

Course: Recreation 394
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PERSONAL PROJECT
CANOE BUILDING - A CRAFTSMAN'S METHOD.

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When I bought my first canoe, I carefully studied the various types (wood and canvas, fiberglass and aluminum) and in my search I happened across a manufacturer of canoes - Bill Greenwood of Greenwood Canoe Co. Bill Greenwood is a most remarkable fellow, a man in his late fifties or early sixties, who has built canoes in the Vancouver area since the mid 1930's.

When he was 24 years of age he went on a ski weekend with some of his friends up Seymour Mountain. In those days one had to hike up to the runs available on Seymour and up top there were no lifts. When a skier made a run he had to make further hikes in order to continue skiing. Bill and his pals had built a cabin up the mountain previously so they had a place to stay on weekend nights. After a day's skiing, Bill and his companions retired to their cabin. That evening Bill suffered a stroke which resulted in paralyzing the left half of his body. It was especially tragic to Bill because he had been, up to this point in his life, an extremely active individual and was well adept at such sports as mountaineering, skiing, and canoeing just to name a few.

After recovering from the worst effects of his stroke, Greenwood was at a loss as to what to do for a life's occupation and with his handicap there were few opportunities open to him. Still actively minded he made a journey by train across Canada and into the Eastern United States to the state of Maine where he made a preplanned visit to the famous Oldtown canoe factory. Oldtown granted Bill access into the factory to examine and study the means of canoe building. He studied intently the construction principles and the methods of building these quality canoes

(according to Greenwood, himself, the finest canoes ever built) until he mastered on paper and in his mind every phase of canoe building. After making tours of Oldtown, Peterborough, and other eastern canoe factories, he returned to Vancouver where he set up his own factory underneath the old Granville Street bridge. Alone with only occasional help, he began manufacturing what I regard as the finest canoes money can buy, all of which are designed from the principles of the Oldtown canoe manufacturers. However, the models are of his own design. Unlike the eastern canoe designs which are built narrower, Greenwood puts stress on building bigger canoes for safty. Many of his canoes have many similarities to the Oldtown canoes but he incorporates hard gunwales, higher freeboards and more generous tumblehomes.

These canoes are from wood and canvas construction and there are ten models, from a thirteen-foot casual model through Light-weights, Standard, Prospectors, Sportman models to his 18 foot Prospectors. At one time, he built 25 foot war canoes which he sold to various camps. Many of these canoes have been used for years and when given the proper care, they show no sign of wear or age. A case in point are the canoes he supplied to the YMCA Camp, Elphinstone, as far back as 1938.

The Greenwood Canoe Co., now situated on Mitchell Road in Richmond, has recently built a new shop. Always wanting to learn the details of canoe construction, I decided that this assignment in Recreation 394 to do a personal project in Outdoor Education, gave me an excellent opportunity to research this subject. I therefore arranged time to spend the better part of a day interviewing both Bill Greenwood and his co-worker, George Fletcher. I also took pictures of the various stages of canoe

building and observed Greenwood and Fletcher at their work.

The only materials that are commercially prepared for Greenwood in his canoe building are the canvas (in standard and heavy duty quality), the brass tacks and screws, and the paint and varnish. The wood, comprised of cedar, spruce, mahogany and occasionally white pine, is bought from a local supplier, Fife Smith & Co., in undressed blocks. From this, Greenwood cuts his planking, ribs, decking and gunwales in his own mill. He uses spruce which he cuts, shapes and steam-bends for the ribs in all his canoes. Half-ribs are also made from spruce. Gunwales are generally made from mahogany but in the last month, Greenwood has been incorporating white pine on the outer gunwales of his fifteen-foot models as fifteen feet is the longest length in which he can obtain white pine. The planks are of cedar, four inches wide, by an eighth to 3/16ths of an inch thick. All the wood is carefully examined for flaws and any questionable pieces are discarded.

There are separate molds for every model of canoe. The molds resemble canoes themselves with iron bands around the exterior of the mold where the ribs are placed. On this mold are placed inside gunwales and partial inside keel structures fore and aft. The ribs are all different and each rib is shaped for a particular or specific iron band on the canoe mold. They are steamed and placed upon the iron bands and the ends of each rib are tacked to the inside gunwales and partial keel structures. The purpose of the iron bands upon the mold is that when the cedar planking is applied to the fitted ribs, the tips of the brass tacks protruding through planking and ribs are reversed back into the ribs making the ribs and planking permanently fast.

Prior to applying planking, half-ribs are added if desired.

Like many of the materials such as ribs, seats, gunwales, deck wedges, thwarts and planking, the partial inside keel structures are prepared before the assembly of the canoe begins. These structures are notched so that the fore and aft ribs (which are cut in half) will fit into these notches. Then the partial keels are steamed and bent to the desired curve.

The canoe is only planked approximately half-way around its tumblehome. This is done in order that the canoe may be left flexible enough to be removed from its mold. Once removed, the remainder of the planking is fitted. All planks have staggered ends. This is to assure that no two plank's ends fall side by side upon the same rib. This gives more strength and rigidity to the overall construction.

The next step is the stretching of the canvas over the new canoe body. This is probably one of the most difficult procedures in the building of the canoe. Special stretching devices are utilized to hold and keep the canvas taut until firmly fastened to the canoe body. It is extremely important to make sure the canvas is free from bumps, wrinkles or looseness. Once fastened securely, the canvas is given several coats of a specially prepared oil-base silica filler. The purpose of this filler is to prevent any rot or leakages. After a few days of a sort of "seasoning" process, an undercoat or smoothening coat is applied to the canvas. This is also given a further period of seasoning.

The next step is the application of decking, gunwales, thwarts and seats. If desired the keels are also applied. Keels are generally made of oak or other hardwoods. There are two

types of keels available, the standard $3/4$ " by 1" or $1\frac{1}{4}$ ", or a flat $3/8$ " by 2" keel. The standard keel is usually preferred for stability in lakes, etc., whereas the flat keel is best for rivers and other moving waters. If fast waters are what the canoe is required for, it is best that no keel at all be applied. For example, a one inch standard keel has a surface area of better than one square foot. If caught in a strong cross current this keel will surely capsize the canoe. A flat keel has less tendency to flip and no keel, therefore, would put up no resistance at all.

Around the fore and aft edges of the canoe (directing into the keel), copper "bang-plates" or "runners" are applied. Prior to installing the keel and bang-plates, a generous application of water-proof enamel is applied to the keel and bang-plate areas to insure that there will be no leakage. The keels, gunwales, and decking are all fastened to the canoe body by $3/4$ to $1\frac{1}{4}$ inch brass screws. The keel is thus secured to the outer body of the canoe by drilling from the inside through to the keel and thereby passing the screws from the inside of the canoe to the keel. Screws are placed only on the center of the main ribs. All screws are counter-sunk. The outer gunwales are placed on the canoe by clamps. Holes are drilled through these gunwales at every second rib and then they are screwed from the outer gunwale, through the rib and into the inside gunwale. Plastic wood or doweling covers the screw's end, giving a finished look to the outer gunwales. The extending ribs are then cut flush with the inner and outer gunwale rails. The seats and the thwarts are then bolted into place.

The final steps of construction are the finishing touches

of planing, sanding, branding the Greenwood name into the fore-deck, applying three coats of spar-varnish to all bare-wood parts and two coats of marine enamel to the canvas area.

The most popular of Greenwood's models is the 16 foot Prospector which boasts 14-inch freeboard, a 38-inch beam at the tumblehome, a 34-inch beam at the gunwales and a relatively flat bottom. This canoe, although not as fast as many of the others, is extremely stable. It has a load capacity of better than a thousand pounds - this I know from personal experience. This Prospector model is also offered in an 18 footer.

Another model, which is gaining in popularity, is the 17 foot Sportsman. It is accented with a rather radical upsweep of the bow and stern. It is narrower than the Prospector, thereby eliminating a certain amount of stability but has the advantage of being a very fast canoe. It weighs approximately the same as a Prospector which is between 85 and 100 pounds.

Other models to chose from are: the 16 and 18 foot Vee-stern canoes, the Standard models in 15 and 16 feet (closely resembling the Prospectors but lacking the width and freeboard), and the Light-weight models (15 foot only) - a remarkable sturdy canoe for a craft weighing only 50 pounds. Less popular models are the 13 and 14 footers. These are less stable and have little carrying capacity. In fact, their only recommendation is manoeuvrability.

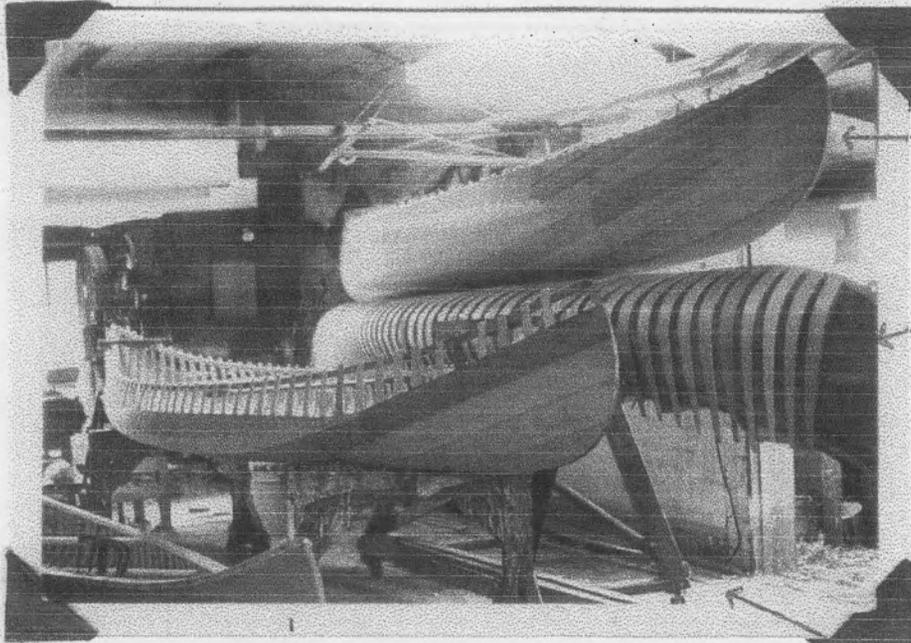
In a world that is becoming increasingly automated, searching for quick, easy methods of production, it is most refreshing to observe true craftsmen who place quality before quantity and create a true work of art.

BIBLIOGRAPHY

Bill Greenwood, private interview held March 9, 1972, Greenwood
Canoe Co.

George Fletcher, private interview held March 9, 1972,
Greenwood Canoe Co.

Mike Stewart, photographs taken March 9, 1972, at the Greenwood
Canoe Co.

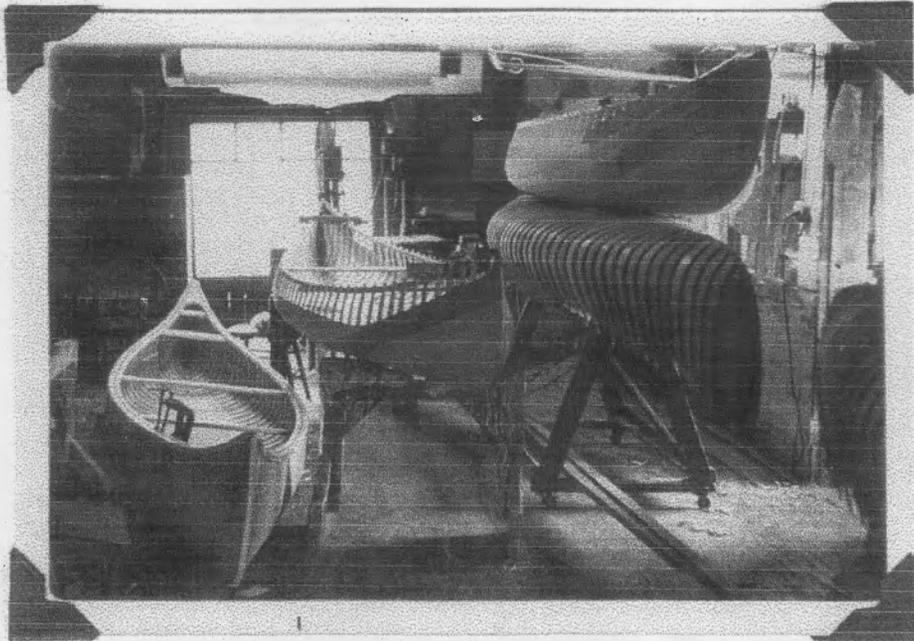


Three of the stages of canoe building. This Prospector canoe completely planked is ready for canvas.

The mold after ribs have been steamed, bent, and fastened to the gunwales and inside keel structure. These ribs are in a drying period before planking.

The canoe body is half-planked - it has just been removed from a mold. The next step is the completion of the planking and then the canvas.

This picture was taken inside the old shop - to the rear of the new building. Most of the canoe is built here. In the new building the keels, seats and all other finishing is done.

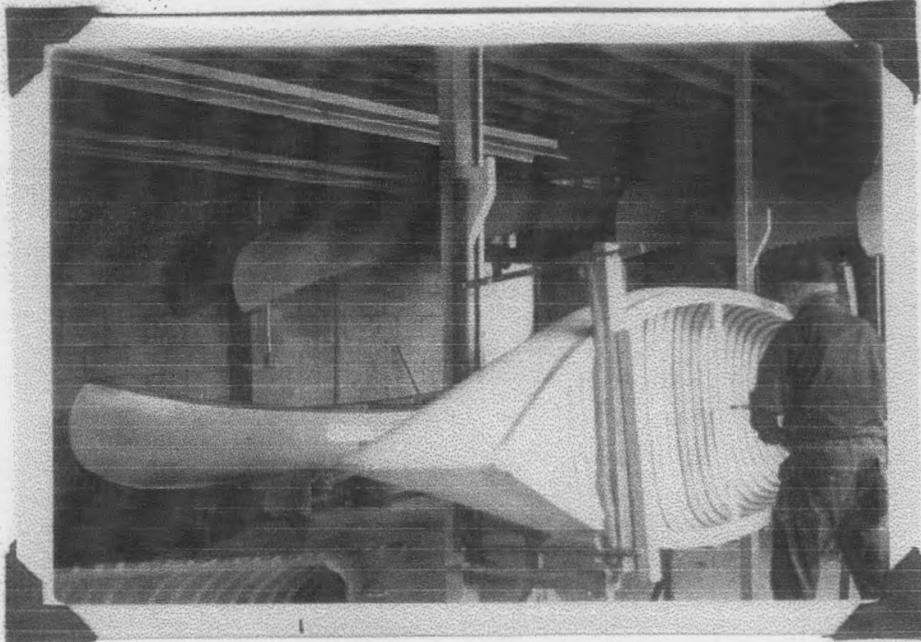


A different view of the first 3 stages. Note the roll of canvas used for canoe covering overhead. The blue canoe to the left is a 17' Sportsman. Note the narrow bow and stern. This canoe is yet unfinished. The blue color is the undercoating.



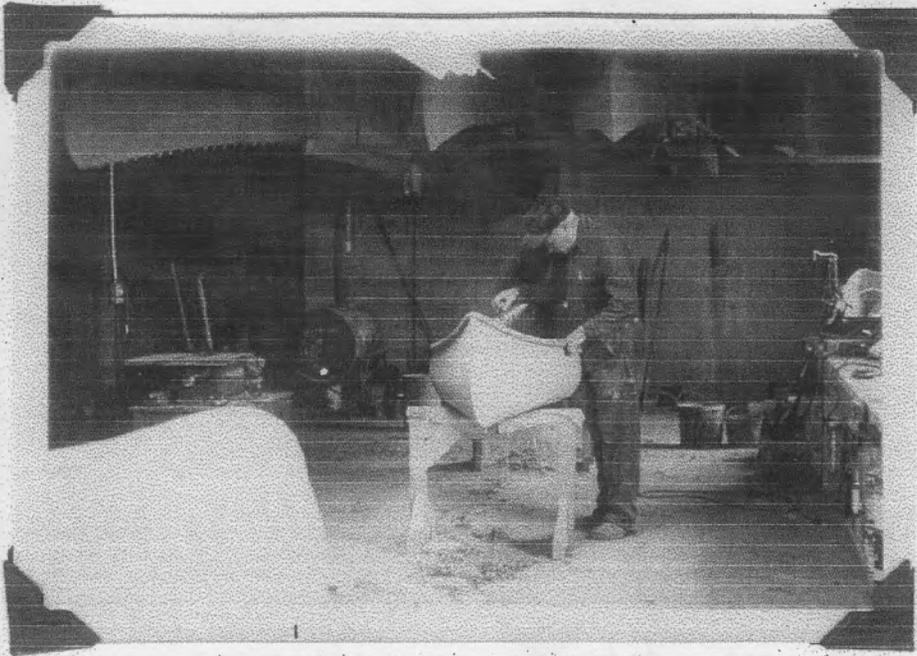
George Fletcher, left, and helper applying steamed ribs to the mold. Note iron bands on the mold, also the brace botted to hold the ribs in place. Examining closely, one can see the notched inside keel and the inner gunwales.

The ribbing is done in the center portion first, braced, and then the bow and keel are done - moving from the end in toward the center ribs.

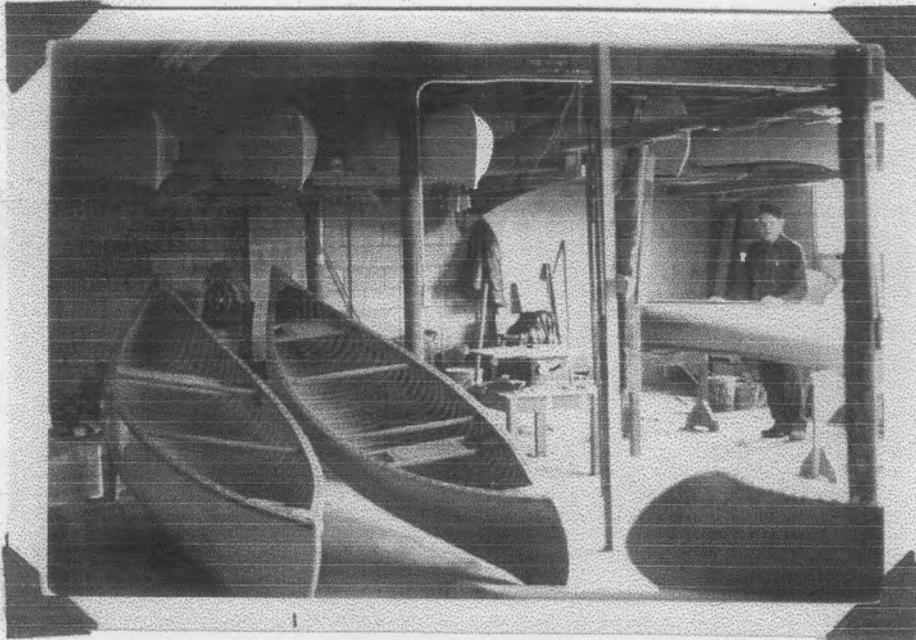


Bill Greenwood drilling holes for screws for the keel. The yellow canoe to the left is a finished Prospector. In the bottom left-hand corner is a partial view of an unfinished Lightweight.

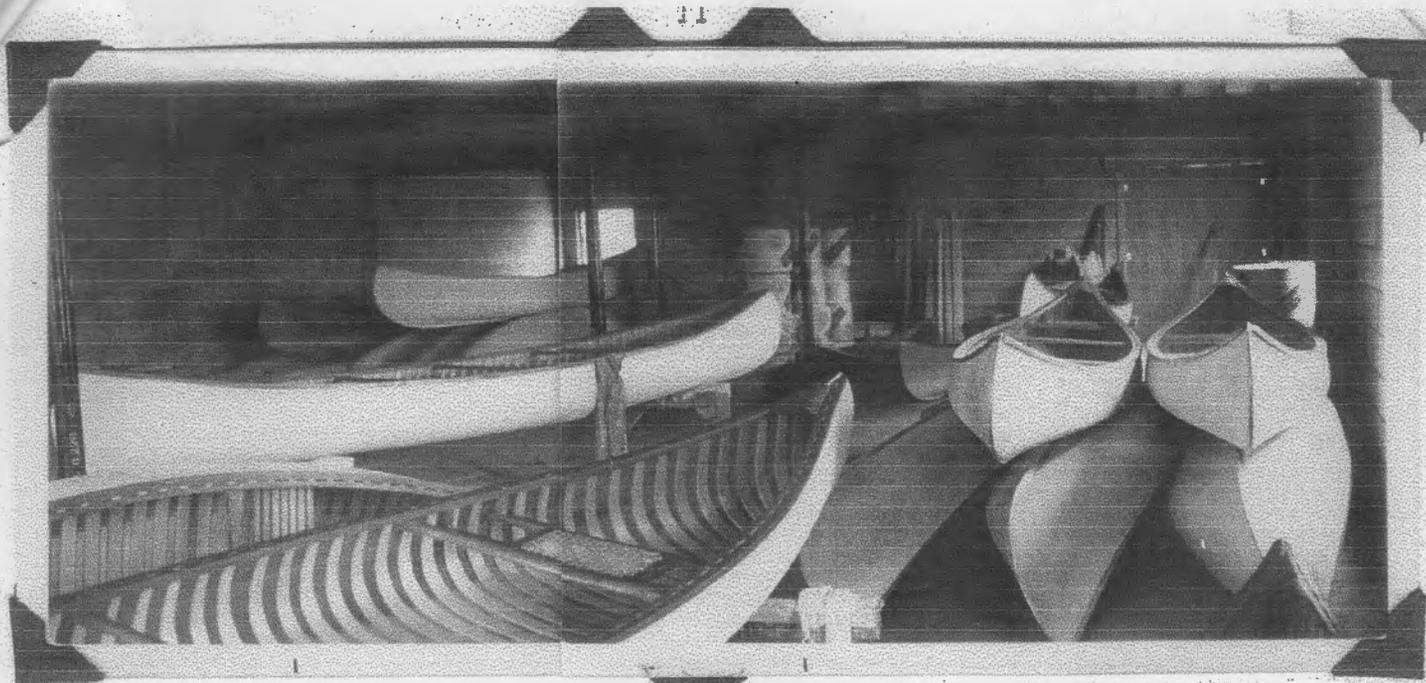
This picture was taken in the new building which provides much more space to work in than the old.



Bill Greenwood screwing down a keel. Note the unfinished canvas canoes above. These are in a seasoning or drying period after which keels, gunwales, seats, decks, etc. will be assembled to them.



Two beautifully finished canoes. The yellow one is a 16' Prospector, the red one is a 16' Standard. Note again the unfinished models above. The warmth for drying these crafts is provided from a single stove seen in the above picture.



The storeroom above the new shop. These canoes only need painting to be completed. The canoe with the rag hanging from the gunwale is a 18' Prospector. The rest of the canoes are Standards or 16' Prospectors. At the rear, barely seen, is a Sportsman (upright). Note the halfribs in the canoe in the left corner (on its side). These halfribs provide much extra strength to a craft's construction and therefore are an important option to consider.

