CANOE DESIGNS CLARIFIED

BY

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Many times in the past few years I have been asked to clarify various designs, purposes and functions of each design of canoe, as well as the merits of the different constructions. These questions have been asked by marine dealers who possess some knowledge of canoes, also by expert canoeists, as well as the beginner.

It is due to these requests that I outline herewith and as briefly as possible, the merits of various constructions, and the advantages of the different designs of canoes.

It must be emphasized that this article covers only "Stock Model Canoes" and the Three Main Types of construction presently being marketed. It does not deal with numerous types and construction of class racing canoes, or canoes constructed by the individual out of materials that he may choose to use.

CONSTRUCTION

The three main canoe constructions in use in Canada, in stock model canoes in order of popularity are:- The WOOD CANVAS construction; FIBREGLASS construction; and ALUMINUM construction.

WOOD CANVAS CONSTRUCTION

This construction is produced by using steamed white cedar ribs bent over a mould and held in place. To these ribs are fastened white cedar planking by use of brass fastenings. This, then forms the shell of the canoe. Over the shell is stretched a skin, the most common being cotton duck, of different weights

and thickness, depending on the size and weight and strength required in the canoe, The same weight situation exists with the width and thickness of the ribs and planking. So it is possible to purchase a light weight canoe of 15 ft. weighting 55 lbs. or the same size canoe weighing 80 lbs. depending on the materials used.

Some canoes with the wooden shell are covered with other materials, such as vinyl, reinforced plastic, etc. However, since the canvas outer skin is the most acceptable and considered to be superior to other covering we will pursue this construction only.

After the canvas skin is stretched over the cedar shell it is then treated with a special compound formula, to make the canvas water tight, and at the same time giving it an iron hard surface. The outer unit is then cured for several days with heat. This hard shell around the canoe allows it to slide over rocks and obstructions without hanging up. While this construction is the most durable canoe construction it should be noted that in the event of damage, it can easily be repaired even in wilderness locations, with no special equipment involved. This construction offers the most variety in canoe sizes and design, ranging from a one man 11 ft. paddling canoe weighing 35 lbs. to a large 22 ft. freight or cargo canoe weighing 310 lbs. with a carrying capacity of 2½ tons, to a 25 ft. paddling canoe used in Boys' and Girls' camps.

FIBRE GLASS CANOES

At present there are two prominent methods of construction of fibreglass canoes.

A. The Hand Lay Up Method, this method is recommended as the most suitable and according to research reports gives the otimum strength.

The construction is carried out by laying glass matt (taken from rolls) into place in the canoe mould, then saturating the matt with resin by rolling the resin into the matt and at the same time purging any air bubbles from the layup. This is repeated for each layer of matt-roving or glass cloth, until the desired number of layers are laminated into the lay up.

The great advantage of using the hand lay up method with sheet materials, is the uniformity of the thickness, throughout the length and width of the canoe assuring equal strength throughout.

B. The method known as the Chopped Glass Process is the method in which the glass is cut up in short strands and blown into the mould with the resin, mixing in with the glass as it is deposited. Again a hand rolling method is used to purge the air that is trapped in the deposit.

Fibreglass canoes are generally confined to pleasure type canoes of up to 16 ft. in length and semi freighter canoes of up to 18 feet in length. Weight varies considerably, depending on the laminates used and amount of resin.

ALUMINUM CONSTRUCTION

Canoes in aluminum construction are produced under two types of construction.

A. Cut formed construction. This method consists of cutting the aluminum sheets to pattern and fitting each cut piece over a jig or open type mould, each part or strip slightly over laps on the edge of the next strip and seam compound is placed between the laps.

The unit is rivetted along the seam. Sometimes in place of rivetting the seams, the seams are welded. The interior of the canoe is strengthened with cross ribs welded or rivetted into place. This method does not loan itself to accurate design shapes, and at times the sheer line or bottom line will possess irregular configuration, causing water drag when in use.

B. Stretched formed construction. This method of construction is carried out by placing the aluminum sheets in multiple clamp like jaws to hold it rigidly in position. A solid half mould design mounted on a hydraulic ram is forced into the flat sheet stretching it to the exact shape of the mould. The two halves of the canoe are then welded together into one piece. The unit is heat treated or annealed to eliminate stress and toughen the skin.

The advantage to this method of construction is the exact uniformity of shape, and less joints, which in time may cause leaks. Stretched formed canoes are generally slightly more costly to purchase.

Most aluminum canoes produced are pleasure canoes and prospector canoes of medium size. The average aluminum canoe of good quality and strength will weigh more than the counter parts in wood canvas construction or fibre glass construction. Although, there are some aluminum canoes that weigh less, the aluminum skin is quite thin and rather fragile.

Before leaving the construction of canoes, it is well to mention that both fibre glass and aluminum require the installation of floatation. Floatation materials are generally installed in the ends of the canoes. The wood canvas construction has natural bouyancy throughout and with its even distribution of floatation is

much simpler to handle when capsized. While the canoes with end floatation are considerably more difficult to right in deep water and re-enter, as they react somewhat like a bottle spinning on the surface.

DESIGNS OF CANOES AND THEIR USES

Most present day canoes of all construction referred to are direct copies, or modified copies, of the canvas wood construction Since this is the oldest construction sold in volume on the present day world market.

The CHESTNUT Canoe Company Limited possess the widest range of designs and sizes, of any manufacturer, and produced the first canvas covered canoes built in Canada, in the year 1897, so it is necessary to refer to the Chestnut range of canoe designs in order to cover the entire range of present day "Stock Model Canoes" the origination and the purpose of each design.

PLEASURE CANOES

The standard pleasure canoe is no doubt the originator of all canoe designs in present day use. A standard pleasure canoe at the outset was 16 ft. in length, with a beam of 32" and depth at midship of 12". The canoe was designed with a rocker type of bottom from bow to stern to permit easy paddling and simple turning Being 16 ft. in length, this unit for pleasure was considered the best design for two-man use, and its modified end depths made it a general purpose canoe for lake and river travel.

Over the years, this design has been modified in beam, to give it slightly greater carrying capacity, and more stability for use by average paddlers and for Boys' and Girls' camp use.

Additional models of the pleasure canoe have been introduced over the years, to suit the individual requirements. The purpose was intended to meet weight requirements of a minimum nature, and carrying capacity. Today the three most prominent models in the pleasure class have specifications as follows:

Length:	16'	Beam:	36"	Depth:	12"
	15'		34"		12"
	14'		32"		12"

Recommended carrying capacity are 700 - 600 and 500 lbs. respectively, while the popular Net Weights are 70 - 65 and 60 lbs. respectively.

This group provides a good range of selection and are considered suitable for double paddling. The weights and specifications above are actual specifications on the "Chestnut" canvas covered canoes. Fibre glass canoes are available in the same sizes of dimension but Net weights vary. Aluminum canoes are available in 14' - 16' and 17' sizes with varying weights and dimensions and carrying capacity.

LIGHT WEIGHT PLEASURE MODELS

These canoes are a modified take off of the regular pleasure canoes, only built extra light for the purpose of outripping and portaging. Two models are available from "Chestnut". The Bob's Special, 15' long, Beam 37", Depth 12", Net Weight 55 lbs., carrying capacity 700 lbs. The Featherweight model is a one man canoe 11' in length, Beam 34", Depth 12", carrying capacity 350 lbs. There are no doubt other makes on the market but, these are two most prominent models. Both models are equipped with tapered keels to help eliminate side drift for lake travel.

CRUISER AND GUIDE SPECIAL CANOES

The specialized use of these canoes is to navigate white water. This group of canoes was built with a sharper bow and stern and slightly more rounded bottom than the pleasure models, making them extremely alert to the stroke of the paddle. Carrying capacity has been reduced in order to gain the alertness described above.

The design is of a nature that allows these canoes to be paddled with less water drag than most other designs. Consequently, many stock model canoe racers use this design for racing. But, the original purpose of the design was for the navigation of white water.

In this respect the ends of the canoes are slightly higher than the pleasure models, so they will nose into heavy rapids, without the danger of taking in heavy water loads over the ends.

Due to the need of quick turns to avoid obstacles, these canoes are produced without keels, although keels can be installed. This type of canoe is supplied to my knowledge only in canvas covered construction.

The Guide Special canoes are exactly the same as the Cruiser models in specification with exception that the Guide Special models are ribbed closer, making the wooden shell stronger.

A. 16' Long, Beam 34", Depth 12", Net Weight 70 lbs. Carrying capacity 600 lbs.

B. 17' Long, Beam 35", Depth 12", Net Weight 75 lbs. Carrying capacity 650 lbs.

C. 18' Long, Beam 37", Depth 12", Net Weight 80 lbs. Carrying capacity 700 lbs.

The Guide Special models are identically the same but with the close ribbing. The weights are 75 lbs. - 80 lbs. - 90 lbs. respectively.

PROSPECTOR CANOES

As the name implies, this group of canoes were designed to meet the specific requirements of the prospector, whether travelling alone or in teams. All are produced to withstand the punishment and hardships of wilderness travel.

The only means of transportation was by water and since portages were a necessary part of travel to go from lake to lake, a lightweight craft was required that could be carried. Not only weight was a factor, but carrying capacity had to be increased in order to carry sufficient essential supplies to last extended periods. The size, the carrying capacity and net weight of the canoes had to be suitable to meet a varying situation and to meet a specific requirement with the minimum ease of mobility.

Consequently, the Prospector range of canoes were developed. These canoes were designed with greater carrying capacity per size, by increasing the fullness at the bow and stern, by flattening the transverse shape and in order to maintain sufficient free board by increasing the depth.

It was also recognized that these units would be used in lakes, and white water travel, so the ends of canoes were deepened from that of the standard pleasure canoes.

Paddling ability of the canoe was slightly reduced in the interest of greater carrying capacity and stability.

The Prospector canoes range in length from 14' to 18' and in depth from 13" to 15" depending on the load conditions.

With the advent of the outboard motor, a demand was developed for these canoes for use with small outboard motors, therefore, each size is available in Vee Stern design to meet this need as well as in the regular Pointed Stern models.

Prospector canoes are available in Aluminum construction with "U" shape stern as well as in wood and canvas construction. The latter being the most in demand, and offering the widest range of selection. Wilderness travel and its dangers has no doubt had effects in maintaining the demand for the canvas covered canoe due to the strength and ease of repair in the field.

Sizes available in canvas covered construction:

Length	Beam	Depth	Net Weight	Carrying Capacity	Stern Design
14'	34"	13"	60 lbs.	600 lbs.	Ptd.
14'	34"	13"	70 lbs.	600 lbs.	Vee
15'	35"	13½"	70 lbs.	650 lbs.	Ptd.
15'	35"	13½"	80 lbs.	650 lbs.	Vee
16'	36"	14"	75 lbs.	850 lbs.	Ptd.
16'	36"	14"	85 lbs.	850 lbs.	Vee
17'	37"	14½"	85 lbs.	950 lbs.	Ptd.
17'	37"	14½"	85 lbs.	950 lbs.	Vee
18'	38"	15"	90 lbs.	1100 lbs.	Ptd.
18'	38"	15"	100 lbs.	1100 lbs.	Vee

It should be noted that aluminum and possibly some fibre glass canoes are offered in Prospector style, but, those listed are the most common in use.

FREIGHTER CANOES

Many pages could be written about the purpose and uses of the Freighter canoe, sometimes called a cargo canoe. Many varieties of these canoes are on the market, some called Semi Freighter canoes which are generally much smaller in size, actually close to the size of the Prospector models.

The original freight canoe as used today was developed by the Chestnut Canoe Company, Limited in the late 19th century and early 20th century. While they have been modified several times in size and design, to meet the year to year demand and use, the basis and construction technique of these canoes are basically the same as the original Freighters produced back in 1898.

At that time there was need for a canoe to move families, and goods from place to place in the Canadian Artic region. These units again required light weight but excessive carrying capacity, as well as tremendous stability for travel in large open waters, and indeed in offshore travel in the Artic.

One requirement comes to mind, and possibly the requirement that enhanced the expanded line of these canoes was the "Gold Rush" at the turn of the century where supplies for a year, plus numerous passenagers had to be carried.

Today the freight canoes are used for the same use of transporting people and supplies along with many more demands. They are also used in the Arctic for white whale fishing, hunting and regular net fishing and exploration.

They are ruggedly constructed, light in weight for their size, and considered to be as seaworthy as any water craft of equal size and weight.

The Freighter canoes are made from wood canvas construction and are extensively used. I know of no other construction offered in a full Freight canoe design.

The Freighter canoes, which originally were built for paddling with double pointed end design, have become almost extinct, and in their place is supplied the Vee type stern used mostly for river travel, and the flat wide stern used mostly for open water travel.

The Vee stern model permits the travel up stream with the use of a motor, and can be paddled down stream stern first as the under water shape is the same as a pointed end canoe.

FREIGHT CANOE SIZES

Length	Beam	Depth	Net Weight	Carrying Capacity	Stern Design
17'	45"	17"	125 lbs.	1600 lbs.	Vee
17'	45"	17"	125 lbs.	1600 lbs.	Flat Wide
18'	46"	18"	135 lbs.	1800 lbs.	Vee
18'	46"	18"	135 lbs.	1800 lbs.	Flat Wide
19'	51"	19"	165 lbs.	2000 lbs.	Vee
19'	51"	19"	165 lbs.	2000 lbs.	Flat Wide
20'	52"	20"	195 lbs.	3000 lbs.	Vee
20'	52"	20"	195 lbs.	3000 lbs.	Flat Wide
22'	62"	24"	310 lbs.	5000 lbs.	Vee
22'	62"	24"	310 lbs.	5000 lbs.	Flat Wide

SALMON FISHING CANOES

To my knowledge The Chestnut Canoe Company, Limited is the only company producing canoes for this specialized use. Again they are produced in a variety of sizes to suit the individual need and the varying types of water in which they are used.

These canoes are white water canoes and are ruggedly constructed, as it is common for them to come into contact with shoals, rocks, and other obstacles. So, they have to be rugged, seaworthy and tough.

The major design change in the salmon fishing canoe, which incidently is known as the Chestnut Ogilvy series are as follows:

1. Straight line bottom from stem to stern.
2. Flat cross section, making them most stable or steady canoe for its width on the present day market.
3. A reasonably high bow and stern ends for white water travel.
4. Close ribbing for strength and durability.
5. Measurements in length from 16' to 26' graduated in 2 feet measurements.

One may ask the question "Why all these features?" and they may well be answered in the following manner:

A. Straight line bottom - less draft.

B. Flat cross section stability to allow the fisherman to stand up in the canoe while fly casting or poling.

C. Various lengths - these canoes are required to navigate at times in water with only a few inches depth. In cases of this nature, it is then necessary to use a longer canoe that has less draft with same load capacity.

Most of these canoes are considered a two man canoe for the purpose of Salmon Fishing, even though the particular model may be 26' long, and capable of carrying many more people and greater loads.

Again, these canoes are produced in canvas wood construction so they will not become hung up on rocks or other objects.

Many canoeists today use the Ogilvy canoes on account of its stability for fishing and hunting and even transportation in some wilderness travel. They are manufactured for paddling or in Vee stern for small motors.

OGILVY SALMON CANOE SIZES

Length	Beam	Depth	Net Weight	Carrying Capacity	Stern Design
16'	36"	13"	80 lbs.	850 lbs.	Ptd.
16'	36"	13"	85 lbs.	850 lbs.	Vee
18'	36"	13"	85 lbs.	1000 lbs.	Ptd.
18'	36"	13"	90 lbs.	1000 lbs.	Vee
20'	37"	13"	105 lbs.	1300 lbs.	Ptd.
20'	37"	13"	110 lbs.	1300 lbs.	Vee
22'	39"	14"	130 lbs.	1500 lbs.	Ptd.
22'	39"	14"	135 lbs.	1500 lbs.	Vee
24'	40"	14"	150 lbs.	1800 lbs.	Ptd.
24'	40"	14"	155 lbs.	1800 lbs.	Vee
26'	40"	14"	160 lbs.	2000 lbs.	Ptd.
26'	40"	14"	165 lbs.	2000 lbs.	Vee

MAINTENANCE

Much can be said in regards to various constructions, and the maintenance of each. It can be said that no canoe or water-craft of any construction is maintenance free. This may destroy the popular opinion of some, who believe that certain types of construction are less maintenance free than others.

This may be so to certain degrees, but unless your canoe is kept in ship shape at all times, its life expectancy will be greatly decreased, and much will be lost in the way of use.

The canvas canoe should be refinished only if absolutely necessary. Touch up of scratches on the outer surface is desirable more for appearance than for any other purpose.

The aluminum canoe becomes dented it should be pounded out for appearance sake and the elimination of as much water drag as possible.

The fibre glass canoe will scratch more easily than other constructions and will leave white marks which are more prominent than the same type of marks on canvas or aluminum.

REPAIRABILITY

Should damage occur, the canvas covered canoe is the most easily repaired, even in remote areas without special equipment.

Fibre glass canoes can be repaired, if a proper repair kit is available to do the job.

The aluminum canoe is most difficult to repair, even if a proper kit is available, and in my opinion more skill is required.

LIFE EXPECTANCY

Since the canvas covered canoe construction is the oldest of the three constructions on the market it is common to find canoes in great volume 40 years old or older and I know of one canoe of this type that has been in continuous service since 1899 with one major overhaul.

Aluminum canoes seem to stand up fairly well over the long haul, but it is too early to make a worth while assessment as to the actual life expectancy. Rough water and the working of the bottom of the canoe will no doubt cause metal fatigue in time or the loosening of rivets.

Glass canoes may well stand up for a period of time, but

they are not considered as a good white water craft and much of the work loads are removed from this type of construction.

I would suggest without prejudice that 10 years would be considered the total average expectancy of Fibre Glass canoes. Much depends on the actual method of construction and material used.

GENERAL

While the foregoing has mentioned the various designs of canoes and shapes, the drawings following of the cross sections of canoes - the longitudinal shapes, the bow and fullness and the rib construction are all over emphasized in the drawings, so they can be more easily distinguished one shape from the other. These deal only with present day types of prominent canoes. As mentioned at the outset, there are numerous other canoes in shapes, designs and dimensions on the market that may fall within the category mentioned.

Some of these models are built special and not in volume as stock model canoes mentioned above.

Example of these are the Group paddling canoes, such as the Chestnut Centennial Design, a 25' model, 19' Nestable a group paddling canoe also modified Ogilvy canoe built extra deep for group paddling in various lengths. There are also trapper canoes - modified designs of other models - square stern pleasure canoes and light weight commercial canoes, But, most of them are modified from other models, with the same basic hull designs.

No doubt many questions are left unanswered and this article is written only to inform in a general way the basic common designs and the intended purpose of each.

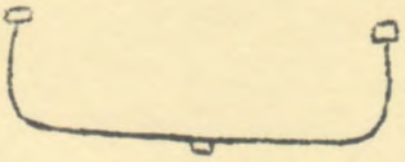
The selection of the proper canoe is of paramount importance

to the user, and if your selection is the proper one, then you will have many years of enjoyment from your canoe. If your selection is not the correct one, it may lead to the disbanding of a sport that could otherwise give you a lifetime of quiet relaxation and joy.

It is up to you to make the proper selection, or request information from qualified canoeists or a reputable producer who can fill your exact needs.

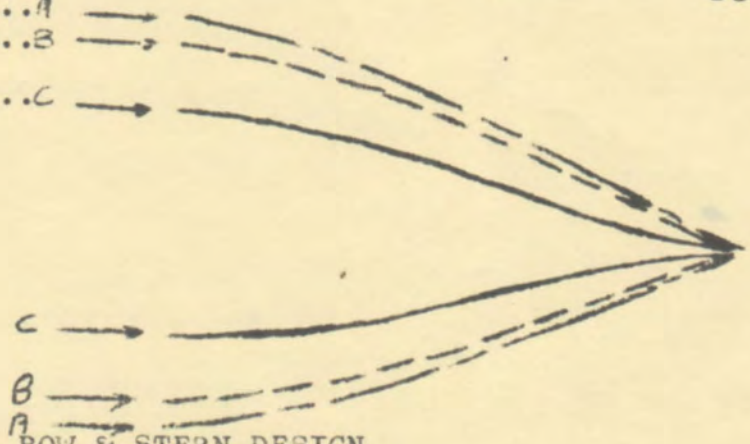
U-STERN DESIGN
Mostly in ~~aluminum~~ Canoes

V-STERN

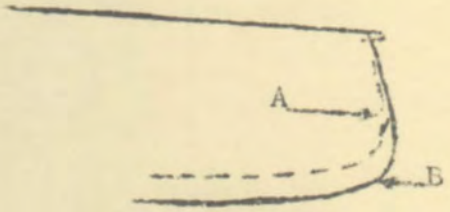


FREIGHTER Wide Stern Design

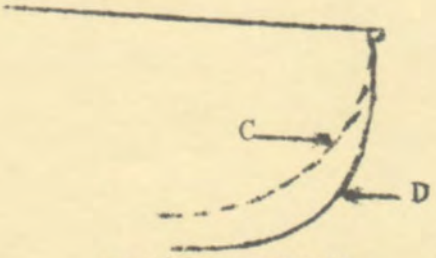
Prospector, Freight & Ogilvy...A
Pleasure.....B
Cruiser & Guide Specials.....C



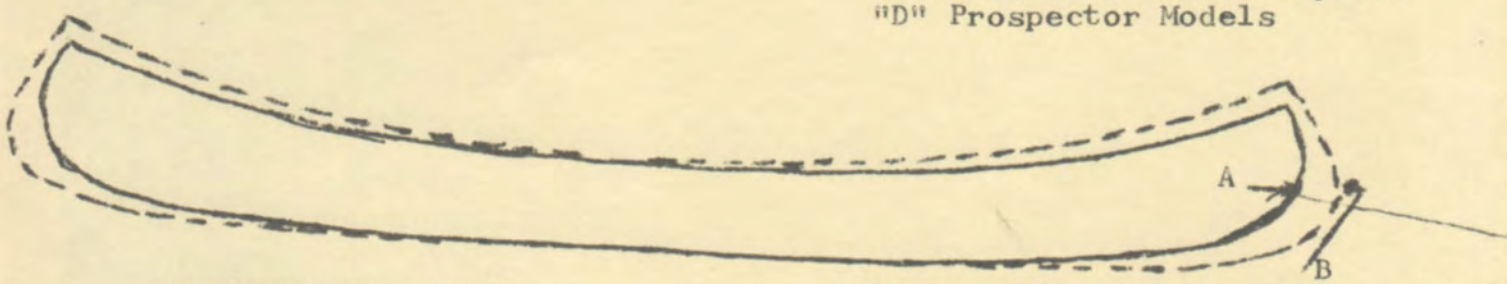
PLAN VIEW --- BOW & STERN DESIGN



CROSS SECTION
"A" Pleasure Models
"B" Ogilvy Models



CROSS SECTION
"C" Cruiser & Guides Sepcial
"D" Prospector Models



LONGITUDINAL DESIGN — SAME BOTH ENDS
"A" - Freighter, Pleasure, Prospector, Cruiser & Guide Specials
"B" - Ogilvy Models