



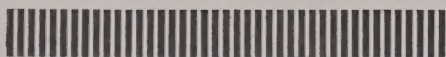
messing about in BOATS

Twice a Month!

Volume 8 - Number 20

March 1, 1991





messing about in BOATS

PUBLISHED TWICE A MONTH, 24
ISSUES A YEAR. SUBSCRIPTION
PRICE IS \$20 FOR 24 ISSUES.

ADDRESS: 29 BURLEY ST.
WENHAM, MA 01984
TEL. (508) 774-0906
PUBLISHER & EDITOR: BOB HICKS



Our Next Issue...

Will take a look at maritime preservation again, this time the grass roots campaign of the tiny Essex Shipbuilding Museum in Essex, Massachusetts, to bring home the hulk of the fishing schooner "Evelina M. Goulart" to become an exhibit of how thousands of now gone "Gloucestermen" were built right there in that community. Mel Ross will take us sailing off Thailand; Bill Robinson entertains us with some paddling stories; Ernie Cassidy returns with Part II of his story about Art Burridge's "Elver". I'll report on Barry Buchanan's Caribou sea kayak, and Dock Shuter tells us about the "Evolution of Super Tender".

On the Cover...

Jim Dina and his birch bark canoe, built with stone age tools and indigenous raw materials from Connecticut woodlands, present a triumph of not only boatbuilding, but also of historical human relationships with the natural environment. We feature extensive excerpts from his book about it, "The Voyage of the Ant", in this issue.

Commentary

BOB
HICKS

I devoted an awful lot of space in this issue to excerpts from Jim Dina's book, "The Voyage of the Ant". The same lengthy review appeared in "Wooden Canoe", which I now publish for the Wooden Canoe Heritage Association, but I felt it was germane to the interests of small boat folks other than traditional canoeists. My friend Dan Marcus loaned me the book with strong recommendations and I was totally absorbed once I got into it. The portions excerpted in this issue are those concerned with how Jim Dina went about building a birch bark canoe the way the indigenous Indians did before the arrival of the European and his steel tools. But the book also chronicles Jim's voyage up the Connecticut river over two summers, an attempt to recapture how it must have been for those Indians, despite the inescapable intrusions of today's civilization on this ancient waterway.

The underlying theme of the book is ethnological, as Jim conceives of a desire to discover how the original inhabitants of the Connecticut River valley lived their lives. The choice to build a birch bark canoe using stone age tools and techniques, and raw materials entirely from area woodlands, was significant, as the canoe gave the Indians a mobility that was a quantum leap ahead of their otherwise literally pedestrian means of travel. Horses were not around prior to the European arrival, in the southwest they had made an appearance as runaways from the Spanish arrival in Mexico in the late 1500's. In the northeast the Indians walked.

I have seen Jim's canoe, several years ago he presented a workshop at the Mystic Seaport Small Craft Weekend on working with stone age tools and indigenous building materials to build a serviceable small boat. Jim's canoe was small at 13', a choice he made to minimize his need for large amounts of birch bark, but very serviceable. As I watched him paddle it I realized that here was a confirmation of the intrinsic value of the small boat. A vehicle could be built from locally available materials, using tools made from stone (flint), that would provide the mythical "seven league boots", enlarging the builder's geographical range tenfold or more. Jim's canoe was as serviceable as the modern day product of industrial America.

Our love of small craft is not just a whimsy involving amusing

ourselves. The allure we feel radiating from all sorts of interesting small boats has this underlying utility aspect. Here is an artifact that will give us mobility over natural ways, the streams, lakes and seashores. It will enable us to travel extensively should we so choose, without the need for mankind's constructions, roads in other words. The Indians used the water for such travel, they had to do so to function socially as both hunter/gatherers and agriculturalists. Walking anywhere meant, even then, construction of trails. And lugging any amount of material along was burdensome indeed. The boat would do it far more efficiently, and waterways abounded awaiting such use by man.

Jim's narrative about his trip up the Connecticut in "The Ant", after he had completed it, is as absorbing in its social outlooks as was the chronicle of the building of the canoe. He travelled with only materials and foods that the Indians would have had access to, camping at riverside and gathering wild edibles to go with his carry-along Indian foodstuffs. Yet he could not escape the intrusion of civilization, and made no attempt to be totally a "purist". At Millers Falls, faced with a giant hydroelectric dam and several miles of stony river bottom bereft of water below the dam (water is diverted through penstocks to the power station before being returned to the river downstream) Jim accepted a "portage" in a pickup truck. As he put it, "the Indians didn't have to deal with a hydro dam."

And near the end of his trip a summer later, Jim found that once he got north of Hanover, New Hampshire, the public interest in his attempt to recapture the old ways changed from romanticizing the adventure into pragmatic wondering as to why he'd want to do something like this the "hard way". The people in northeastern Vermont already found their lives hard enough without going looking for a harder way.

But to Jim Dina, discovering how it felt to do this the "hard way" was the essence of his experience. This has some relevance, I think, to why we like to paddle, row and sail ourselves. That "hard way", once the "only way", still tugs at our racial consciousness, despite our mastery of time and space through the use of technology. If this feeling is familiar to you, be sure to get a copy of "The Voyage of the Ant" from Jim.

WOOD AND CANVAS KAYAK BUILDING



George Putz

Reading George Putz's book on building a traditional skin kayak was a bit of a throwback to my earlier years of becoming interested in boat building as a recreational activity. After having done some stitch and glue kayak building in the modern "quick and easy" mode, reading about how to build a kayak over building forms was a nostalgia trip to that time a dozen years or so ago when I first discovered traditional small craft and John Gardner's writings on that subject. Putz tells you in this book, in step by step detail, with lots of photos, how to go about building either a 17' solo or an 18-1/2' double skin kayak patterned from lines Howard Chapelle took from a south Greenland eskimo craft. Norman Skene later converted these lines into building plans for we modern types and his article on building "Walrus" from "The Rudder" of June, 1923, is reproduced as an appendix (1923 was "modern" by this boat's historical scope).

This business of boatbuilding craftsmanship is carried even to planing the building forms to their lines. Six stations are cut out from plywood, tall enough to make the building form one that can be stood at while working on the boat. That part of each at the top, which form the "bulkheads" that determine the kayak's shape, is not just sawn to the marks, but sawn a bit wide of them and then planed by hand to the marks. Such is the way this book goes about instructing the reader. Putz relishes the no hurry, methodical setting up for building, and subsequently the fabrication of all the many pieces that go into this way of kayak construction.

While George pursues the mys-

tique of the traditional way of building, he's not seduced by the siren song of using only long, clear pieces of expensive wood that classic traditional boat building sings. No "clear white pasture oak, old growth pine, deep swamp eastern white cedar, longleaf yellow pine, cypress, exotic mahoganies, butternut, Sitka spruce, Port Orford cedar," are specified. He points out this kayak is built like a bridge truss, is kept indoors when not in use, and is not expected to stand up to the North Atlantic in winter. So this book becomes ever more charming to read as the author's personal mix of old and new ideas becomes apparent.

The cover pitch tells us that Putz, described amongst other things as a "curmudgeon", tells the reader how to build this really sturdy, useful boat for under \$250 that will "absolutely shame those neon-hued store bought versions that cost more than a monthly mortgage payment." And the "curmudgeon" himself acknowledges a debt to International Marine's publisher, John Eaton, who said to himself, in Putz's telling of it, "I've got this great idea; I'll let Putz write an obscure book about an antiquated boat built of organic materials!"

You can tell that I think the author is the most significant plus about this book, for it is a very readable "how to" book, and the ongoing revelations of George Putz's little idiosyncracies as you progress through the book are very entertaining. I also got some practical inspiration from the book. I am not about to build a skin covered kayak with all its frames, stringers, canvas stretching, etc. when I can cut up 4mm lauan ply into the right shapes and build the same hull much faster and lighter. But, I decided to build his building form setup for the 16' kayak I am undertaking for this coming season (I too cannot afford that mortgage payment). I could stitch and glue it once I have my piece parts all worked out to shape, but we want to build a fleet of several for family and friends to enjoy. So the building jig will provide the

place for slapping on sheets of lauan precut to shape for taping and gluing seams without the stitching part, and with good dimensional accuracy from boat to boat.

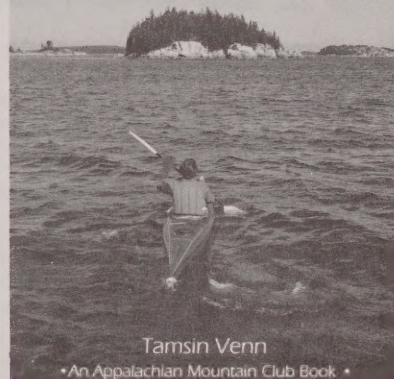
"Wood & Canvas Kayak Building", 136 pages, 7-1/2"x9-1/2", softcover, photos, diagrams, stock lists, supplier sources, is available from International Marine Publishing, Blue Ridge Summit, PA 17294-0840 for \$17.95 (plus postage & handling) if you cannot find it in your favorite nautical bookstore.

Review by Bob Hicks

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PULLING WITH THE ADS

I sold the Penguin I advertised in the "Classified Marketplace" to Bob Younie in New Hampshire, but also got serious calls from Texas and Illinois, people who would have bought it if it hadn't already been sold. You're pulling with the ads.

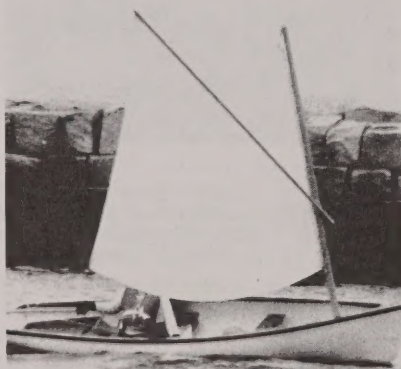
Jim Wilson, Easton, CT.

CANAL CRUISER 90% COMPLETE

I was getting worried about you with no "Messing Abouts" turning up after the holidays, and feared you had died and gone to your reward. But, reassurance arrived with the January 1, 1991 issue, including with it your reporting on my pedal powered canal cruiser.

The prototype is 90% completed and I hope to have it on display at the upcoming Pedal Power Potlatch #6, May 11-12 at the Center for Wooden Boats in Seattle, Washington.

Phil Thiel, Seattle, WA.



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Your Commentary

KAYAK SURFING

Living at the beach on the west coast, I board surfed regularly for many years. Eventually surfing gave way to a shoulder injury, and other interests. But the fascination always seemed to remain.

Two years ago I borrowed a neighbor's kayak and began paddling regularly until I became too embarrassed to ask him for it. My wife and I found an ad in the local paper; two kayaks for sale. We looked at them and couldn't decide on which one, so bought them both. In these kayaks we paddled regularly on Mission Bay for about a year. It was extremely convenient for us as we live only 200 yards from the Bay and the ocean.

I kept looking at the surf, wanting to explore the waves again. Six months ago I did, and now I can't get enough of it. I surf as much now as I did when I was twenty years old. It is a real challenge at times, and physically taxing, but what a thrill. A strong roll is required, otherwise swimming is a prerequisite. I paddle a Dancer by Perception, perfect for my surfing needs.

I enjoy your publication and my thanks go to Dr. Glenn Goltz for my gift subscription, turning me on to "Messing About in Boats". It's great!

Bill Phillips, San Diego, CA.

ENJOYS THE D.C. BEARD SERIES

I especially enjoy the D.C. Beard series. I can remember when I was young trying to make some of his boats. Almost drowned trying to build a slab canoe or whatever he called it. I guess he was calling for a bigger tree than our local saw mills cut. It brings back fond memories.

Bill Irwin, Amite, LA.

LOOKING FOR "DOROTHY" AGAIN

I watched my first boat building job being done on the beach near the Ala Wai in Honolulu in 1935, two fellows building John Hanna's "Tahiti" ketch. John also designed "Dorothy", a 24' dory type which I became enamored of, and carried around the plans for 30 years, only to lose them in a fire five years ago.

I guess you know I had a time tracking down those 1933 "Modern Mechanics" "How to Build 20 Boats" plans! Through the kindness of the staff of International Marine Publishing Company, I was able to locate Mrs. Dorothy Hanna, John's wife, who was 99 years old and still living a very elegant life in California. She was able to send me a part of the plans for "Dorothy".

But, it was your advertiser, E.G. Ragsdale ("Old Boat Plans" in the Classified Marketplace) who provided me the whole lot. He has got some kind of plans library, believe me!

Well, I want to build the boat but I can't face up to the 10 times cost of the materials compared to when I first had this dream. So I guess for now I'll just have to power the old jon boat I picked up and rework it the best way I know.

Robert Hange, Crystal River, FL.

FOLLOWING LEWIS & CLARK AGAIN

We all really enjoyed having the journal of our canoeing trip on the Missouri River following the Lewis & Clark route published in your magazine ("Boats", Nov. 15, 1990).

Immediately after we had returned, NOBODY wanted to ever do it again, but soon after everyone was talking about the NEXT TIME, including the adult members of that expedition. We had been underpowered somewhat with two ten year olds, one eleven year old, and two thirteen year olds included with the two older teens and we three middle agers. This made it a very strenuous wilderness trip, but a true character builder.

Now we plan a return trip with about twice as many people in June of 1992, as some more of our grandchildren will have turned 10 to 12. It will also involve other adults who did not go on the first trip. We are all looking forward to again retracing the route of Lewis & Clark.

Zella Matthews, Yelm, WA.

MORE ON SMALL POWER BOATS

Thanks for a great magazine for us small boaters. I would like to see more articles on small power boats, both inboard and outboard. One of my boats is a newly purchased 15' aluminum Nautilus outboard, 1958.

Bob Pedersen, Massapequa Park, NY.



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Herb Klinger, S. Salem, NY



WINTER EXPEDITION

Here is a photo of Alan and Mary enjoying a winter expedition in a boat I built for my mother as a Christmas present in 1982. It was designed to be left on the beach, either right side up or upside down, with oars and PFD's under

the seat, and to be dragged up or down the beach by the bow handle or either stern handle. It measures 11'x4', 65 pounds new, made of 1/4" fir plywood and Sitka spruce gun-wales.

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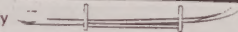
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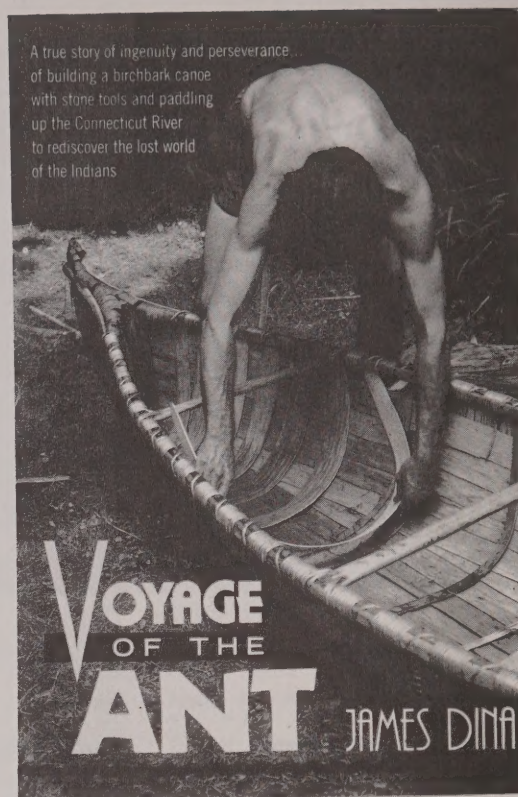
The Voyage of the Ant

James Dina's book about his efforts to recapture the nature of life in New England before the Europeans arrived focuses on his building a birchbark canoe and paddling it up New England's major interior waterway, the Connecticut River. It is a fascinating narrative of a modern man attempting to relive a way of life the indigenous Indians had created to fit their environment.

The book intersperses discussions of building the canoe using only materials and tools that were available to the pre-European Indian culture, with his narrative about his trip on the river, travelling mostly as the Indians did, carrying his own foodstuffs and gathering wild edibles along the way. Inevitably he had to confront modern day intrusions impossible to avoid on the river, but he accepts that reality and doesn't let it detract from his own personal experience.

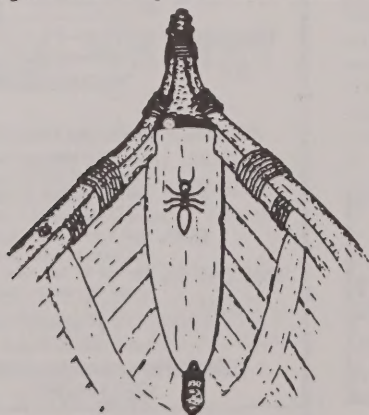
The building of the birchbark canoe using only stone age tools and indigenous materials from the forests is of particular interest to anyone who appreciates traditional canoes, what could be more basically traditional. So herewith we bring you extensive excerpts from Jim's book on that building process.

If you'd like an autographed copy from the author, order one from James Dina, 789 Main Street, South Windsor, CT 06074 for \$14 postpaid.



The Ant

THE HEADBOARD is a vertical piece of wood that encloses the open space where the canoe's gunwales sweep upward to meet the stem piece. Its position is such that the canoeist's gaze falls naturally upon it as he propels his craft. It is the last visual symbol between himself and the waters beyond. As such, it is properly decorated with a figure that holds special meaning. I had searched in vain for a design. Then I considered the temperament required of a traveler about to undertake a strenuous yet monotonous voyage upstream against current and wind. Without hesitation, the Ant suggested himself. He is a patient, tireless worker who keeps his eye on the immediate duty without losing sight of a distant goal. With my stone knife I etched a nameless ant on the headboard, hoping he would be up to the tasks ahead.



The Connecticut River flows southward a scant half-mile behind my home. From there it is just fifty miles to the river mouth in an arm of the Atlantic called Long Island Sound. Northward the river bisects Massachusetts and then becomes the common border between Vermont and New Hampshire. The uppermost thirty miles of river are entirely in the little hump of New Hampshire that stands above Vermont. There is a puddle just short of Canada called Third Lake. It is the river's source, three hundred and sixty-one miles from home. The Connecticut is the natural gateway to New England. It is the watery thread that ties together four states. It defines the region in a very real sense by draining its heartland. Although not as wide and deep as New York's Hudson River, it is longer. Four hundred and eleven miles from source to sea, it is large enough to be majestic and commanding, yet small enough to be personal and inviting.

I visited the river often, watching it rise and fall in response to the seasons. Broken stone tools and potsherds from another age dotted the sands at low water. I picked up the artifacts and enjoyed the tingle every archaeologist feels when he unearths a piece of the past. But I also felt something missing. Living human beings had produced these items. The pieces remained as evidence of what they had done, and from them the archaeologist could even recreate their life-styles. But the testimony of silent stones left me cold. It told me nothing of what the people felt or who they were. I needed to know. Ten years of walking the riverbanks hadn't given me the answer, but it *had* made me realize how little the river and local surroundings had changed since those artifacts sustained the lives of real people. Here was a setting that was still relatively remote, with traces of the primitive world strewn about. This was the right place to make contact even if the time was wrong. Echoes of the past were faint but persistent. It was like listening to voices through a closed door that I couldn't open. There had to be another entrance.

There was. It came in the form of a gift, a thin book. The elegant profile of a birchbark canoe glided across the front cover. Thoughts of making

such a canoe had crossed my mind over the years. The little volume in my hand wasn't an instruction manual for building canoes. It was John McPhee's book about Henri Vaillancourt of Greenville, New Hampshire, who makes fine birch canoes. Immediately, I knew that this book was the second key to my quest, like a small spark falling on dry tinder. This canoe was the obvious vehicle I needed to become a time traveler into the Connecticut's past.

A canoe is so close to the water that one can feel inadequately connected to the river in any other vessel. Of all canoes, the birch is the most organic, as its parts retain much of their original living character. The flesh of planking and skeleton of gunwales and ribs are united with ligaments of pine root. The headboard, so aptly named, gives it the vision and temperament of whatever symbol is emblazoned on it. The bark skin, which served the birch tree by retaining its precious water, is reversed against the river to keep water out.

Building the canoe and voyaging in it would be a major undertaking. Still, I was confident that I could produce a serviceable craft. In New Hampshire, Henri Vaillancourt was building better canoes. Somewhere in Canada, native American descendants were doing the same with steel tools. Merely reproducing their efforts at lesser quality would provide me with a canoe but little else. As far as I knew, no man living today had built a birch canoe with stone tools. Limiting myself to the tools and materials available to primitive Americans would require me to rediscover ways of thinking and doing that had disappeared centuries ago, and would admit me into the world of the past. The river waited. The canoe would speak for itself when finished. It was my great hope that I could recapture the spirit of those lost times in the process.

Tools

Picture yourself standing in the meadow of a remote woodland, or just in the park. If you need a switch for swatting away deerflies, a branch broken from the nearest tree will suffice. Breaking it is simple, but the green fibers are resilient and take some twisting. The result is not neat but it is easily prepared with the human hands—and it works. Your own physical abilities can take the project a little further. If a smooth stick is preferable, the thin bark can be shredded off with your fingernails or teeth. What if you want one side flattened? A fingernail, and patience, will enable you to split it down its length. In each stage, some part of the human body produced the tool directly. Next try to sharpen a stick at one end, for digging, poking holes, or protection from growling dogs. Neither tooth or nail is likely to suffice as the wood is too fibrous. Drilling a hole anywhere in the stick is even further out of the question. Additional progress demands a new approach. Find a flat rock, or nearest pavement in the park. A few minutes of abrasion will sharpen the hardest wood. A natural sliver of stone or piece of broken glass twisted back and forth will carve the shallow beginnings of a hole.

As rudimentary as this new procedure seems, the concept behind it is momentous—one tool used to fashion *another* tool. Only man has ever done this.

I began playing a game whenever I went into the woods or meadows. With the picture of a finished birch canoe in my head, I walked through the landscape, seeing every natural raw material for what it was, blocking out all thoughts of tool processes or semi-finished stages. What parts of the canoe could I make now without tools? Nearly none, I concluded in short order. Technologically, I felt inadequate. A new question became pertinent: what can be made on the spot even if it is not part of a canoe?

This was the key. If I were to relive man's mechanical history during this brief year or two, I needed one-way vision: starting as simply as possible, building what I could instead of what I was supposed to, viewing each stage as the pinnacle of achievement, and being satisfied without the frustration of knowing what came after the birch canoe.

The nearest flint supplies were in the Hudson Valley in New York State. Several years ago I had learned of a quarry site there and visited it to see

what I could find. Whatever the mine's initial condition, it was now largely overgrown with mature trees. No native tool manufacture had occurred for centuries. Under the leaf cover were countless chips. Here and there was the heart of an exhausted cobble. Digging about turned up an occasional piece that had not been worked. No doubt, there was a great deal of usable material in the hillside, but getting at it would require considerable effort. Generations of native Americans had worked the most obvious material—from the last Ice Age down to the seventeenth century—before flint was eclipsed by white man's iron. Finally, I arrived, to visit among the ghosts of vanished craftsmanship, trying to recapture a time that no longer existed.

I daydreamed of the past, of discovering a virgin outcropping of flint, unworked and undepleted. What a feeling to pick up a cobble, consider its possibilities, then crash a hammer stone against it with casual regard for the outcome, knowing that a thousand others await a similar test. The near reality of the vision was overpowering. This was indeed the correct place, but I was centuries too late . . .

We were passing a series of low hills on the left. To our right, fields and broken woods dropped away toward the Hudson River. Suddenly a larger bulldozed section appeared with a convenient driveway leading into it. Our reactions were simultaneous. Bob braked and turned hard left. We stepped from the car onto ground nearly paved with flint.

"Thwack!" The hammer resounds as I swing it into the precious black stone in my left hand. A thin dark blade ripples loose and strikes the ground with a clatter. There it joins a growing pile of chips. Some have been there but a few moments, others since the first ancestors came to hunt along the ice. This stone is not like others. It is smooth and shiny. When it is broken, it yields a sharp cutting edge. It is found only in a few places.

Select a flint cobble and study its possibilities. Strike off larger pieces with stone hammer, thinner ones with the heavy antler. Abrade the edges with a quartz pebble and strike again with the light antler tip. Stop working when a thin, leaf-shaped blank has taken shape. It is neither knife blade nor projectile point, but can be fashioned into either with some final retouching. At this stage the chance of successfully completing the piece outweighs the chance of breakage. Such an item was highly tradeable, hence this was the form in which most flint left the quarry site. I had produced twenty-five such blanks,

The wispy clouds parted for a moment, bathing the landscape in the tawny hues of late afternoon. I looked up, mindful of the surroundings for the first time in hours. My eyes searched the valley's distant folds and met with little to suggest that this was anything but the end of the last glacial epoch. I could have been a Paleo-hunter, watching for the distant passage of game herds. A single sound reminded me that this was all real. It was the *thwack* of an antler hammer nearby. A fellow artisan was preparing tools.

Fire was the final element over which primitive man exerted an influence. Fire's domestic form is always a useful tool. The problem is not how to control it, merely how to obtain it. Each of the rustic methods has some limitation. Sparks generated by striking flint against steel are hot and easy to produce. But I didn't carry anything metal.

Then there is friction, "rubbing two sticks together." Every fire kit of this type contains two essential pieces, the fire drill or spindle, and the fire board, often called the hearth. Heat is generated by spinning the drill tip in a shallow pit in the flat hearth. Small, hot particles of wood dust collect in the notch that runs from the pit to the edge of the hearth.

I pursed my lips and sent a fine spray of moisture into my opened hands, slapped them shut on the spindle, and spun again, faster this time but with less pressure. Dust overflowed the notch, insulating the hottest particles deep inside the little pile.

My arms couldn't hold out much longer. I tipped the spindle back and spun a last time. If the birth of a spark were to occur, this would be its moment. I lifted the drill and gently pushed the dust from the notch into a nest of shredded cedarbark tinder. With my hand I fanned the little pile, just hard enough to clear off the outer cinders. Smoke swirled from side to side. I was hopeful. I fanned harder. A faint orange glow appeared.

Seek

I had settled firmly on this idea of building a primitive birch canoe. But how does one begin to construct something for which he lacks the parts, the tools, even a firm plan?

My first concern was finding materials, all from the natural environment. I wanted to act as part of the system, not a detached harvester, and this affected how and where I searched. Whenever convenient, I walked or jogged to an area that interested me. But what if circumstance made it inconvenient? Should I use the car? Primitives on foot would have been willing to go just so far to obtain supplies. I could only guess at the distance so I made conservative estimates. A single day of walking, about twenty miles, felt right.

Betula papyrifera, appropriately nicknamed "canoe birch," grows across a wide swath from Newfoundland to Alaska. At its eastern end, the band dips deeply to include our Great Lakes region and all of New England. Not surprisingly, the traditional range of Indian birch canoes was restricted to the region of really prime trees, roughly northern New England and Quebec across to the Great Lakes.

No primitive birch canoes survive from southern New England. The specimens displayed in museums are from farther north and, for the most part, were made during the nineteenth century with steel tools.

Now I looked at the trees with a more critical eye. There is an ideal combination of large trunk diameter and straightness, branch-free length, and resilience of the bark itself. Such trees are never common even in prime birch country. I guessed they were rare enough in primitive times, too. Back then, birch bark had many uses, which included fashioning containers and covering dwellings. Of course, the best trees were sought out exclusively for canoes. Today, my direct competition from humanity was negligible. Indirectly, however, agriculture, lumbering, and housing development all reduced the acreage I could search, offsetting the advantage I enjoyed in being the area's only canoe builder.

Actual harvesting of birch bark is easiest in early summer, when the sap is flowing and the bark slips readily from the wood. For now, a small sample to test quality was all I wanted. When I spotted a likely candidate, I cut away a small triangle of bark from its base. Heavy bark, at least an eighth of an inch thick, is best. I bent the sample gently between my fingers, and rejected it when it split easily or separated into layers. If resilience was adequate, I walked around the tree several times, making a visual check for "eyes," the imperfections that occur when lower branches grow through the bark and then die off from overshadowing. Big eyes weaken the bark and require patching during canoe construction. Piecing out the hull with several sheets of bark was common practice for large canoes. Mine was going to be fairly short, and I wanted to avoid underwater seams by using one large sheet.

After the bark skin, northern white cedar (*Thuja arborvitae*) is the most important raw material. The Indians called it *Oo-soo-ha-tah*, meaning "feather leaf." It is the legendary wood of canoe builders. Most of the woodwork—ribs, planks, gunwales, and stems—may be carved from it. Every book on canoe building lauds its value. It is lightweight, resistant to rot, easily split into thin slats. Although not strong, it is reasonably stiff.

I still had cedar on the brain and planned to exhaust every possibility. The only cedar I found in abundance was Eastern red cedar. Its aromatic wood is a popular lining for chests, as moths dislike the aroma. There were large, straight trees on my old partridge ridges. I found a dead trunk that was weather-split, pried off a sizable section and dragged it home. The wood was strong and twice as heavy as white cedar. Scores of little knots made controlled splitting impossible.

I reread the passage on cedar in one of my Indian how-to books. It told everything about this wonderful wood, then concluded by mentioning that other woods were substituted where it was unavailable. I was becoming furious with the writer! What other woods? My annoyance evaporated as I considered that he hadn't harvested the materials he was describing. He might have seen a canoe under construction. Very possibly he had only heard a description or, worse yet, read it somewhere else. At last it dawned

on me that no living writer or speaker had ever built or remembered seeing anyone else build a birch canoe with Stone Age tools. In this pursuit I was alone. Somewhere, sometime, some primitive boat builders had come up with the design, materials, and methods for creating the birchbark canoe. There was no tradition that dictated their choices. Right now, I found myself in their same position.

Black ash, nicknamed "basket ash," caught my eye. Its unusual qualities are a result of the spongy springwood pores. This thin layer between summer growths is easily crushed by pounding on the log. Afterward, the outermost layer separates along the annular growth ring. Black ash, the author said, grew in swamps all over New England. I had never seen a specimen. The book was kind enough to suggest white ash, hickory, and oak as stronger alternatives, although they required more pounding for separation.

There was a good stand of white ash back in the meadows. I picked a big standing tree and removed the outer bark on one side. The light yellow sapwood was wet and shiny. I beat up and down a narrow width using a hickory club that looked like something out of the "Flintstones" cartoon. After cutting through this layer at the upper end, I began prying with a flat rib bone. The splint came free readily enough, but the grain was fractured and limp from the beating. The next layer inward appeared drier and less active. I pounded again, cut and pried. The splint came away intact. Although twice as heavy as cedar, it was much stronger. The considerable labor it took to produce a few trial ribs bore no resemblance to the jest about carving a toothpick from a redwood tree. The slats were smooth and uniform, a near-finished product that had real potential for canoe ribs.

The ash held further promise for gunwale members, as it is famous for easy splitting when green. I thought I had passed many saplings that were straight and knot-free, an important requirement with stone and wooden wedges.

Gather

I walked back to my birch grove, armed with three tools: leaf knife, stone axe, and a thin ash splint. The first canoe tree was large, fifteen inches in diameter. Felling it with the axe was out of the question. Fire, in fact, was the only effective tool primitives possessed for heavy tree work, but it would ruin the bark. The alternative was to take bark from a standing tree using a ladder.

Building a ladder on the spot was the axe's only duty. I felled three ash saplings, stripped their slippery bark, and laid two of them out to form an elongated V. These were the legs, crisscrossed at the top. After splitting the third sapling lengthwise, I chopped it into rungs of decreasing length and notched the legs to receive them. The ladder was ready as soon as the pieces were bound together with their own bark. It trembled as I raised it against the birch.

The stone knife accomplished the next task. Starting near the ground, I sawed a vertical groove through the bark up the trunk's full height. This work went smoothly.

The last step, prying the bark free, was the most delicate and toilsome. There is no better tool than a flat, flexible stick sharpened to chisel shape at one end. Working carefully, I pried the edge of the cut to lift away the bark. Unlike the skin of most other trees, birchbark grain runs around the circumference and is prone to splitting during this first operation. The material gives but can be forced only so fast and far. After working about two inches under the cut I moved up the trunk to do the same. The crisscrossed legs of the ladder formed a little V at the top, which gripped the tree trunk securely without getting in the way of the work—unwitting luck. I climbed again, working the trunk around, an inch at a time. An occasional tight spot required special care to avoid splits.

The quarter on either side of the saw cut was easiest. The back half of



ASH SAPLING LADDER

the birch was harder to reach, with the curling edges of the free bark somewhat in the way. I wet the splint and bent it into an arc approximating the trunk's curvature. This helped.

It was fairly comfortable working in the same forest shade that had forced this birch to grow straight in the first place. Beams of sunlight pierced the canopy at new angles, lighting different patches of the ferns below. Most of the afternoon was gone by the time I had cleared the bark around the tree base. With new enthusiasm I worked upward, splint around one side, fingertips on the other. I supported the sheet's full weight with one hand as the last patch of bark broke free. The bark flopped accordion-like on the ground as I climbed down.

I spread it out for inspection. The single major eye was unbroken and smooth on the inside. I had accidentally caused a foot-deep split in the upper third. With proper positioning it might be above the finished canoe's waterline. Overall, the sheet looked satisfactory. I rolled it lengthwise, tied it to the ladder, and dragged the assembly out of the forest like a travois. I looked back to see the glistening orange trunk of the stripped birch tree. It would soon die for its contribution to my canoe.

The next week I harvested a second birch roll, as even a small canoe can seldom be covered by one tree. I weighted them both with stones and sunk them in my neighbor's farm pond to prevent them from drying out. The precious bark was now safe.

I needed a heavier stone axe before I could harvest gunwales. The use of a tool often dictates the manner and material of its making. Because flint is brittle, the tooling can be accomplished with percussive blows alone. Likewise, percussive use is avoided except when taking advantage of flint's superior piercing qualities. Thus Stone Age hunters were constantly replacing broken javelin and arrow points. An axe, on the other hand, is always used percussively, hence one selects stone that resists shattering.

Unlike flint, stone for axes is not rare in Connecticut. Basalt is a very good material. Most people have seen it as crushed traprock, used for road paving. Coming from the deep earth by volcanic intrusion, it is hard, dark gray, and heavier than the granite that forms the continental masses.

I squatted over a rubble pile, picking my way through hundreds of pieces. Within an hour I had selected half a dozen promising blanks. One in particular was extremely graceful, a foot long and nearly rectangular in cross section. It was half as thick as it was wide—a good proportion for strength. The taper was just right.

Two abrasive techniques, called pecking and grinding, are employed, in that order. A good pecking stone is harder than the axe material. Fist-sized cobbles of quartz serve nicely. The axe blank is held in the left hand. With a loose right hand, the cobble is rapped against the axe in a quick series of little blows, like a miniature jackhammer. Fine dust appears as the basalt surface crumbles away ever so slightly. With enough pecks the cobble cracks minutely, exposing new, sharp crystals.

After several afternoons were thus whiled away, the axe blade had thinned to the point where further pecking might destroy it. The remaining material had to be removed by grinding. The grindstone was a slab of tight-grained sandstone I picked up on some foraging trip. It was a simple job to rub the axe across it at the angle of the finished edge. Boring. I turned the axe head over and did a little on the reverse side. Progress was nearly imperceptible, not unlike watching the tide come in.

My next task was to decide on the canoe's dimensions. Native canoe styles varied tremendously. Within a given tribal group, one type was usually produced. Its profile, hull form, and treatment of the ends were characteristic. What did vary was the size of individual canoes. Records exist of traditional historic builders using measuring sticks with carved notches. Obtaining correct proportions once the length was set could have been as simple as doing what was done the last time. Since this was my first time around, I decided to work on the gunwale and thwart assembly while I was laying out the bark, so as to ensure a fit.

The better bark roll had a twelve-foot running length with a single major flaw, which could be patched. Thirteen feet or so sounded like a sufficient gunwale length. I needed four good rails, since the gunwales are assembled in pairs—an inwale and outwale on each side of the canoe. Economy called for the thinnest, straightest ash I could find without branches below the thirteen-foot mark.

I located my tree after a considerable walk and struck the first axe blow about noon. A little chip of bark flew off and exposed a thin sliver of yellow-green sapwood. The idea of walking out with split gunwales seemed ridiculously remote. This was no giant tree, but with a five-inch diameter, it was near the limits of Stone Age capability. I chopped away, one chip at a time. The fog had cleared by the time the ash fell, well over an hour later. Parting the trunk from the crown went faster. After chopping halfway through, I muscled the trunk onto a convenient boulder and jumped on the free end. A crack began to spread down the trunk's center. I chopped away some small branches, tapered them, and drove them into the crack. It drifted off center a bit, but it didn't matter as the butt end had wood to spare. This was the most difficult split, for the full log was awkward to maneuver. Controlling the quartering splits was easier. A few simple tricks made splitting more predictable. It was safest to start from the small end of the tree. Knots were easier to pass and tended to vee the crack back on center. When the split did drift off, bending the thicker side between two standing saplings helped to correct the error. As the crack lengthened, the stressed wood fibers began breaking away to the thinner side.

The little caches of material tucked away in corners of the backyard were growing. Birch bark and split ash, the essential items, were stockpiled in quantity. I needed more ash splint ribs, but that was just a matter of more pounding. There were other outstanding odds and ends, a few needs still unidentified.

White pine roots had to be prepared before I could begin stitching the birch bark together. Once again memories of former wanderings led me back to a sandy hillside, reforested exclusively with pines. Digging was easy. I spent a day collecting one hundred feet of root, some as thin as twine, others as thick as my finger.

I wouldn't need pine pitch until much later, but it was worth prospecting for it while among the pines. A book suggested blazing tree trunks with an axe and collecting the oozing sap with a flat stick. The few drops I was able to collect hardly moistened the stick, even in the heat of late July. There had to be a better way. I hoped I would discover it in time.

Build

THE DESIGN PARALLEL between birch canoes and the wood-canvas variety is interesting and somewhat surprising. Superficially, the two might appear alike, except for the substitution of sheathing material and the use of nails and modern sealants. The analogous parts do occupy similar positions, but they play against one another to produce strength and rigidity in different ways. A canvas canoe is begun from the inside, with the ribs spaced along a building form. The lengthwise planks are fitted over them, edge to edge, and nailed to them. With the addition of gunwales, stem pieces, and thwarts, the hull shape is completely determined. Canvas is stretched over the hull and sealant applied to the porous cloth. The sheathing operation is the last step.

The Indian canoe is built from the outside in. It begins with the white birch sheath. The strategy of construction is different. The bark, held to form with stakes driven into the ground, is stitched into a large, canoe-shaped bag. Gunwale pairs are lashed in place, pinching the bark's upper edge, as are the curved stem pieces at each end. Thin planks lining the bark hull float between the bark and the ribs, distributing the latter's pressure. The ribs are forced in over the planks, their tips held under the beveled inwale by friction alone. Countertension set up between the gunwales, ribs, and bark keeps the structure stiff and tight as a drum. The scheme is simple, clever, and elegant.

The lower backyard became the official building site. It was well-shaded for the comfort of the builder and benefit of the green materials, especially the bark.

I cleared a flat stretch for the building bed and centered the false frame there. This construction was canoe-shaped, but a little shorter and narrower. It was easily made from two of the inferior ash rails, spread with three cross struts. Although not a part of the finished canoe, it would hold the bottom area flat and define the turn of the bilge. When the hull was finished, I would sever the basswood bark lashings securing the frame and discard the pieces.

With the main gunwale-thwart assembly centered and suspended on stakes above the false frame, the preliminary layout was in place. I pounded eight long stakes—split one-inch saplings—into the ground along each side, their lower ends just outside the false frame, upper ends touching a gunwale as they ran past it. It looked like a series of Vs with their bottom halves cut off below ground. The bilge would turn sharply and the sides remain flat along the stakes while the bark remained on the bed. Later, when the ribs are added, the bark stretches tightly and follows the rib curvature. I removed the suspended gunwales and stowed them away. The present aim was to get the bark sheet under the false frame and bent up inside the stakes, which meant dismantling everything and starting once again from the flat earth.

I turned the bark's white side up and replaced the false frame, weighting it heavily with stones. A flat bark sheet must be cut, or gored, before it can be bent up around the football-shaped frame. Locating the gores requires good judgment. The large tear I made accidentally during harvesting would serve as a natural one. Other weak spots were likely candidates. There is no preset number but they should be close enough that the bark follows the frame smoothly when it is all turned up. As this was done for each section, I replaced the stakes in their original holes outside the bark and added companion stakes opposite them on the inside. With pairs of stakes tied together at the top, the bark was effectively pinched in place. It was beginning to look like a canoe.

I had found a book with photographs of Indians building a canoe somewhere in Canada during the 1930s. The first two plates showed men laying out the bark and frame. The third showed a woman with her children, industriously stitching up the numerous gores with split evergreen roots. Apparently the men never got involved in such laborious tasks. I pondered this briefly; no, I didn't dare ask.

The coiled-up roots had been soaking in anticipation of this next step. Debarking them is a simple matter of pulling each through the split in a green stick. Sewing is done with half roots, roots split lengthwise. A fingernail is sufficient to start the split at the small end, after which it is always pulled apart by hand. Roots about three feet long and one-eighth inch thick were convenient. The roots are supple but sufficiently stiff that they require no needle for sewing. I sharpened the root tip with one of the stray flint flakes littering the yard. Now all I needed was something to poke holes in the bark.

With a graver—a square-edged flint flake—I scratched an elongated S-curve down the middle of an animal's leg bone. When it was worn through to the marrow, I turned the bone over and did it again. When the second groove broke through, there were two awls in my lap. The natural end bulbs of the original bone made comfortable handles, each with its own tip from either side of the S-groove. A little sharpening on the sandstone grinder and it was ready by afternoon.

The edges of the gores overlap slightly as the bark is turned up along the curved false frame. This extra bark makes for a stronger joint, but the overlap must be taken toward the stern so that the joints will not rip open when the canoe passes over rocks.

Good bark is resilient, almost spongy. I poked through it with the triangular awl and gave a quarter turn. The tapered root tip slipped through easily. I poked a hole on the other side of the gore, threaded the root there and pulled tight until its flat split side lay hard against the bark. The half-round outer side gave a smooth, finished appearance—such beautiful materials to work with! The holes closed back on the root stitches, holding them snugly in place. The combination wasn't waterproof but I could see that would be easy to achieve with a little pine pitch. The first few stitches were a fascinating experience. The thrill wore off by the time I worked up the first gore. There were eleven more to sew. At least it wasn't so tedious as grinding the stone axe. And each completed stitch was a discrete unit of accomplishment.

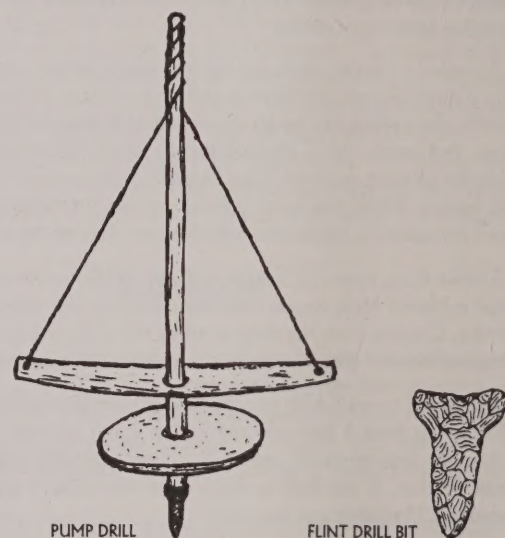
There was really no way to rush this work, so I didn't. The trick was to avoid getting locked into hourly, daily, or even weekly schedules that demanded deadlines for specific pieces of work. The resulting freedom was constrained only by the changing seasons—unequivocal deadlines for which no extensions are granted. It was now August. I would stitch and sew bark intermittently until fall.

Working solo, I moved through a varied spectrum of tasks. When I wasn't stitching, I worked on the gunwales. The ash rails needed trimming and tapering toward the ends. While still green, the wood works down easily

with a stone axe. Once the rails were near size, I planed them with sharp flint flakes. These were not specialized tools, merely conveniently sized pieces from the waste heap. All of this debitage, as archaeologists call it, was the result of finishing the large trade blanks I had brought back from the Hudson Valley flint mine. When a flake dulled or broke, I returned it to the pile for future service in some other capacity. This recycling of resources must have been part of primitive technologies as well.

The most difficult woodworking project was cutting the mortise holes through the inwales. These holes receive the matching tenon surfaces at the tip of the cross thwarts. The mortise and tenon is a particularly strong joint and appropriately used here. Although one never sits on the thwarts when paddling a birch canoe, they are subjected to considerable stress during portaging, especially the main or center thwart.

Drilling is the basic shaping process. I set aside several days to experiment with techniques. The simplest drill is a pointed stone, something like an arrowhead, held in the hand and twisted back and forth with wrist action; simple but slow. Efficiency takes an upward leap when the drill bit is tied to an arrow-like shaft that is spun between the palms. Considerable power is gained by attaching a stone flywheel near the bottom of the shaft and driving it with a cord attached to a perpendicular crosspiece. As the



crosspiece is pumped up and down, the cord winds and unwinds about the vertical shaft, spinning it first in one direction, then the other, while the flywheel's momentum rotates the drill through the end of each stroke. The pump drill must have been a major breakthrough when it first appeared. Something about it bothered me, though. It had five parts, very complex compared with the two-piece palm-driven drill. As I experimented with my new toy, I discovered that it was possible to control the force and speed by pressing the crossbar more forcefully during different points in the stroke. It was truly a variable-speed, variable-torque device, just like the drill in the Black & Decker ads—no cord or batteries needed, however. I decided it offered an acceptable balance between complexity and versatility.

A flint drill bit must be tapered toward the tip; otherwise it tends to snap off as the drill hole deepens. Of course, it cuts a tapered hole, and the drill begins to bind before it is very deep. Simple solution: turn the work over, drill from the other side, and hope the two holes line up. They never do exactly, making it easy for archaeologists to recognize primitive drilling techniques.

For my mortise joint I drilled two opposing pairs of holes an inch apart on each side of the rail, and chipped out the wood with a bone chisel. Sawing and scraping with a thin flint knife neaten up the edges. The finished mortise was roughly oval. Large canoes often have five thwarts. Mine would use three, or six mortises. I never completed more than one on a given day. They didn't match in size, either. But the tenons at the thwart ends were much easier to carve, and I planned to save the fitup for that step.

The gores were sewn. It was late summer; staghorn sumac berries were ripe. Their tangy brew became standard refreshment during long quiet afternoons in the lower yard.

From the start it was obvious that the bark sheet was too narrow to reach the gunwales at the wider midships section. This was usually the case and required the addition of a long, crescent-shaped piece to make up the shortfall. Like the gores, it was stitched in place. Stitching and more stitching—the task became subconscious. The finished patchwork was pleasing to the eye, a unity of beauty and function.

The curved stem pieces were surprisingly easy to make. Each required a two-foot length of ash sapling about an inch and a half in diameter. After flattening each side a little, I bound one end with a bark cord and split the other into four parallel slats. One at a time I bent them to the required curve. The cord kept the foot of the stem from splitting. When the contour looked right, I bound the slats together with a strip of basswood bark and staked them out to season.

All through the summer I visited the big ash tree, pounding off a few slats each time. There is no more intimate way to become acquainted with a tree's life history than to disassemble it in reverse order, a year at a time. Some slats were thin, a sixteenth of an inch or less. At ten years before present I encountered a heavy layer more than an eighth of an inch thick. It was what I had counted on for the long center ribs. Perhaps that was the year the ash penetrated the leaf canopy to become a dominant monarch of the woodlot.

The little pile of ash splints was growing, but I needed many more. I continued holding to the presumption that this was a sensible way to manufacture canoe ribs.

I returned to the sandy, pine-studded hillside to dig another hundred feet of root for lashing the gunwales. They were thick, about the size of a pencil when stripped of bark.

After sandwiching an inwale-outwale combination along either side of the canoe, I trimmed bark, leaving an inch-high flap. The root stitches are taken through the bark just under the gunwales, over them and back under again, two turns through each awl hole. This spaces the holes so that the bark isn't severely weakened. Much of the holding power comes from the squeezing of the gunwale pair as the lashings are drawn tight. For good measure, I folded the little extra flap of bark down on top of the gunwales before sewing the overstitches. After six turns or so, a space must be skipped where the ribs will meet the inwales. The alternate schedule of lashings and spaces made an attractive pattern. As I reached the cross thwarts, I passed two turns of heavy root through holes near their ends, pulling their tenon joints tightly into the gunwale mortises.

Only the ends of the canoe remained open. Soon I would lash the stem pieces between the flaps of bark at bow and stern, closing the hull.

Peach and crimson leaves filled the inside of the canoe, hiding the stones weighting the false frame. The cacophony of southbound geese overhead punctuated the message: summer was gone.

I unloaded the cargo of leaves and stones and cut loose the false frame. A few thin ash splints wedged inside were sufficient to keep the bark bag stretched to shape. I overturned it against the coming winter and directed my thoughts to other projects.

Winter Work

There was still much to be done. I was really in the mood to be back outdoors, working in the lower yard. I thought of next spring. Several details about ribbing and pitching were still unclear. As I tried to work through the steps mentally, I came up with an idea. Henri Vaillancourt was probably in New Hampshire, locked in his own workshop, wishing he could be outside, too. Why not give him a call and get expert advice? I had already sent him a picture of the stone tools and a note about my plans.

He answered on the second ring, a mild voice, well spoken but slightly aloof. I wasn't totally unprepared for this. After all, he was the white rediscoverer of the Indian birch canoe while I was an unknown with a fetish for stone and bone. He did remember the stone tool pictures: "Yes, they looked . . . sort of primitive." That was the idea, I thought to myself. I asked him about the cross-stitching on the stem pieces.

"Don't you have Adney's book? He shows that clearly in the section on root lashings."

"No." I had heard of the work but never acquired it, deliberately. I tried to explain that discovery was a part of my process. "The stem pieces are stitched in but I just wanted to check."

"I can't imagine building a canoe without Adney's book." My approach obviously hadn't made headway with him. "Where did you say you lived, anyway?"

"Central Connecticut, roughly."

"You won't find birch trees big enough for a canoe down there!"

"I already have the birch. I finished sewing the hull before Thanksgiving. What I'm really concerned about is the ribs. There's no white cedar down here. I've been harvesting white ash splints, the kind basket makers use. I hope they'll do for ribs."

"White ash? It doesn't sound like a very satisfactory material to me. Try something like basswood." Henri's voice was emphatic, convincing. I didn't want to give up the ash rib idea but let it go for the moment. I had many more questions, and none of the foregoing stopped him from being genuinely helpful.

"How thick is the bark you use to back up the gore seams?" I asked.

"You can use thin bark but it's apt to split. I use cheesecloth."

"Can you suggest a rustic substitute?"

"A thin hide would do: even deer isn't too thick," he suggested.

"Does it need to be dehaired and tanned? I'll be starting with green hides." He stopped to think—a modern canoe maker didn't need to consider such problems.

Before the call I had expected to come away exultant, with new information and confidence about my project. Instead, my feelings were unsettled, and it was difficult to say why. We hadn't disagreed over anything. He had given me seasoned advice about sealing the canoe and several other items. But he discredited the ash splint ribs, and I thought I'd been so clever to think of it. He appeared impatient with my primitive tools. He even pooh-poohed Connecticut as too far south for good birch. Yet his expertise was impressive, and everything I had heard about his status as a canoe builder was apparently fact. I respected him even more as a true professional to whom craftsmanship was paramount. And this is probably where we diverged a bit. For me, a canoe was the necessary vehicle for entering a lost world. My canoe didn't have to be perfect. Henri's did, and he was willing to make adjustments to obtain that result. Unlike him, I intended to adhere to my primitive ways no matter how poor the product. Our differences didn't involve lack of love for birch canoes, just point of view.

Spring Building

The canoe emerged from its winter cocoon in good shape. I inspected the seams and weak spots that required sealing. It was too cold to work with pitch yet, but I planned to back the stitched gores with hide, as Henri had suggested. Raccoon pelts were easy to come by this time of year. I repeated the tanning work I had done for the hide bags.

My meager supply of pitch from blazing trees had been expended sealing the mocucks. Until I could find a lot more, I wouldn't get very far. I sat in a pine grove to ponder the problem. The snow was gone but the ground was damp from the combined thaw and runoff of new rains. How had the trees reacted when I blazed their trunks last August? The sap ran to heal the wound, just like blood when I cut myself. Then the flow stopped. Cutting deeper into the heartwood with stone tools was difficult without cutting halfway through the tree and destroying it. As I sat up, the back of my jacket stuck to the tree trunk I had been leaning against. I turned around, then looked up to see all the pitch a canoe maker needed: fist-sized globs adhered to the surface of the trunk, most of them just below branches that had suffered winter damage. Some of these spots appeared to be a few years old. The pitch was still good, although needles, bark chips, and windblown dirt had collected on its sticky surface. I'd have to come up with a simple way to purify it. The more active spots had been bleeding hard enough already to spatter the lower trunk of the tree. Some climbing and a flat stick was all it took to collect the globs; in two afternoons I found more than enough.

When the weather warmed, I built a tar run—a flat rock with a slightly hollowed surface, set on stones to make a shallow incline. The globs of raw pitch went on the high end. A slow fire was burning underneath. I set up three little dams of pebbles across the creeping stream of melting pitch. The impurities hung up behind the pebbles, and the pure sap dripped off the low end of the rock into a clay dish.

Evergreen pitch is highly waterproof. After being boiled, it cools to a smooth, adherent glaze. Its major shortcoming is sensitivity to temperature change. On a spring day it may be strong and firm to the touch. The same material will crack under stress during winter, and turn stickier than bubblegum in the summer sun.

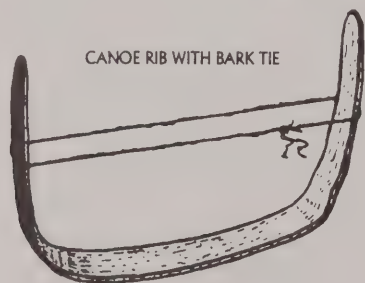
One needs to know the operating conditions of his pitched seams, that is, whether he is building a warm-water or cold-water canoe. Mine would be moderately warm. The books insisted on adding a little powdered charcoal to the pitch, though none explained why. The really important additive is animal fat. How much is best determined by experiment. I waited for a mild day, heated the mixture, and spread a little on a piece of test bark. When it cooled, I bent the bark gently. The pitch cracked. I added more fat and repeated the test. One mixture was soft to the touch; I boiled off some fat until it cooled firm.

A flat stick is the most effective pitch applicator. By the time hot material is smeared on a joint, the pitch has cooled too much to run deeply into crevices or adhere tightly. Reheating in place is necessary. A green twig with a little roll of flaming birch bark stuck in the split end is the standard torch. I rolled up the raccoon hide strips. Beginning at the bottom of an inside seam, I slowly unrolled the hide, pressing it into the hot pitch as I flamed my way up the gore. This was a delicate operation, as both pitch and bark hull are very flammable. I was starting to get good at it by the time I finished all twelve gores. After ribbing, both outside stem surfaces receive a similar pitch-and-hide treatment. The outside of each gore is coated with pitch alone.

By now I had a considerable pile of white ash slats. I resorted them into two stacks. Those about a sixteenth of an inch thick would line the canoe interior lengthwise, as planks. Most pieces were about six feet long, so I would need two sets of slats, each pair to be overlapped amidships. The thicker, stiffer slats would become ribs.

The final hull shape is a push-pull compromise between rib curvature and the amount of slack in the bark bottom. Bending these annular-ring slats was easier than bending split-out wood, as there was absolutely no cross grain to work against. But hot water makes any bending easier. I stood a single rib on end in a seamless bark dish and poured hot water along its length from a clay pot, then exchanged containers to repeat. The bends should occur roughly where the false frame set the limits of the flat bark bottom. I determined these spots visually. With my thumbs as markers, I placed the rib on the ground, stepped just inside my thumbs and pulled up on the free ends. Cedar ribs are usually bent in pairs to support each other against cracking. This wasn't necessary with the ash as long as I pulled up slowly. When half a dozen ribs were thus bent, I nested them together and constrained the ends from springing back with a basswood bark tie.

I couldn't wait through all of the bending to trial fit a few ribs. Pushing a bent rib snugly into position in the canoe, I now sighted where the rib legs passed the inwales. I cut them slightly long and rounded the tips on a slab of sandstone. Single ribs are set into the canoe at an angle to their finished vertical position, tips catching the beveled surface under the inwale. As



the rib is pushed upright, its web touches the canoe bottom. It must be driven the last distance with a wooden mallet, expanding the hull to its tightly finished form. If the ribs are overlong, there is a danger that the hull will split from too much expansion, so some trimming is often needed. Hot water dribbled along the gunwales makes the root lashings and bark more pliable, lessening the danger.

The trial fitup looked good and I returned to bending ribs. But before I was through, my last clay pot cracked and slumped into the fire. The interdependence between every link of my technology chain was indeed crucial. I had no choice but to suspend work on the canoe and begin making pottery.

The term *trial by fire* is especially fitting for primitive ceramics. My first vessel blew up during firing. I sifted through the ashes, disappointed. The pot itself would never have passed for an authentic Indian replica, but the broken shards looked amazingly like those I found along the riverbanks a half-mile away. Obviously, I was using the same material and methods as those primitive potters. They could have worked the same seam of clay, on this same spot. But it dawned on me that they would have been women, not men.

My own building and firing techniques improved quickly. The books told how squaws added a third part of rottenstone to temper their clay. What was rottenstone? Experiment once again. A cobble that broke easily into sharp grit provided particles to hold the clay paste together during drying and firing. I preheated the pots around a bonfire before overturning them onto the ashes, then covered them with rotten wood and bark. They began to emerge from the firing in one piece. Encouraged, I started to model my wares along traditional Algonquin lines.



LARGE CLAY POT FOR BENDING RIBS

Sea Trials

THE CANOE RIBS were lying in order on the lawn; they looked like the skeletal remains of a beached whale. Everything else was ready: planks lining the canoe held in place with a few false ribs; root lashings wetted down for flexibility; more water simmering on the fire in new clay pots. I had previously made a trial fit with each rib, trimming the ends where necessary, so that the rib driving could go forward with minimal interruption.

Work proceeds equally from both stem pieces. Two deeply V-sectioned ribs are placed at the first break between gunwale lashings, their tips under the inwales. Their webs tilt back toward the center of the canoe, even after they have been pushed snugly in place. Two more ribs are added at the next lashing break, one at each end. Once they are also hand-snug, the first pair is then driven a bit farther with a mallet. Rib pairs are added and driven alternately, those farthest from the center becoming vertical first. It is like watching a movie of falling dominoes played backward very, very slowly. Intermittent dribbling with hot water, careful driving, and plenty of time to allow the bark to stretch tight are all equally important.

There were only a few chores left. The outside seams were pitched, and I just had to check for leaks. The easiest way is to suspend the canoe from two trees with ropes and pour an inch or two of water inside. It's never leakproof the first time. A piece of charcoal is used to mark each drip, and after drying, the spots are touched up with fresh pitch. Several such cycles may be necessary.

The canoe was in the pond. I steadied one hand on each gunwale, trying to get a feel for how it would react to my full weight. I knelt on the bank, and brought my right foot in behind the main thwart. The canoe was vibrant with buoyancy. As I swung the other foot over, it heeled suddenly then settled, still upright. I moved tentatively, pushing out into the pond. No gurgling noises behind me. My knees were still dry; not a drop of water inside. The canoe moved easily, responding to every little gesture from the paddle. I came about, exultant, and thrust the paddle deeply.

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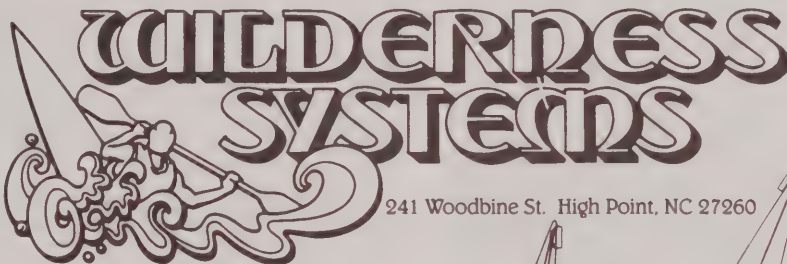
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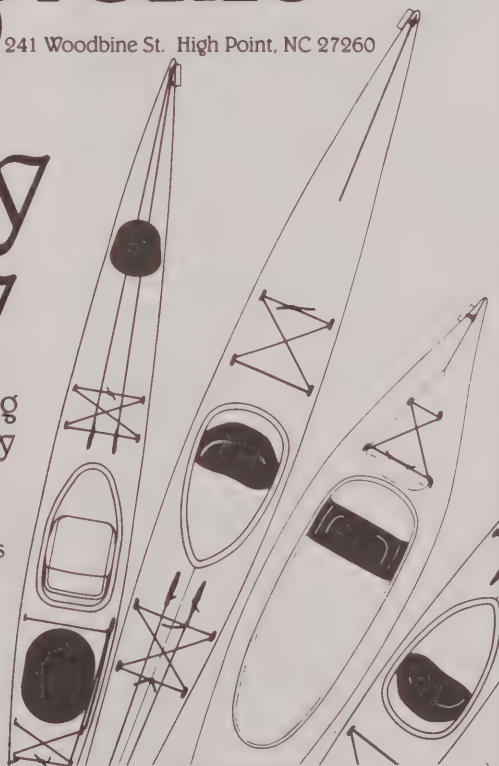
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“Yes, We Sailed This Boat To Grand Manan”

Now *that* got my attention! Not that a chance for my first close-up look at what proved to be an *Elver* wasn't enough to get my attention. Or that any wood sailing vessel, tarted up like a miniature privateer (gun ports and all), wouldn't make me flat-spot the tires of the family wagon in order to catch the turn onto to the wharf road.

But someone casually remarking that they'd sailed this diminutive boat from Belliveau's Cove, Nova Scotia, across the Bay of Fundy, to Grand Manan - well it just makes you perk up your ears and take notice!

My first look at *Art's Craft*, the name of this particular *Elver*, convinced me that there were some new and interesting characters lurking about the neighborhood. She was tied to the wharf in Belliveau's Cove - “takin' the hard” in one of those harbors that our world famous Fundy tides leave dry several hours a day. When I pulled up, her people were nowhere to be seen...all the better to have an unabashed look at the boat. Some boat, too!

She was yawl rigged, with a sprit main, flying jib, and a standing lug mizzen - tanbark sailcloth all around. A stout bowsprit stood aggressively from her bow, without benefit of a bobstay. She had big-ship shrouds, with ratlines, crimson baggywrinkle, deadeyes, and all like that. The overall shape said *Elver*, but there was a full-length plank keel that I didn't remember from Mr. Redmond's study plan, and a steering wheel, rather than a tiller. Then too, there were all those simulated gun ports, and a proper Jolly Roger, with the eyes cut right out of the cloth.

In addition to the jaunty cuteness, that row of false ports gives this *Elver* a different look than the one in the familiar ads. The eye is fooled by the broad band of the ‘gun deck’, creating the illusion of less freeboard than the standard model.

Here was the quintessential ‘character boat,’ and I resolved to meet the characters who owned her.

Some discrete snooping revealed that the characters were living in a pick-up camper, right there on the wharf. They were Art and Lena Burridge, a couple based in the Canadian Pacific coast province of British Columbia, and

currently enjoying their retirement by traveling across the U.S. and Canada, lugging their mini-cruiser along with them. When we finally met, I learned that Art was the one with the nautical background and yearnings, and the builder of *Art's Craft*. Lena was press-ganged into service as mate when the boat was finished and it was time to go cruising.

Luckily - for the sake of their marriage - she took right to it, in spite of a rather exciting first sail on Lake Ontario. Though a bit less bold than Art, when it starts breezing on and getting a bit hubbly, Lena has nevertheless logged a lot of sea time, beginning with a two and a half month stretch of live-aboard cruising in their tiny craft. The camper was left behind while they toured Lake Ontario and the New York river and canal system.

This trip began in Hamilton, Ontario, continued along the north shore of Lake Ontario, on into the St. Lawrence River, to Sorel, Quebec, where they turned down the Richelieu River into New York, on to Albany, the Finger Lakes, the Erie Canal, the Thousand Islands, then through the Welland Canal and back to Hamilton. The adventures included a big breeze ‘o wind just out of Hamilton, a rudder failure, a near-collision with a draw-bridge that didn't draw when it should have, some exciting moments in the canal locks, and a near-stranding in the eel grass of the Erie Canal.

It is difficult to appreciate what a ‘feat’ this was until you've gone into the cabin and sat on *Elver's* bunk. At 5'9", I can't sit completely upright in there; Lena can, but Art is a hair over six feet tall! The rest of the accommodations are scaled accordingly (though *Elver* has an enormous cockpit for so small a boat). People who are attracted to the “...sleeps 6 with, full standing headroom, on a 25' waterline” kind of boat would be horrified.

It is evidence of their compatibility that the Burridges could travel, cook, relax, tend ship, sleep, manage the details of...er...uhm...personal hygiene, and generally get along cheerfully for that length of time in such confined quarters. Regular visits to marinas, to shower and do laundry, helped.

This is not to fault the boat or her accommodations. As a camp cruiser, *Elver* is a great

success, particularly as rendered by Art. Her cabin is as snug and cozy as you'd ever want. There's a comfy double bed that would do honeymooners proud. Art designed and had cast a suitably scaled ship's stove (an 8" x 8" x 18" beauty, with rope-motif flourishes and a miniature Charlie Noble), so you can have a proper fire to take the edge off the chill or damp.

A couple of lift-off ventilation hatches allow you to stand and stretch, check to see that no one's dragging anchor and carrying down on you, or just admit a blast of fresh air. There's a wee foc'sl with surprising storage space.

Large walk-in doors allow easy access ‘below’ (though if I were building one to go adventuring in the Bay of Fundy, I'd have a bridge deck abaft the cabin, hatch and drop boards, and live with the contortions required to get in and out).

As a camp cruiser, she's about all you could expect or ask for on a 18' 1" waterline (20' 0" length on deck). But I doubt that Steve Redmond expected people to cruise and live aboard an *Elver* for two months or more. Then again, he probably didn't expect people to be sailing *Elvers* across the Bay of Fundy either.

Of course, Art Burridge is not just average people; he's well suited, by experience, for his present occupation. Born in Bear River, Nova Scotia, and raised on Grand Manan, Art's first job, as a 14 year old, was as mate on a coastal schooner during the Great Depression. In this capacity, he got to know the ways of a ship and the waters around Grand Manan, as well as the waters from Narragansett Bay, on up the East Coast, to most of the Bay of Fundy ports.

Lena has an interesting background as well, having been raised on a farm-ranch, in California, and grown up tending grapes and other crops. She left the farm for a thirty year career in health services, and was living in a rural area about 40 miles from Yosemite National Park when she and Art met. This was where construction of *Art's Craft* began. Between the two of them, they can fill several evenings with interesting yarns, without any repetitions.

Though Art left the marine trade, for a hitch in the Canadian Army during W.W. II, and then to pursue a career in teaching (including one of the first Outward Bound courses given in Canada) and financial services on shore, he never lost his love of the outdoors, the smell of fresh salt air, and the joy of a sailing vessel working the winds.

In comfortable retirement, with the blessing of good health, and recently married to Lena (after 17 years as a bachelor), the urge to mess about in a boat was rekindled while browsing through a yellowed issue of National Fisherman, kept - goodness knows why - for several years after it was purchased.

Stumbling across the photo and advertisement for *Elver*, Art sent for the study plan, and shortly thereafter the full building plans - like so many dreamers and fantasizers (in excess of 500, according to Steve Redmond). Unlike a good many of the others, he decided to build *Elver*, and saw the project through to completion. He now has a whole new handle on this retirement business.

A lot of experience and personal preferences went into *Art's Craft*, and a lot of tee-hee-heeing as well (there's a brass canon in her future, which ought to make everyone *really* notice those gun ports). Steve Redmond actively encourages builders to make his boat their own by customizing the interior, using

alternate planking methods (she'd be a lovely job to plank lapstrake), and generally "showing off in style." I think he'd be quite tickled with this piratical variation on his basic theme.

Like any small wooden boat, *Art's Craft* gets tinkered with on a regular basis. Her finish - stylistic flourishes notwithstanding - is basic fisherman, and she is used as a fishing platform quite regularly. Plain paint, in basic colors, applied as needed. Freedom from care and obsessiveness about upkeep are the goals. She's not a boat in which you cringe in shame if a bit of coffee slops into the cockpit in a seaway.

Though she's a prodigious cruiser - on the trailer or in the water - providing pleasure and satisfaction as a boat, there is one characteristic of *Art's Craft* that is particularly appreciated by her owners: she never fails to attract other interesting characters. Art and Lena both agree that this is the thing they enjoy the most about their boat; wherever she goes, *Art's Craft* is a magnet for fascinating, gregarious, enthusiastic, unpretentious, and generous people.

She's been the stimulus to many invitations to home cooked meals. The Burriges have been lugged off to markets, or laundromats, or gas stations, by any number of people who would ordinarily be 'too busy' to help out strangers. Her funkyness keeps away those with yachty - and perhaps some other - pretensions; her salty cuteness attracts just the sort of folks that Art and Lena enjoy sharing a mug of tea and a few yarns with.

You won't visit with them for long before there's a mug of hot tea and some tasty treats on the table. And there are a lot of yarns. Art has the raconteur's gift, and Lena will usually give him center stage. But, get past her initial reserve, and Lena has her own tales to tell.

All in all, it's a pretty swell life they've fashioned for themselves. With their snug little boat, and their equally snug little camper, the Burriges travel about in self-contained independence. Camped out on the wharf, with a spectacular view of St. Mary's Bay on one side, and *Art's Craft* safely moored on the other, could you describe their set up as anything other than idyllic?

Right from the top: A cruiser in the water and a camper on the wharf. Is this the life, or what? (Phillip Beliveau Photo). That's a lot of skipper for such a tiny cabin! Two lift-off hatches admit light and fresh air. They are nice places in which to stand and watch the boat go too. Below: Two compasses! This is a camp-cruiser?

As for the trip to Grand Manan, *Art's Craft* really did that. (This ought to have Mr. Redmond checking with his lawyer about any implied liability incurred by designers of boats.) The crossing was uneventful, apart from making her landfall through the Bulkhead Rip - a notorious access route - which got the attention of the local fishermen, a few of whom remembered Art from his days on the island. A few even asked if he still did a bit of deer hunting, an avocation Art pursued with considerable - not to say excessive - zeal in his youth.

Art allowed as how it had breezed up a bit more than he'd have preferred, on the return leg, but *Art's Craft* nonetheless made the crossing in comfort and with minimal anxiety on the part of her people (in spite of experiencing her second rudder failure). *Art's Craft* stood up to her rig (reduced to jib and jigger in the heavy winds), and rode the waves like a duck. He observed that the working 40' Cape Islanders seemed to be having a rougher time of it. Having thus tested his little ship, Art has every confidence in her ability to take whatever the seas he wishes to travel on can dish out.

Pretty soon, they'll haul her out. *Art's Craft* will spend the winter here in Nova Scotia. Art and Lena will wander back to their home in British Columbia, with side trips to visit friends and family in Arizona, California, and Washington state, and other places with fresh air, warm sun, and good fishing.

Come summer, they'll be back. Like many in a steadily growing circle of friends and slightly envious admirers, I'll be eager to see them back. Eager to catch up on their latest yarns and adventures. And eager to see the little black ship tugging against her mooring lines, just below the lighthouse, or heading out into the Bay to terrorize the mackerel.

Report & Photos by Ernie Cassidy.
(Ernie Cassidy messes about in small boats on the "French Coast" of Nova Scotia on the Bay of Fundy, and has just acquired an 18' Atkin "Bluebird" sloop for the purpose.)



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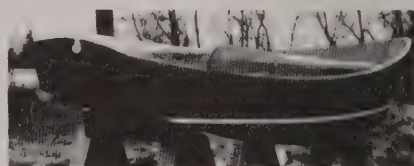
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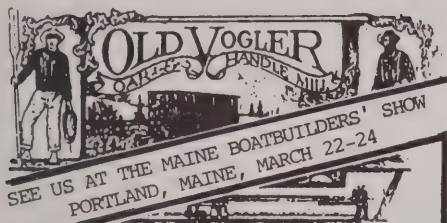


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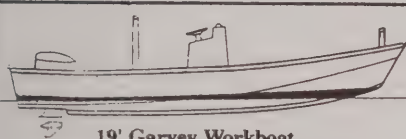
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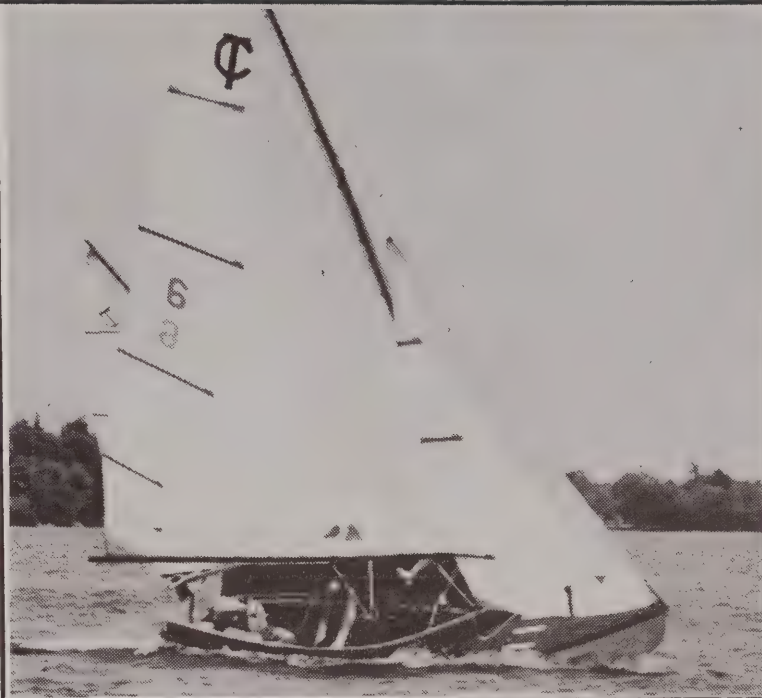
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Dan and Hedda Leonard spent a lot of time last summer at the small boat builder shows, I met them at Albany, again at Lake Champlain, and then again at Strawberry Banke. Often Dan would be found sitting comfortably on a beanbag cushion in the spacious rear cockpit of his "Goshawk" sailing kayak. Or is it a paddling sailboat? The "Goshawk" was why the Leonards were doing the boat show circuit, Dan's ideas formulated from paddling and sailing large double kayaks had come to fruition with this unique craft.

Building the "Goshawk" is not yet Dan's livelihood, this boat is the result of heeding that urge to improve or create a better small boat than one can buy, an urge many of us share. As paddler (and this coming summer, sailor) of a large Folbot double, which I regard as analogous to a travel van rather than a sports car, I was drawn to Dan's creation. My, it looked complicated at first, with its schooner sail rig and all its strings to pull, its four leeboards, and its many details for making cruising in an 18' cartop craft for two not only possible, but comfortable.

Ah, comfort. The attractions of the kayak can be offset by the relative restriction on one's movements that the design imposes. Even the spacious Folbot has limited opportunity for moving about within it. The "Goshawk", with 18'

WindHorse Marine— GosHawk

waterline and 38" beam, is incrementally larger than the Folbot, but this results in much more room for not only the crew, but all their gear for an extended cruise. All day armchair comfort is achieved with the beanbag cushions and reclining seat backs. No wonder Dan looked so at ease sitting there.

What about those four leeboards? Since I saw them last summer, Dan has redesigned the setup, after receiving advice from sailing canoeists, and now has but one, pivoted below the deckline to be out of the way of paddling. The original concept was to provide greater trim adjustment possibilities under sail, and yet clear the side decks for paddling. Overkill, perhaps. It did contribute to the busy look of things then.

Dan now has his own sail rig design in place. The earlier version used the fully battened Batwing sails of Mark Balogh. Total sail area is still 82 square feet in three sails; a 36 sq. ft. mizzen, 20 sq. ft. staysail main, and 30 sq. ft. genoa jib. The two forward sails

can be roller furled from the cockpit now, a main reason for the redesign. The mizzen carries a single reef. The forward crew member can sit out on a decktop seat to either side to counteract heeling moment if necessary when it breezes up, but in normal conditions, both remain seated in those comfy beanbags.

The "Goshawk" looks like a kayak, but it really has to be viewed as a sailboat. The provision for paddling is the auxiliary, the boat is meant to be sailed whenever conditions permit. As an 18' daysailer, it has some very attractive features. Unrigged it weighs about 100 pounds, easily cartopped on a compact car, lifted into place by the two person crew it requires anyway. Fast to set up, it is soon afloat anywhere a carry-in access to the water exists. It can be beached anywhere there's a flat spot on the shore. It carries all the camping gear a couple could need. Dan and Hedda spent a week on Moosehead Lake after the summer boat shows testing his revised version, and a couple of days on the Maine coast trying it out in a seaway and higher winds. He comments that "since then, we've been much less concerned about venturing out into relatively demanding conditions."

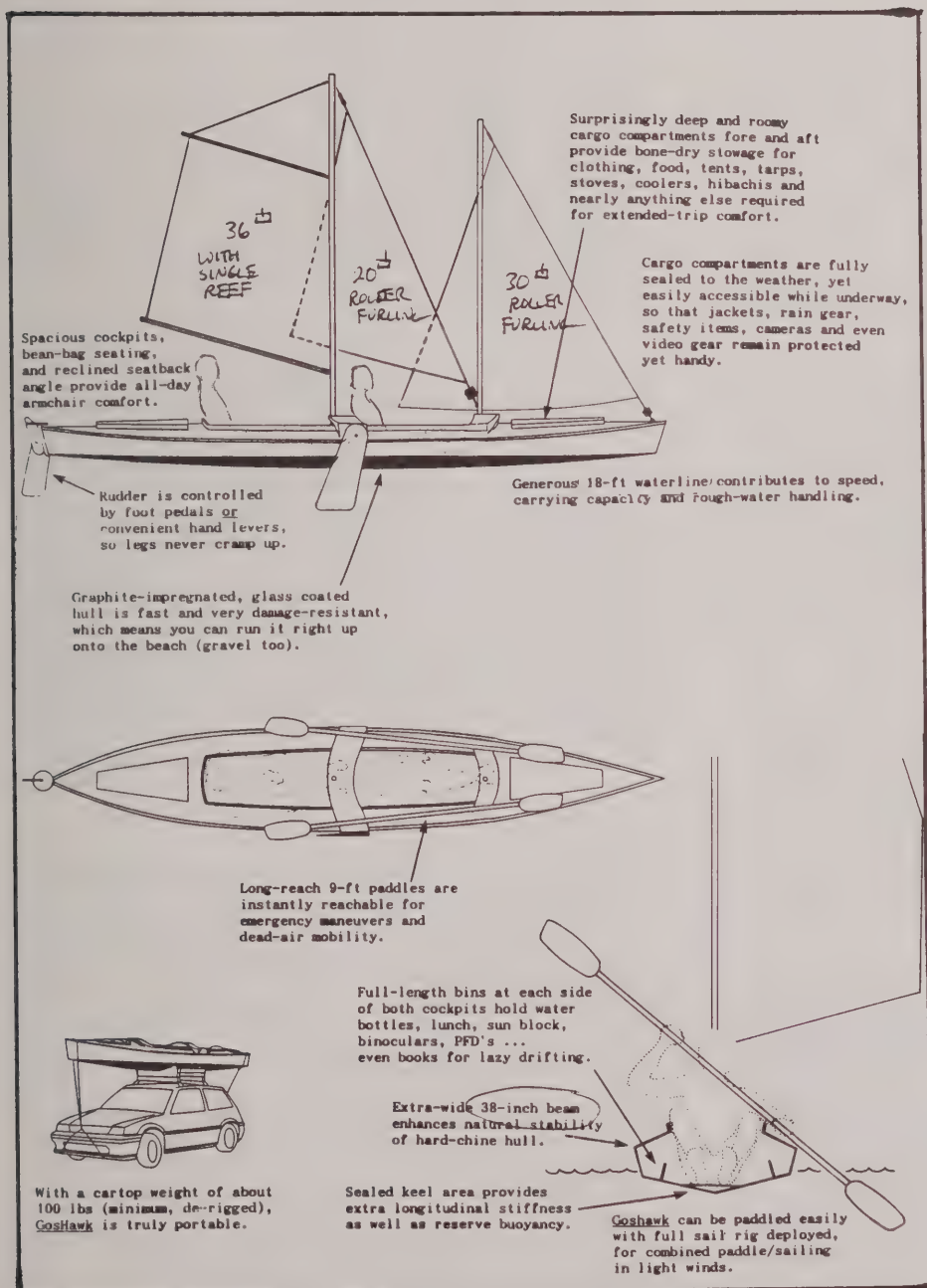
Dan will build a "Goshawk" to order, and the price is in the day-

sailer, not kayak, range, with the completely equipped boat ready to shove off offered at \$6,800. The concept deserves close inspection from anyone interested in a unique approach to daysailing, camper cruising, and kayaking, all in one package. Dan operates as Windhorse Marine at 91 Library Rd., South Britain, CT 06487, (203) 264-7765.

Report by Bob Hicks

Photos by Dan Leonard & Bob Hicks

Right: Dan relaxes on one of those beanbag cushions at a boat builders' show last summer. The original four-leeboard setup had not yet been replaced, and the boat still sported the BSD main and mizzen, and Dan's home made genoa jib.



WindHorse
Marine

CHAPTER VIII

(Continued)

THE LANDLUBBER'S CHAPTER

Common Nautical Terms and Expressions Defined—How to Sail a Boat—Boat Rigs—Rowing—clothes—How to Make a Bathing-suit—How to Avoid Sunburn

To Reef Without Lowering Sail

It sometimes happens that on account of the proximity of a lee shore, and the consequent danger of drifting in that direction, or for some other equally good reason, it is inadvisable to lower sail and lose headway. Under such circumstances the main

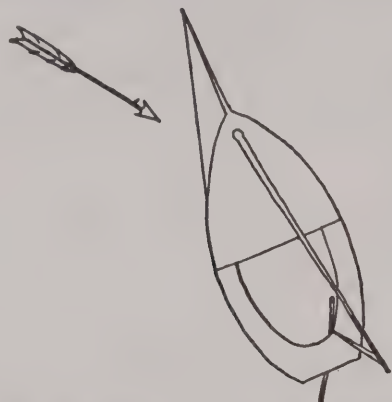


Fig. 138.—Squirming; jib on port side, boom close-hauled on starboard side.

sheet must be trimmed flat, keeping the boat as close as possible to the wind, the helm must be put up hard a-lee, and jib-sheet trimmed to windward (Fig. 138).

When this is done the wind will hit the jib, "paying her head off," or pushing her bow to leeward, and this tendency is counteracted by the helm and mainsail, bringing the bow up into the wind. This keeps the boat squirring. Lower the mainsail until the row of reef points is just on a line with the boom, keeping to the windward of the sail. Tie the first point—that is, the one on the luff rope—then the one on the leach, being careful to stretch out the foot of the sail. Then tie the remaining points, always making a square or reefing knot. Tie them to the jack-stay on the boom or around the boom.

The Reef or Square Knot

is most frequently used, as its name implies, in reefing sails. First make a plain overhand knot, as in Fig. 139. Then repeat the operation by taking the end and passing it over and under the loop, drawing the parts tight, as shown in Fig. 140. Care should be observed in crossing the ends so that they will always lay fairly alongside the main parts. Otherwise the knot will prove a *granny* and be comparatively worthless.



Figs. 139 and 140.—
Square or reef knot.

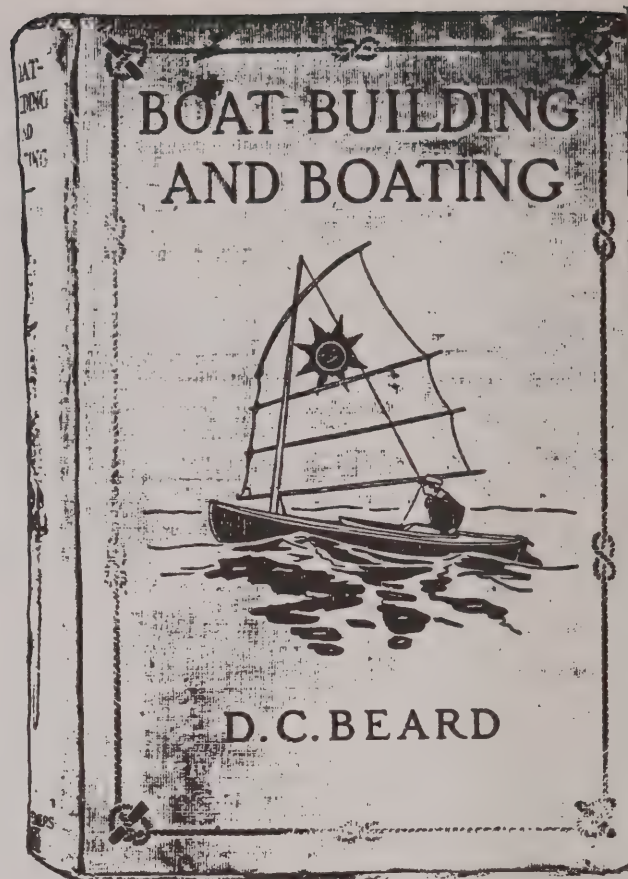
To Shake Out a Reef

untie the knots, keeping to the windward of the sail. Untie the knot at the leach first, next the one at the luff, and then the remaining points. In lowering a sail you use a rope called the downhaul.

Starboard Tack.—When the main boom is over the port side.

Port Tack.—When the main boom is over the starboard side.

Right of Way.—All boats sailing on the starboard tack have the right of way over all those on the port tack. In other words, if you are on the starboard tack, those on the port tack must keep out of your way. Any boat sailing close-hauled has the right of way over a boat sailing free.



Lights for Canoe

A canoe under sail at night should have an uncolored lantern hung to her mizzen-mast to notify other craft that she is out and objects to being run down. The light is put on the mizzen so that it may be behind the skipper and not dazzle him.

What you have read in the foregoing pages will not be found very difficult to remember, but there is only one way to learn to sail and that is by *sailing*. If possible, sail with some one who is a good seaman. If this sort of companion cannot be had, try it alone on smooth water and with short sail until you accustom yourself to the boat and its peculiarities. No boy ever learned to skate or swim from books, but books often have been helpful in giving useful hints to those who were really learning by practical experience.

Some Do Nots

- Do not overload the boat.
- Do not carry too much sail.
- Do not sail in strange waters without chart or compass.
- Do not forget your anchor.
- Do not forget your paddles or oars.
- Do not attempt to learn to sail before you know how to swim.
- Do not sit on the gunwale.
- Do not put the helm down too suddenly or too far.
- Do not let go the helm.
- Do not mistake caution for cowardice.
- Do not be afraid to reef.
- Do not fear the ridicule of other landlubbers.
- Do not fail to keep the halyards and sheets clear.
- Do not jibe in a stiff wind.
- Do not fail to keep your head in times of emergency.
- Do not make a display of bravery until the occasion demands it.
- Do not allow mistakes or mishaps to discourage you.
- Do not associate with a fool who rocks a boat.

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It is Necessary to Learn to Swim

From the parents' point of view, nowhere that a boy's restless nature impels him to go is fraught with so much peril as the water, and nowhere is a boy happier than when he is on the water, unless it is when he is in it. Nowhere can be found a better school for his young mind and body than that furnished by boating. Hence it appears to be the imperative duty for parents personally to see that their children are taught to swim as soon as their little limbs have strength enough to make the proper motions.

Boating-Clothes

In aquatic sports of all kinds, if you expect to have fun, you must dress appropriately. You should have a suit of old clothes that you can change for dry ones when the sport is over. When boating, it is nonsense to pretend you can keep dry under all the varying conditions of wind and weather. If your purse is small, and you want a good rowing-suit, it can be made of last winter's woollen underclothes, and will answer for the double purpose of rowing and bathing.

How to Make a Bathing-Suit

First take an old woollen undershirt and cut the sleeves off above the elbows. Then coax your mother, aunt, or sister to sew it up in front like a sweater, and hem the edges of the sleeves where they have just been cut off.

Next take a pair of woollen drawers and have them sewed up in front, leaving an opening at the top about four inches in length; turn the top edge down all around to cover a piece of tape that should be long enough to tie in front. Have this hem or flap sewed down to cover the tape, and allow the two ends of the tape to protrude at the opening in front. The tape should not be sewed to the cloth, but should move freely, so that you can tighten or loosen it at will. Cut the drawers off at the knees and have the edges hemmed, and you will have a first-class bathing or rowing-suit.

If woollen clothes are not to be had, cotton will do, but wool is coolest and warmest, as the occasion may require.

When rowing wear old socks, woollen ones if you have them, and old shoes cut down like slippers. The latter can be kicked off at a moment's notice, and, if lost, they are of no value, and may be easily replaced.

When on shore a long pair of woollen stockings to cover your bare legs and a sweater to pull over your sleeveless shirt are handy and comfortable, but while sailing, paddling, or rowing in hot weather the rowing-suit is generally all that comfort requires. Of course, if your skin is tender, you are liable to be terribly sunburned on your arms, neck, and legs; but

Sunburn

may be avoided by gradually accustoming your limbs to the exposure. Dearly will you pay for your negligence if you go out for a day with bare arms or legs in the hot sun before you have toughened yourself, and little will you sleep that night.

I have seen young men going to business the day following a regatta with no collars on their red necks, and no shirt over their soft undershirts, the skin being too tender to bear the touch of the stiff, starched linen, and I have known others who could not sleep a wink on account of the feverish state of their bodies, caused by the hot sun and a tender skin. Most boys have had some experience from sunburn, acquired while bathing. If care is taken to cover your arms and legs after about an hour's exposure, you will find that in place of being blistered, your skin will be first pink and then a faint brownish tint, which each succeeding exposure will deepen until your limbs will assume that dark, rich mahogany color of which athletes are so proud. This makes your skin proof against future attacks of the hottest rays of the sun.

Besides the pain and discomfort of a sudden and bad sunburn on your arms, the effect is not desirable, as it is very liable to cover your arms with freckles. I have often seen men with beautifully bronzed arms and freckled shoulders, caused by going out in their shells first with short sleeves and then with shirts from which the sleeves were entirely cut away, exposing the white, tender shoulders to the fierce heat, to which they were unaccustomed.

It is a good plan to cover the exposed parts of your body with sweet-oil, vaseline, mutton-tallow, beef-tallow, or lard. This is good as a preventive while in the sun, and excellent as an application after exposure. Any sort of oil or grease that does not contain salt is good for your skin.

Clothes for Canoeing

In canoeing I have found it convenient to dress as I would in a shell boat, but I generally have had a sweater and a pair of long trousers stowed away, ready to be pulled on over my rowing-clothes when I landed. Once, when I neglected to put these extra clothes aboard, I was storm-bound up Long Island Sound, and, leaving my boat, I took the train home, but I did not enjoy my trip, for the bare legs and arms and knit cap attracted more attention than is pleasant for a modest man.

Do not wear laced shoes in a canoe, for experience has taught boating-men that about the most inconvenient articles of clothing to wear in the water are laced shoes. While swimming your feet are of absolutely no use if incased in this style of foot-gear, and all the work must be done with the arms. But if you have old slippers, they may be kicked off, and then you are dressed practically in a bathing-suit, and can swim with comfort and ease.

Possibly these precautions may suggest the idea that a ducking is not at all an improbable accident, and it must be confessed that the boy who thinks he can learn to handle small boats without an occasional unlooked-for swim is liable to discover his mistake before he has become master of his craft.

Stick to Your Boat

Always remember that a wet head is a very small object in the water, and liable to be passed by unnoticed, but that a capsized boat can scarcely fail to attract attention and insure a speedy rescue from an awkward position. As for the real danger of boating, it cannot be great where care is used. Not one fatality has occurred on the water, among all of my large circle of boating friends, and personally I have never witnessed a fatal accident in all the years I have spent rowing and sailing.

Life-Preservers

All canoes should have a good cork life-preserver in them when the owner ventures away from land. I never but once ventured any distance without one, and that is the only time I was ever in need of a life-preserver. The ordinary cork jacket is best. It can be used for a seat, and when spread on the bottom of your canoe, with an old coat or some article thrown over it for a cushion, it is not at all an uncomfortable seat. Most canoes have airtight compartments fore and aft—that is, at both ends—and the boat itself is then a good life-preserver. Even without the airtight compartments, unless your boat is loaded with ballast or freight, there is no danger of its sinking. A canvas canoe, as a rule, has enough woodwork about it to support your weight when the boat is full of water.

An upset canvas canoe supported me for an hour and a half during a blow on Long Island Sound, and had not a passing steamer rescued me, the canoe would evidently have buoyed me up as long as I could have held on to the hull.

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From the Boat Shops

FEATHER CANOES

Here in Florida when summer comes it gets hot and muggy with frequent thunder showers. The sun really bears down and bugs can be a real problem when camping or picnicking. So in the summer I tend to spend more time in my shop and less paddling on the local streams, although I continue to row for exercise early mornings before the sun is up too high.

Most readers will never have the opportunity to drop by my shop for a visit, so I thought I might describe to you all the place where I build my version of the "Wee Lassie" canoe and a wide variety of other canoes and rowing shells.

I have always admired people who have immaculate shop areas, who keep everything neatly stored in cabinets, and whose floors stay vacuumed and scrap lumber neatly stacked. I have never had that kind of shop. I guess I'm just not that kind of a person. My wife says I love clutter, and she is right. She usually is...

My shop is about ten minutes drive from any water. Boat builders usually can't afford waterfront property in Florida unless they moved here long before I did. The shop is on Highway 301, which is a busy route just north of downtown Sarasota, and about ten minutes drive from I-75. This is an asset because I usually have a canoe right out by the edge of the road, and you can't beat that for free advertising. It also lets people know I am at the shop when it is out there. I spend about half my time building canoes, the rest I spend working for a local building contractor.

The shop itself is small, only 600 square feet, but there is a loft across one side that lets me store finished and unfinished canoes up out of my way. Right now I have two rowing shells, a dinghy and three canoes stored up there out of my way. The shop has a big over-

head door that opens the whole shop to the outdoors, which is paved for parking. I have a nice tree across from my area which is well populated with sparrows waiting for handouts. Every day I feed two pigeons, dozens of doves and a whole tribe of sparrows. Each spring a family of cardinals adds a splash of color to the scene.

I have had this shop for about ten years now and I have to admit that the clutter gets ahead of me (has gotten ahead, way ahead...). I use three building boards, on casters, and two carts on wheels, which allow me to move boats outside, either to make room or to do heavy sanding out in the fresh air. No matter how cold or hot it gets, my overhead door is always open.

Around two sides of the shop are work benches with cabinets beneath in which to hide some of the clutter. A pegboard above is where I hang tools I use the most, along with sanding boards, clamps, clamps and more clamps, and miscellaneous chisels, planes and drill bits. Also on, beneath, or above these benches are the extension cords, bevel gauges and other things one can accumulate in ten years in one place, with a whole lifetime of working with tools for a living giving it momentum. Power tools are stored in drawers and cabinets, the ones I use the most getting the preferred locations.

I have one area where I mix the epoxy, which has everything I need for that operation right there. Gloves, spreaders, mixing sticks, all sizes of cans, fillers, brushes, pads, roller handles and covers are all there. Any wall in the shop that is not covered with pegboard and tools is covered with poster-sized pictures of Trussum Pond and Alexander Springs, half models of canoes and all kinds of sailboats, with my favorite being a big half model of a Chinese junk, sails and all.

Wood seems to accumulate. Strips left over from each canoe I build; long lengths of cherry for rails; two by fours and two by sixes of red cedar waiting to be ripped into strips; short pieces of teak, oak, mahogany, cherry and birch. I work on the principle that the piece of wood you throw away today is the exact piece of wood you need tomorrow. Sometimes it gets out of hand and I will fill up the dumpster outside with scrap, even though it breaks my heart to do it.

Then there are the paddles and oars. All kinds. Bent shaft, traditional, quills, double paddles, feathered, unfeathered, experimental paddles that didn't work, and some that did. Oars for my rowing shells and oars for my dinghy are all there.

And out in the middle of all this I have three areas to work in. I have one building board permanently set up for the "Wee Lassie" canoes; another board set up for the "Arkansas Traveler", which is really just a big "Wee Lassie"; and a third area where I do the odd custom jobs that come along. Right now I have in that area an International 10 meter sailing canoe that I have been working on intermittently for the last three years. The hull shell is finished and I'm now working on the centerboard case and decks.

The floor gets swept out two or three times a week, but this isn't an easy process, as the floor after ten years has a texture all its own. You don't trip when you walk on it, but not much of the original concrete is still visible, being well covered with epoxy drips and glue drips and varnish spills from over 100 boats, to say nothing of all the paddles, oars, seats, decks and spars that have been made here.

It is a well lived-in shop, comfortable for me. I can be eating my lunch and the pictures on the



walls instantly transport me to Trussum Pond for a short paddle in a nice daydream...

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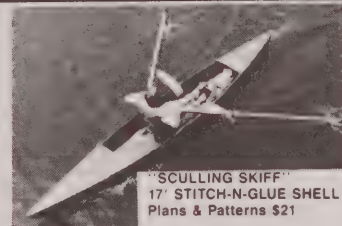
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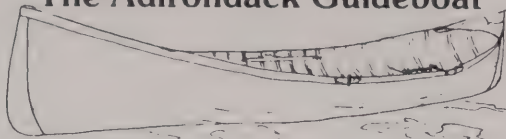
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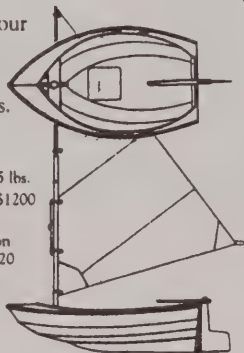
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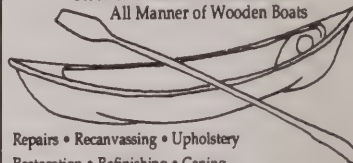


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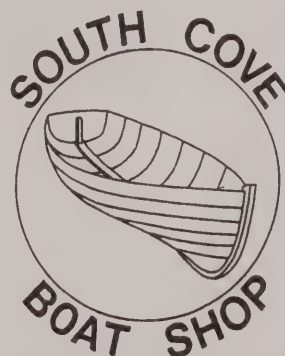
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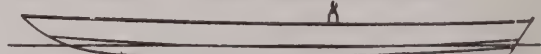


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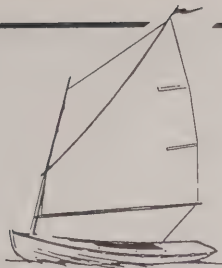
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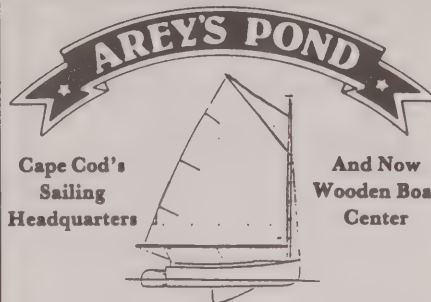
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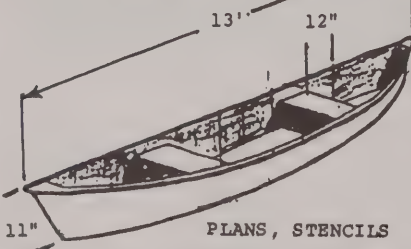


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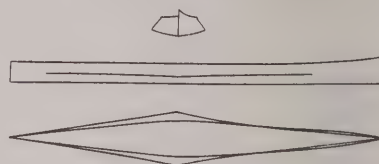
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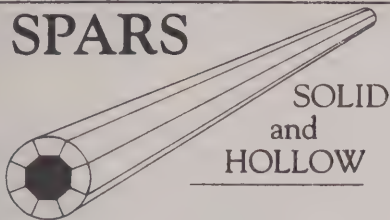
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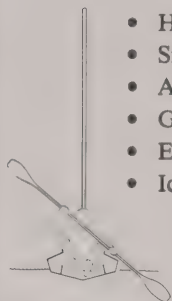
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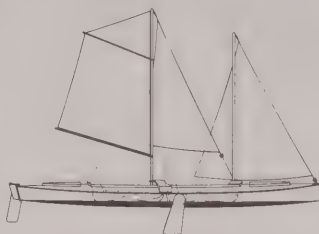
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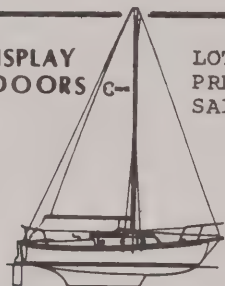
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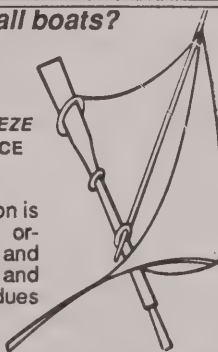
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KEY LARGO SHOAL WATER CRUISES, Key Largo, FL, (305) 451-0083. (TF)

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WARREN GRUNST, Oak Ridge, TN, (615) 482-2010. (20)

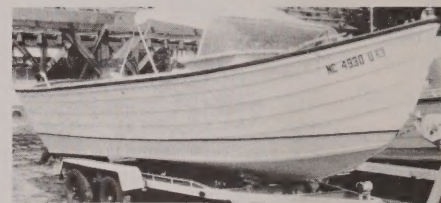
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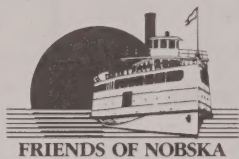


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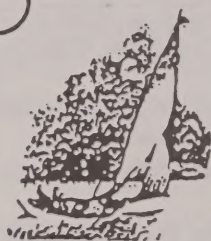
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