship categories.

very few exceptions, could be used to plank the entire boat. Now, as well as simply accumulating wood, canoe-builders could prefabricate virtually finished planks, requiring only one master shape per design.

The transition from risk to certainty was completed with the advent of the canvas-covered canoe. Structurally, it looked back to the bark boats, wherein the planking's sole purpose was to support a waterproof skin, and it was therefore only a sheathing over the ribs. In terms of process, however, the loosely-fitted and roughly-sawn plank stock of the canvas-covered canoe, with its use of un-spiled, constant-width planks and many gores and stealers, required the least workmanship of all. No longer did canoe-builders need even the relatively good clear lumber of the cedar strip boats. Combined with the banded metal form, this eliminated two crucial and expensive skills from canoe production: planking could be quickly and roughly fitted, and the tacks which held it to the ribs no longer had to be turned and clinched by working at both sides of the hull. One worker could drive tacks from the outside of the hull, and their points would be turned by the metal bands on the mould. Ironically, some modern canoe-builders, catering to a misplaced enthusiasm for anything which looks "handmade," now produce this type of canvas-covered canoe without its painted canvas, but instead with a clear fibreglass covering. In terms of canoeing history, this is an a-historical joke, somewhat akin to living in a house with no exterior siding, since the planking of a canvas-covered canoe was only a sheathing, and was never meant to be seen from outside the boat.

Of course, none of these changes in workmanship happened in isolation. For the production of recreational canoes, which was so closely tied to the rise of new ideas of leisure and an increase in disposable income, economic pressure on producers was to become particularly acute by the 1890s. Relentless price competition all but ensured that even well-known builders such as the American J.H. Rushton, of Canton, New York, who formerly had made much in their advertising of the quality of their boats, emphasizing the highest grades in each model of canoe, eventually saw their canvas-covered boats, the cheapest to build, eclipse all others in sales.<sup>22</sup>

### Sailing Canoe Design

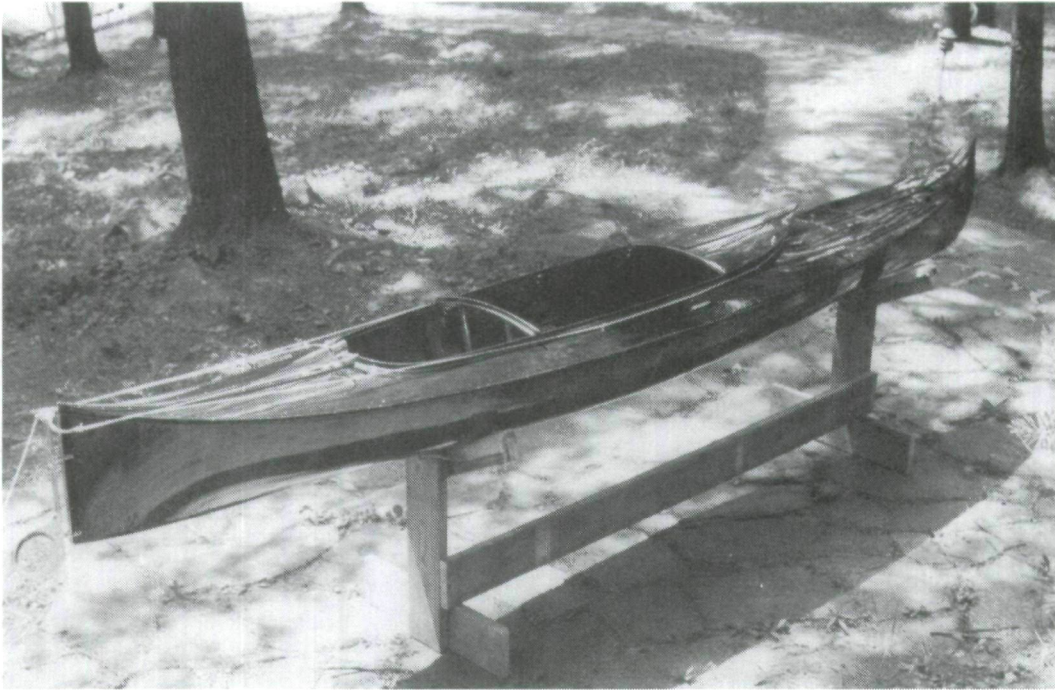
As well as larger questions such as this, a material culture focus can also yield particular insights into the form and structure of artifacts themselves. Often this detailed analysis is a first step in a wider research project, but it can have its own rewards. There will always be a need for accurate, first-order descriptive studies to provide good data for material culture interpretation. To explore this further, I would like to show the results of subjecting two nineteenth-century canoes to a straightforward, first-order material culture analysis.

Between 1883 and 1889, the Ontario Canoe Company of Peterborough, Ontario, produced the decked sailing canoe shown in Fig. 5. Made by a patented process known as "cedar-rib" construction, it is a typical late nineteenth-century decked sailing canoe in all but its hull construction.<sup>23</sup> Early in 1892 the factory of the Ontario Canoe Company was destroyed by fire but later the same year the canoe building operation was re-instituted, this time in Peterborough itself and under the now-familiar name of the Peterborough Canoe Company. The Ontario Canoe Company is most significant for its purchase and use of John Stephenson's two canoe building patents as the basis for its business: one from 1879 for *Stephenson's Rib Boat*, which became popularly known as the "cedar rib" canoe, and the other from 1883 for *Stephenson's Longitudinal Rib Boat*, which may be seen as the technical precursor of what later became the national institution of the so-called cedar-strip canoe already referred to. Purchased from its original owner in the late 1940s, and subsequently owned and stored by members of one family, this canoe is virtually complete and in original condition, except for having been recently refinished.

The canoe in Fig. 6 was made by the Gilbert Motor Boat Company of Brockville, Ontario, sometime between 1910 and 1915. The Gilbert company produced a range of runabouts and autoboats for recreational use on the St. Lawrence River. Apparently one of a number of one-design hulls, the canoe was constructed to the order of the Gananoque Canoe Club to bolster its racing fleet. Designed to compete in the 16' x 30" class, it has a sliding seat, thwartships tiller and two, standing leg o' mutton sails.

In order to examine and compare these boats, I have made use of a familiar material culture research matrix first proposed by Bob Elliot in





**Fig. 5**  
*Ontario Canoe Company  
cedar-rib canoe with one  
hatch cover in place.*

the mid-1980s. In a graduate seminar, a group led by Elliot assembled and evaluated various material culture methodologies, eventually arriving at a synthesis that incorporated the most useful features of several.<sup>24</sup> Their method takes the form of a grid: down the left-hand side are three categories of evidence: 1) observable data, determined through direct physical and sensory contact; 2) comparative data, resulting from comparisons with similar things of a similar time and/or construction; and 3) supplementary data, including written or printed sources, oral evidence, photographs, paintings, and drawings. These three classes of data move progressively further from the thing itself, beginning with a restricted view and gradually re-establishing the artifact in a broader context. The value of this material culture method derives mainly from the first two categories of evidence, which might otherwise be omitted if a researcher went straight to conventional sources. To gather these necessitates direct physical and personal contact with the artifact, and it precludes working only from a photograph, illustration or written description.

Along the top of the grid are five categories of questions to be directed at the artifact, each answered in turn through one of the three kinds of data: material, construction, provenance, function and value. If the method is to produce useful results, a certain rigour in the applica-

tion of the categories is called for, together with a willingness to exclude supplementary and comparative data from the first phase of examination. What this grid produces is in essence field notes which can be refined and expanded later.

When these two canoes were assessed using this method, several useful points of comparison were brought out. The Ontario Canoe Company boat is a high-prestige, value-added artifact, a deliberate display of virtuoso crafts-manship. It is constructed of rabbetted cedar strips 1 1/2" wide, which run from gunwale to gunwale. For most of the boat, they are continuous, but near the stem and stern, where the hull becomes sharper, they terminate at the keel on each side. The only other interior structural members are four, light, longitudinal stringers and a keel, which also houses the folding centreboard. This canoe's shape, with the plumb stem and almost gothic peak to the sheer at the bow and stern, is taken from earlier dugout and bark boats in the Peterborough area, and is quite different from the more conventional recurve or tumblehome canoe stem.

There is no overriding structural reason for this cedar-rib building method: it is not particularly lightweight; it does not seem to be leak-proof, since it greatly multiplies the number of seams underwater; and it is no stronger, and possibly less so, than more conventional wide or



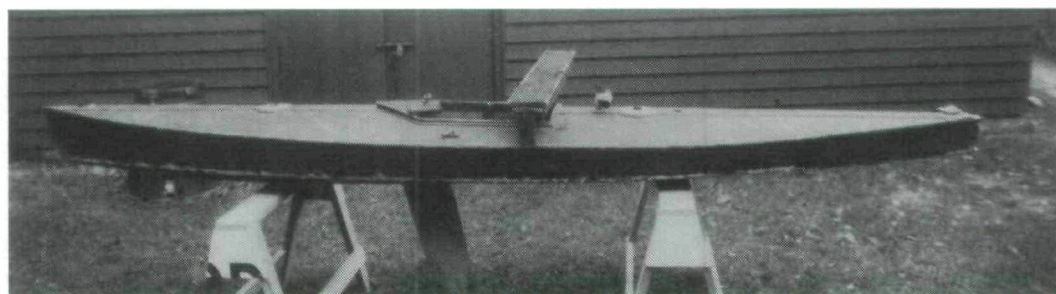
narrow board construction with the planks running longitudinally. The Ontario Canoe Company claimed, however, that it was less prone to leaks, perhaps because the rabbetted seams between the planks outweighed the increased number of seams. The principal reasons for cedar-rib construction are likely located elsewhere than in the interests of the advancement of naval architecture. This is a market-driven boat, emblematic of the class of customer to whom it was being sold. The construction method was utilized in part simply to prove that it could be done, and to provide a visually distinctive, premium product, for which a high price could be charged.

The Gilbert Motor Boat Company canoe is a different matter entirely. Its shape is a-histori-

of activities, including racing, social sailing and extensive cruising. It is fitted with a folding, Radix-brand centreboard, a drop rudder, two break-apart double-blade paddles, and separate sailing and paddling backrests. As would be expected on a top-of-the-line boat such as this, the quality of the gear is high, including elaborate escutcheon plates around the mast tubes and four fitted wooden hatches which can be locked in place to cover the cockpit completely. If one were to quantify its uses, it might be divided into equal parts for cruising, day-sailing and racing. The deck-mounted tiller would allow for sailing from the side-deck, though rudder lines were also fitted for sailing below in the cruising position as well.

In front of the seatback is a shaped mahogany

**Fig. 6**  
Gilbert Motor Boat  
Company canoe,  
showing sliding seat and  
footwell. The bow is  
toward the left.



cal in canoeing terms, formed mainly by function and bearing only an incidental relation to canoeing history, either aboriginal or European. It is also constructed of cedar, though in wide, thin planks. The hard chine hull is made with a sheer clamp, a chine log and a keel, and the bottom, side and deck planks are in one piece. The interior workmanship is quite delicate in its scantlings. Small frames are laid on the planking between sheer and chine, and between chine and keel. These are joined over the chine log with a notched knee. Over the keel, the frame heels are joined with a floor timber of the same siding as the chine knee. The frame heels are staggered so that one falls on the forward and one on the after face of each floor. It is, in fact, conventional V-bottomed runabout construction, though on a small and delicate scale, and reflects the fact that the canoe was built by a company whose primary business was motor boats.

The Ontario Canoe Company canoe is typical of boats used by members of the American Canoe Association and other groups for a range

board that extends across the cockpit. Constructed from a single plank, it is slightly wider than the canoe's beam, with rounded ends and a relieved after side. At each end are vertical members with bevelled ends. I would interpret this to be a hiking board (as distinct from a sliding seat). It is unclear from the existing hardware marks on the boat whether it was permanently fixed in place or demountable. The relieved after side would have allowed the skipper to move from the belowdecks position to the hiking board and back again.

Its purpose, of course, is to gain additional leverage for the skipper's weight and, with it, additional sail-carrying power. In this simple wooden fitting is the beginning of a rapid, racing-driven evolutionary process that would culminate, in the first quarter of the twentieth century, in an entirely new form of sailing canoe.

The open canoeing tradition was to remain primarily a paddling one, though there were those who adapted the boats for sail. Decked canoes attracted the greatest attention from the sailing racing fraternity, however, and hence

were subjected to intense research and development pressure in the search for speed. An early distinction was evident between British and American decked sailing canoes: the British ones were more heavily built and ballasted, often more like small yachts than canoes, while the American boats were more lightly constructed and less burdensome. In part, this reflected their prevailing sailing conditions: British canoeists often sailed in the open ocean or such areas as the Baltic, while American canoeing was largely done on inland lakes and in bays and harbours.

The first sailing contest between racing canoeists of the two countries in 1886 resulted, not surprisingly, in a decisive victory for the lighter American boats, and design fashion swung in this direction. Rather than ballast the boat down and achieve stability and sail-carrying power through hull shape, the Americans instead utilized leverage, in the form of the crew's weight. Canoe sailors began by moving off the bottom of the boat and sitting on the cockpit edge. However, it was not long before someone hoisted himself even further to windward by means of a plank seat such as can be seen on the Ontario Canoe Company boat.

The effects of this search for leverage with live ballast can clearly be seen in the other canoe under consideration. If the OCC boat is designed in equal measures for racing, cruising and day-sailing, the function of the Gilbert boat might be assessed, by comparison, as 80 per cent racing, 20 per cent daysailing and 0 per cent cruising. Features not needed for racing success have become vestigial or have disappeared altogether. The rig is a standing leg o' mutton, with no possibility of being reefed or lowered while underway. The cockpit has shrunk to a self-bailing footwell, and the only sailing position is on deck. The folding centreboard has been replaced with a daggerboard, interestingly similar to those found on windsurfers today, which can be adjusted fore and aft in its slot for trim. The short, fixed hiking board of the OCC boat has turned into a full-blown sliding seat, extending several feet beyond the gunwale. The short deck tiller has been changed to a thwartships model to accommodate the outboard sailing position.

Thus one boat is a market- and customer-driven premium product, designed to appeal to taste and a particular aesthetic of canoe design, having strong formal links to historic canoe forms. The other is a rational, minimalist and a-

historical exercise reflecting the forced evolution caused by racing and consequences of the sailing canoeist's perennial search for sail-carrying power through leverage. Both, however, have in common their origin in a single abstract idea: a canoe fitted to carry sail.

However logical an evolution this was, it was also ultimately to be one of the causes of the decline of canoeing as a popular sport. The use of the sliding seat caused a design transition from multi-purpose boats of wide popular appeal which could be raced, cruised or sailed for recreation, to those so highly refined that they almost would not remain upright when at rest without the counterbalancing of the wind and the skipper's weight. As has happened so often since, the pernicious effect of racing, with its intense evolutionary pressure and its propensity for rule-beating at the expense of form, refined the type almost out of existence, turning it from a useful watercraft to a sail-assisted torpedo. One dismayed canoeist, concerned at the direction his sport was taking, complained to the editor of the influential American sporting journal *Forest and Stream* in 1897 that these sliding seat boats had become "fearful and wonderful machines ... and of no use whatsoever except for a few days' racing at the meet."<sup>25</sup>

The forms of these turn-of-the-century canoes were ultimately shaped by both the social and technical needs of their users. Early multi-purpose cruising boats such as the Ontario Canoe Company canoe reflected the high social status of organized canoeing, and its closed and focussed structure of clubs, organizations and symbols. Exclusive by virtue of their price and the skills required to use them, the canoeists' boats also situated them in canoeing history, being modernized versions of their (noble) "savagery" predecessors. These elegant and well-built wooden artifacts allowed for an outdoor experience which sent strong signals about their users' character and relationship to an idealized natural world.

It was not long before the uplifting influences that led to the formation of many canoeing clubs were affected by the racing impulse, however. Comments soon began to appear in canoeing publications about the "true" nature of the sport, the need for Corinthian sportsmanship, and the dangerous influence of racing. When a strict physical logic of leverage, weight and sail area was applied to sailing canoes within the arbitrary limits of racing classes, design evolution



occurred rapidly. Functions that were not highly valued, such as cruising, travelling and all-round use, quickly disappeared from canoe design.

The original multi-purpose style of boat diverged rapidly into two distinct forms: a stable open canoe that anyone could enjoy; and a decked racing boat that few had the skills or inclination to use. A single original design that had been positioned roughly in the middle of a design scale thus diverged into two opposed tendencies that occupied either end of a spectrum of uses. For other sports such as yacht racing, such a design polarization has historically been corrected by changing the applicable rating rules and formulae to start anew. For large-scale organized canoeing at the end of the nineteenth century, however, this split was fatal. Quickly losing its audience to bicycling, the two divergent forms of the recreational canoe were taken to either the cottage or the race-course, and the middle, popular ground of multi-purpose boats upon which the American Canoe Association had been founded was largely abandoned.

As we move toward writing a material history of watercraft, several things will need to be done. Significant bodies of data need to be recorded to enable detailed descriptions and

comparisons at the level of individual artifacts. More so than any other area of maritime history, an understanding of the development of watercraft is dependent upon consistent, high-quality boat documentation. Photographs, archival sources and written descriptions simply do not suffice. The more of this data that is assembled, the better the analytical structure that can later be erected upon it. The taxonomic, systematic natural science model is not an inappropriate place to look for guidance. In the present state of research, there is an acute need for more first-order, descriptive studies.

Though many museums may have only a few small craft in their collections, the aggregate of those holdings can be a powerful tool for understanding maritime history. We also require more histories of specific watercraft types to be written. Each significant regional or national type calls for its own Kenneth Durant to record its history. We also need more of the boat anthropologists, to keep the large view in mind. All of this activity should also be extended to contemporary collecting. Who, for instance, is now writing the anthropology of windsurfing and sailboard design and use, or "personal watercraft," and examining those watercraft forms as expressions of culture?

#### GLOSSARY

*Batten, rib and batten:* A batten is a small piece of wood which backs up a seam in the planking on the inside. Rib and batten canoe construction used ribs and battens of the same size stock, with the battens interrupted by the ribs.

*Burdensome:* A hull of larger volume and hence heavier displacement.

*Chine, chine log:* The chine is the angle where the bottom of a boat meets the side. A chine log is a timber fitted at that intersection.

*Daggerboard:* A means of providing lateral plane. A daggerboard slides vertically in a trunk, unlike a centreboard, which pivots on a bolt.

*Floor timber:* Here, a short piece joining the heels of the boat's frames over the keel.

*Gores, stealers:* Short, angled pieces of planking fitted in the angles between longer planks.

*Leg o' mutton:* A triangular fore-and-aft sail, relatively long on the boom for its height.

*Rabbett:* A step-shaped channel cut along the edge of a piece of wood to match a similar edge cut on the adjoining one.

*Scantlings:* The dimensions of the parts which go into a boat's hull.

*Shell-first, skeleton-first:* The two principal methods of ship and boat construction. In shell-first construction, planks are first joined, and the internal framing added later. In skeleton-first, the frames are erected and then covered with planks.

*Sheer, sheer clamp:* The sheer is the top edge of a boat's hull when viewed from the side. A sheer clamp is a timber on the inside of the hull at this point.

*Siding:* A boatbuilder's term for the width of a piece. Moulding measures its depth.

*Spiling:* A method of taking measurements from a plank on the hull in order to fit the next one.

*Stem:* The foremost timber in a boat, to which the planking is fastened.

*Thwartships*: Across the beam of a boat, at right angles to its longitudinal axis.

*Tumblehome*: When a hull is viewed in cross-section, it is said to have tumblehome if the sides incline inward from the vertical at the top.

#### NOTES

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