A BETTER WOODEN BOAT?

LEWIS H CLINE

Chuck out your clumsy oak frames and corrosive fastening, forget your expensive veneers and moulded planking; the Cutts Method is here. Using Kevlar fibre inserted into the structure of the hull, an American boatbuilder has devised an innovative new method of building boats. Lila Line reports

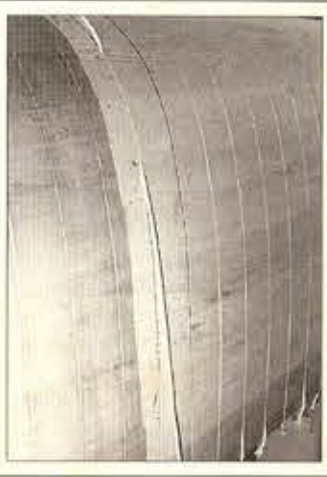
An American yacht designer and builder of wooden boats has introduced a new technique of hull construction that many predict will revolutionise the craft of wooden boatbuilding. Edmund A Cutts, aged 67, of the Cutts & Case Shipyard in Oxford, Maryland, has a long history of maritime traditions. He has developed a method that enables the boatbuilder to forego the use of frames, rivets, fastenings, caulking, and other materials normally used to keep a hull together. Widely admired for his turn of the century craftsmanship, Ed has patented the technique he calls the Cutts Method.

The concept is surprisingly simple, and Ed is convinced that boats built by his method and combined with sound craftsmanship will require no more maintenance than the average glassfibre vessel and could last well beyond 100 years. Like most builders of wooden boats, he was frustrated by cracked seams, eroding screws, and space stealing structure. "I'm an innovator, anything I find hard to do, I think, 'My God, there's got to be a better way'," says Ed. He had long dreamed of making a better type of wooden boat. He knew that if not built well and maintained constantly, seams on wooden boats leak and require recaulking, bronze screws in time disintegrate in salt water, weakening the boat's structure, and he claims most frame breaks occur during building. All these problems show up sooner or later even in the best built boats.

Ed's method of building offers unlimited possibilities to designers and builders of custom boats. The technique furnishes the highest strength, lowest weight, and a significant reduction in labour over traditional methods of boatbuilding. The method has been used for several years, and has been granted patents covering its use for any type of structure — yachts, aircraft, and architectural framework.

The procedure involves the use of cords of Kevlar synthetic fibre, processed specially for this method. Kevlar was developed by the DuPont Company of Wilmington, Delaware, for use in space age rocket hardware, and has the tremendous strength properties now required for Army helmets, flack jackets and reinforced aircraft parts. By weight, Kevlar has 11 times the strength of steel, is ordinarily non-biodegradable and has a half life of over 2,000 years. Hulls built by the Cutts Method are produced without metals of any kind and are therefore electrically inert. According to Ed, the metallics are among the weakest areas of a boat. The super high tensile cords totally eliminate the need for the usual wooden boat framework. When correctly designed with proper structural cabinetwork and bulkheading, the structure in function is quite similar to its glassfibre counterparts and is lightweight

Above: *The hull of the 27-foot runabout* Curio, *built using the Cutts Method. The Kevlar strips have been inserted into the first layer of planking and the second layer is being fitted. Temporary fastenings are removed and the holes filled with epoxy.*
Right: *A hull in progress, showing the first layer of planking with grooves cut into it and Kevlar strips inserted. Note the tight fit of the seams.*
Opposite page. Top: *The stern of the skipjack-inspired* Hummingbird *showing the first layer of planking, with the Kevlar epoxied into place at right angles to the planking.*
Bottom: *A cutaway section of a Cutts hull from a promotional leaflet.*



EDDIE CUTTS JNR

A NEW WORLD INNOVATOR

The shipyard of A Cutts, in what is now Kittery, Maine, was founded in 1646 by John Cutts, whose family has been traced to Stratford-upon-Avon in England. It is thought to have been the earliest shipyard in the New World. Generations later, Ed Cutts' father was still in the woodworking business, making light carriages, caskets, fancy woodwork and stairways for mansions on the Gold Coast of New York. Ed was born in the Queens borough of New York City, and began his boatbuilding career sailing cardboard boats along flooded curbings, catching them before they hit the sewer drain!

PAINTING BY RICHARD HARRYMAN

One day Ed happened to be in Marblehead, Massachusetts, where L Francis Herreshoff lived. He stopped in to see the yacht designer and was greeted cordially. That meeting began a long friendship and association that lasted until Herreshoff's death some 28 years later.

Francis Herreshoff recommended him to Boris Lauer-Leonardi, then editor of *Rudder* magazine, telling him that Ed's models were the best that had ever been brought to him for evaluation. Lauer-Leonardi ordered a boat built from his designs and followed up by ordering two more designs; one power and one sail.

In the meantime, John Case had told Ed that he had always wanted to own a boatyard. When Case learned there was one for sale in Oxford, Maryland, he contacted him. "As soon as we saw it, we fell in love with it, it was such a beautiful place, the sway-back building shed, the little old cottage, just the whole thing. It was run down badly, everything was falling apart, but it was a layout of exactly what we thought of as our kind of paradise. We still love it," explains Ed. The house they occupy is the oldest in Oxford, a small 'English' cottage, circa 1668.

Above: *An idyllic scene on the Chesapeake. Ed bought the yard in 1965 and has lived there ever since.*
Right: *Amid a set of moulds set up for a 65-foot motor boat, Ed Cutts reveals his secret ingredient.*
Far right: *Pool trials... A 14-foot rowing boat built using the Cutts Method.*

LILA LINE

Ed and John Case bought the shipyard in 1965. In 1988, Ed bought his partner out, though the yard still carries the two names. It now employs up to 15 workers. Maggie Cutts has always kept the books, and both of their sons, Eddy Jr and Ron, are in business with their father. A daughter, Linda lives on the Chesapeake's western shore.

Ed's office is a land based houseboat moved to Cutts & Case Shipyard 66 years ago by its founder, Ralph Wiley, also a New Yorker. Wiley lived aboard the houseboat in the nearby creek before bringing it ashore. Later, he bought Byberry House, the oldest house in town and had it moved to its present site.

Ed and Maggie Cutts have lived in the house for 30 years. Reminders of Ed's love for wooden boat building are everywhere. Walking into the living room is like walking into the cabin of one of the boats the shipyard is so famous for building. Polished half models of Ed's designs cover the walls under the carved beams and hanging knees of the ceiling itself. A dining room cabinet came from Nat Herreshoff's steel racing schooner *Ingomar* which once stopped at the shipyard for repairs. She is best remembered for the season of 1904 when she did so well racing in English and German waters that the Kaiser ordered a large schooner for himself from Herreshoff.

It's the first Sunday after Christmas. As Canada geese honk greetings before landing on the creek, swans and ducks feed in the shallows in front of a large expanse of windows in the office. Bent over a designer's desk, Ed is sketching a pen and ink section of a boat that a man fom Norfolk, Virginia, is building using the Cutts Method.

"A gentleman came in and wanted to know if we could design a boat for him," says Ed. "He turned out to be a heart surgeon who wanted to build this boat himself. When he visited the shipyard, he brought a sketch of a skipjack with a note that read, 'An example of a classic boat that I don't like, pretty sail plan, but the hull lacks grace. Sheer too straight... bowsprit should have graceful curve, but doesn't'. So I designed the boat with that in mind."

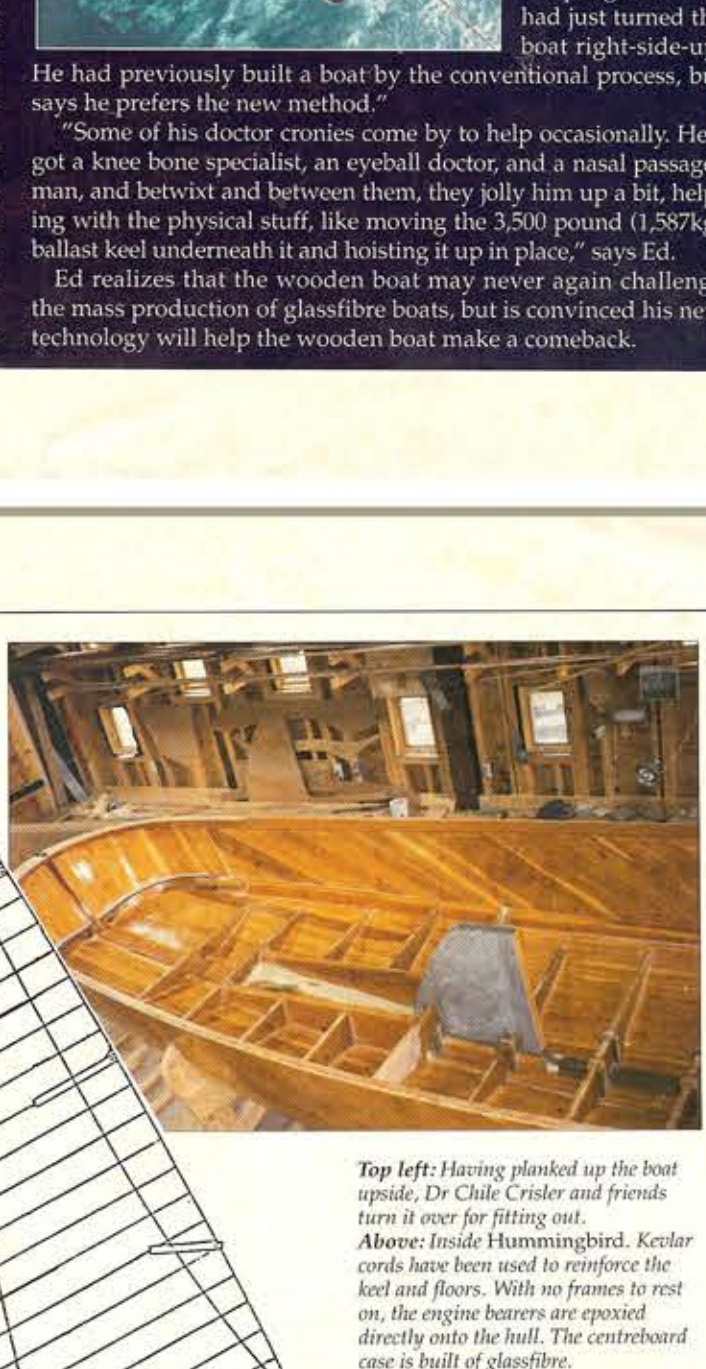
The boat he designed is a yacht with a diesel engine, hollow spars, and lightweight construction that allows a 60 per cent ballast-weight ratio. When Ed suggested the builder construct the boat by the Cutts Method and showed him the advantages, the doctor immediately agreed. "We had another boat being built elsewhere that I could show him. It was a power boat, but the same size as the sailboat he wanted. He ordered the design and began building *Hummingbird*."

ERIC POGGENPOHL

Ed visited the boatbuilder to note his progress. "He had just turned the boat right-side-up. He had previously built a boat by the conventional process, but says he prefers the new method."

"Some of his doctor cronies come by to help occasionally. He's got a knee bone specialist, an eyeball doctor, and a nasal passages man, and betwixt and between them, they jolly him up a bit, helping with the physical stuff, like moving the 3,500 pound (1,587kg) ballast keel underneath it and hoisting it up in place," says Ed.

Ed realizes that the wooden boat may never again challenge the mass production of glassfibre boats, but is convinced his new technology will help the wooden boat make a comeback.

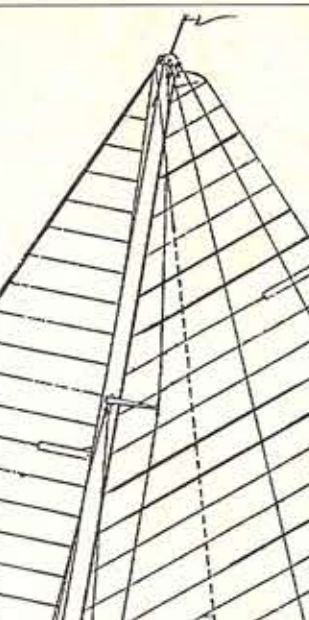


ALL PHOTOGRAPHS BY DR CRILE CRISLER

Top left: *Having planked up the boat upside, Dr Chile Crisler and friends turn it over for fitting out.*
Above: *Inside* Hummingbird. *Kevlar cords have been used to reinforce the keel and floors. With no frames to rest on, the engine bearers are epoxied directly onto the hull. The centreboard case is built of glassfibre.*
Left: *A profile view of* Hummingbird, *showing her skipjack roots. With the centreboard raised, her hull draws just 26in (660mm).*
Below: *Dr Crile Crisler fitting Kevlar strentheners over a solid timber floor.*

wire, will destruct still leaving the resin bonded join intact. The tremendous gripping power of the epoxy means a line of Kevlar can formed from several sections of the material rather than having to use a continuous strip, running from sheer to sheer, for each 'frame'.

In small boats, such as the launch and a Chesapeake hybrid skipjack built by the yard using the Cutts Method, each cord has a tensile strength of about 6,000lb (2,718kg) per cord per side. With cords spaced at approximately 3in (75mm), a skin with tensile strength of over 1,000,000lb (453,000kg) per side may be expected. This, with the stiffness of a solid timber skin of over 3/4in (19mm) thick, produces a hull skin weight of less than 1lb 8oz per square foot (3.3kg/0.1m²).



A test machine at Ed's yard holds over 2,000lb (906kg) of tension on a small cord that is imbedded in 2in (50mm) of soft cedar. It has been in tension for over eight years being observed for creep, which would allow the tensions to lessen. But upon plucking it, like a harp string, it still emits the same middle C note that it did eight years before!

For the past 15 years or more, Ed has been perfecting his building technique in his small shipyard in Maryland. His first use of his innovation was for some of the structure of the 43ft (13.11m) sloop *Jeannie*, which was ordered by Thomas Wellman, an Ohio attorney. The boat was launched in the spring of 1981. Moulton Farhnam, a former editor of a popular boating magazine wrote, "...she is a work of art, a jewel among boats. Wherever your eye rests it is delighted. Typical of the care lavished in fabricating *Jeannie's* 12 tons is her horizontal steering wheel. It is from a piece of rare Peruvian wood that was growing before the birth of Christ... built by Ed himself as a gift for the boat."

The Cutts Method was also employed in building a 14ft (4.27m) rowing boat. This experimental craft, owned by a New York Yacht Club member, remains as tight as the day she was built over 13 years ago by Ed's son, Ed Cutts Jr. Remarkably, the hull suffered absolutely no ill effects even after having been left in the water for a year, accumulating inches of barnacles on its otherwise smooth bottom.

"When we design hull structures, we do so with much experience that has been gained in the building of scores of vessels, and over a thousand opportunities to have scrutinised the problems of boats brought here from near and far for rejuvenation," Ed says. "By now we know ahead of time what causes the problems and we avoid those things." As well as sending customers detailed plans of his designs, Ed sometimes supplies full-sized plywood moulds to ensure the final boat is fair.

When the yard completes the 65ft (19.81m) commuter boat now under construction at Cutts & Case, it will be an impressive demonstration of the Cutts building method. If Ed has his way, we may be witnessing the dawn of a new era of boatbuiding.

USEFUL ADDRESS

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