A NARRATIVE HISTORY OF THE S.S. KLONDIKE
by Arnold E. Roos
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Abstract

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Abstract

After the sinking of the S.S. Klondike No. 1 in 1936, a decision was made by the British Yukon Navigation Company, a subsidiary of the White Pass and Yukon Route, to replace the Klondike with a riverboat of virtually identical design. Work on the second Klondike was started in Whitehorse in 1936 and completed in 1937 in which year she was also launched.

As was the case with Klondike No. I, S.S. Klondike No. II was designed primarily as a freight boat. Specifically, it was built to eliminate the need for barging sacked silver-lead concentrate from Stewart Landing to the railhead at Whitehorse, although as things turned out, the Klondike did not eliminate barging but rather took its place alongside the barges as a means of moving freight along the Yukon River. The carriage of passengers was clearly a secondary function for the Klondike, as a quick glance at her pre-1953 profile or her passenger accommodation will verify, although the company was prepared from the beginning to add more passenger accommodation should this become necessary. During the earlier period of the Klondike's
operations the passenger trade consisted largely of tourist excursions, in which two other British Yukon Navigation Company vessels, the Whitehorse and Casca, specialized, and the carriage of local residents. The Klondike was used, when necessary, to carry tourists that could not be accommodated on the Whitehorse or Casca, and because the atmosphere was more formal on the Klondike than on the tourist boats, the Klondike appears to have been preferred by the local residents.

Klondike No. II underwent very few modifications or additions in its first thirteen years of existence, with the exception of minor changes to facilitate the ship's operation. In 1950, however, the Texas deck cabin housing was extended aft to provide additional berths and the galley was completely remodelled. The decline in freight traffic occasioned by the completion of the highway from Whitehorse to Mayo (1950) and the commencement of construction of an all-weather road from Stewart Crossing to Dawson (1951) led to the conversion of the Klondike to cruise service, under joint arrangement with Canadian Pacific Airlines, in 1953. This resulted in an extension of the saloon deck housing aft and the addition of crews quarters on the freight deck. The operation of the Klondike as a cruise ship was found to be unprofitable and the vessel ceased operation in 1955.

This report will look at the operation of a sternwheel steamer on the Yukon River with special emphasis being
placed on what was required to keep the Klondike on the river.
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To all of the former crew members, employees of the White Pass and Yukon Route, some of their descendants and present and former residents of the Yukon who assisted me, there really are no words to express my thanks for the invaluable aid given. As the list is quite extensive, one will have to refer to the bibliography for a complete list of these people. Without their photographs, their recollections, their films and those items that they have in their possession that managed to survive the years, all of which they were so kind to show us, this report would have been impossible.
Introduction

In the late 1950s, the Minister of the Department of Northern Affairs and National Resources, acting on the advice of the Historic Sites and Monuments Board of Canada, declared transportation in the Yukon to be a theme of national historical significance. To commemorate this theme, the department acquired the sternwheeler S.S. Klondike No. II, along with three other vessels, in 1960. During the 1960s, it was decided to restore the S.S. Klondike as a national historic site and a project team was established in the 1970s, initially under Western Region, Parks Canada, and subsequently under Prairie Region, Parks Canada, to undertake the restoration.

The purpose in writing this outline was to provide those at the S.S. Klondike site in Whitehorse with an overview of the functioning of the sternwheeler steamer Klondike. This work was not meant to be comprehensive or definitive and merely attempts to bring some coherence to many of the recollections of former crew members. A comprehensive work on the functioning of a Yukon steamer would require far more research than allotted for this brief
monograph. It is hoped that, even in the rough format it has been presented in, it will answer some of the questions that should arise concerning the vessel and those who served on her.
Introduction to the Steamboat

The first successful application of steam to propel a vessel was achieved in France in 1783 on the river Saône near Lyons by the Marquis Claude de Jouffroy d'Abbans. Jouffroy used a double ratchet mechanism connected to two horizontal double acting cylinders to obtain rotary motion for his paddle wheels which were attached to the side of the vessel Pyroscaphe. This successful trial predated by 20 years one by Robert Fulton, the man usually thought of in connection with steam powered vessels, who in 1803 successfully demonstrated a steamboat on the river Seine. In the intervening years Robert Fourness and James Ashworth in England, John Fitch and Samuel Norey in the United States and the Charlotte Dundas built for Lord Dundas of kerse to be used on the Clyde canal in Scotland all preceded Robert Fulton in successful contributions of steam and paddle. This is not to diminish Fulton's achievements, as it can be said that he was the first to run a successful commercial operation when the Clermont commenced service on the Hudson river in New York in 1807.

The first steamer on Canadian waters was not far behind
for in October 1809 John Molson's paddlewheel vessel Accommodation commenced trial runs on the St. Lawrence river down to Boucherville Island from Montreal. Besides being the first in Canada it was apparently the first steamer completely built in North America as her engines were cast of iron at Les Forges St. Maurice with the smaller parts of her machinery being made by Messrs. Geo. Platt and Ezekiel Cutter at Montreal. The motive power of all other North American vessels had to that time been obtained from England.

John Molson may have obtained the requisite knowledge and possibly the impetus to try this venture from John and James Winans of Burlington, Vermont. The Winans brothers had successfully launched their steamer Vermont on Lake Champlain in 1808. This was a region in which Molson travelled quite often in pursuit of his brewing business.

The Accommodation began commercial service from Montreal on 1 November 1809 reaching Quebec on the fourth. The vessel had 20 passenger berths besides accommodation for a crew of six. Of the 66 hours spent on this voyage only 30 hours were actually spent sailing, which meant it had a speed with the current of approximately 4.45 miles per hour. The power was found to be insufficient and in 1810 a new and stronger boiler was installed to try to alleviate the situation. The venture was, however, not successful for by the end of the 1810 season a £4000 loss had been sustained,
which forced Molson to buy out his two partners, John Jackson and John Bruce, who could not afford such a financial loss.

This initial disappointment did not deter Molson for he proceeded to plan a more powerful vessel that would be able to cope with the current of the St. Lawrence. He apparently made a trip to New York to meet with Robert Fulton about steamboat design. Fulton seems to have offered to design him a vessel capable of 5 miles per hour. Molson does not, however, appear to have taken him up on it. As the weakest aspect of his first vessel was the engine Molson apparently decided to go to England and there obtained from Boulton, Watt and Co. a steam engine of 26 nominal horse power which he placed in a new vessel called the Swiftsure launched in the summer of 1812.

The Swiftsure became the first successful commercial steamboat venture in Canada. From the time she entered service in 1813 until her machinery was placed in another vessel of the same name in 1818 she plied the St. Lawrence, even partaking in the movement of troops during the 1812-14 war.

The success obtained with the Swiftsure not only persuaded Molson to build another vessel in 1815, the Malsham, again fitted with a Boulton, Watt engine, but also brought him competition. In 1816 Thomas Torrance launched the Car of Commerce patterned after one of Fulton's vessels
the Car of Neptune. In response to the Torrance boat Molson launched the Lady Sherbrooke in 1817. Others soon followed so that by 1819 there were seven steam packets on a regular run between Quebec City and Montreal.

The fact that steamboats could be run as a successful commercial venture was not only obvious to those who travelled the St. Lawrence but also to other businessmen elsewhere in the Canadas. In 1815 a company was founded to provide steamship service between Kingston and Prescott. The first vessel to navigate lake Ontario was the Frontenac which was launched at Ernestown (Bath) on 7 September 1816. By 1819 regular steam packet service was well established between Kingston, Toronto and Hamilton. Steamers gradually spread westward providing, before the advent of the railway, the most convenient and regular form of transportation available to the settlers.

Aspects of Riverboat Design
Steamboat hulls evolved throughout the nineteenth century and by 1900 had fairly well achieved their final forms. There is no specific design that could be termed the classic hull, for the design chosen for a particular steamer was dictated by the nature of the waterway and the purpose of the vessel. If the intent was to have the vessel work on deep lakes and rivers the hull would have had a closer affinity to the deep, keeled hulls of ocean going vessels
than to the shallow water craft of many inland rivers. If the main purpose of the steamboat was to service communities along a shallow river system the hull would have been keelless, shallow, and flat along the bottom. Even within these broad classifications there were variations of design which were dictated by whether the boat was a stern or side wheeler, whether it had to contend with rapids and so forth.

The first steamboats that appeared on rivers in the early part of the nineteenth century were not at all that distinguishable themselves from sea going vessels. The hulls were deep and well rounded, with projecting keels and a very marked sheer, fore and aft. They had a low ratio of breadth to length and of depth to length. As was the normal practice on ocean going vessels cargo, machinery and living quarters were housed in the hull. Some of these vessels were fully rigged for sail in order to take advantage of the wind. However, it was recognized fairly early on that such vessels had a very limited range on inland waterways.

Historians of the steamboat are in general agreement that the keelboat that was used in the early 1800s to move traffic upstream on the Mississippi River and its tributaries provided the prototype for the so-called western rivers steamboat. It was not until the 1850s, however, that the western steamboat had evolved to the point that the lines and proportions normally associated with it were
established, and that the influence of the associated ocean going ships was, as it were, left behind. During this period, rigging for sail was quickly eliminated as was the bowsprit, which was replaced by a vertical jackstaff that provided the pilot with a sight that was indispensible for steering the vessel. The deep keeled and ballasted hull, so necessary to provide a counterbalance to the top heavy rigging and hence to provide stability on the open, storm-tossed seas was not required and it too disappeared.

In building vessels for inland transportation the swiftness of water, obstructions to navigation, the depth of the navigation channel and lack of wharves were critical factors. The primary consideration in hull design became lightness of draft in relation to tonnage and cargo capacity. What was wanted was a hull which could support the greatest weight on the shallowest draft while giving speed and maneuverability. This meant that not only was the hull design changed but the superstructure was also affected. To reduce the depth of the hull many of the functions that were housed in the hull on ocean going vessels were moved elsewhere. Machinery was moved to the main- or freight-deck which ran from gunwale to gunwale and from the bow to the stern. Accommodation was now provided in a housework or superstructure that was built above the hull. Cargo was no longer stowed in the hold but on the freight deck. To obtain shallow draft, length and breadth
of the hull were increased, thereby obtaining a greater water plane area and increasing the ability of the hull to sustain weight at a given draft in accordance with the principle that the hull design which would give the greatest buoyancy is essentially a rectangular box which would give a maximum capacity for load. Of course, such a rectangular vessel would be extremely difficult to manoeuvre, thus a designer would try to stay as close to the ideal as possible, restricting the curved surfaces necessary for speed and manoeuvrability within short distances of the bow and stern.

This evolution of the riverboat hull was not sudden: it progressed incrementally over the first 50 to 60 years of the nineteenth century. Some of the more obvious solutions to obtaining shallower draft entailed the elimination of the keel and a simple reduction of weight of the vessel through the use of lighter methods of construction. The keel which improved the steering and handling qualities of a sailing vessel was a useless appendage on a riverboat and at times a hindrance as it prevented quick sideways movements. Furthermore, for every inch the keel extended below the hull a large quantity of freight had to be eliminated. The structural functions of the keel was replaced by light keelsons built inside the hull. This change saw the virtual elimination of the keel by about mid century. The thick planking used on earlier hulls to guard against the
possibility of being holed by snags and other obstructions was also rendered unnecessary by the progressive elimination of the worst of such dangers. Consequently boat builders started to lighten the material used in the construction of the hull and also eliminated such weighty structures as double bows. The hulls eventually ended up being little more than light weight shells.

While in principle it was not difficult to obtain shallowness of draft the solution to this problem being quite evident, the problem was how to obtain sufficient longitudinal strength and stiffness in order to prevent sagging at the ends - a phenomenon known as hogging - and sagging in the middle. The steamboat builders resorted to three basic devices to accomplish this: careful distribution of weight, longitudinal bulkheads and hogchains. Hogging is a problem with both side and stern wheelers. The problem is more pronounced with sternwheelers as most of the machinery is located at the forward and aft ends of the vessel, whereas, with a sidewheeler the engines are near the middle of the craft which counteracts this phenomenon. One way to alleviate some of the accentuated hogging found on the shorter stern wheeler was to move the boiler forward thereby moving some of the weight to the problem area. The horizontal engines of stern wheelers also helped in that their weight could be extended over a number of deck beams. Builders also employed light fore-aft bulkheads to
supplement the keelsons and thus stiffen the hull. As the vessels grew in length, however, more reliance was placed first on the hog frame, which was a fairly cumbersome arched wood frame that extended above the superstructure. In appearance it was not unlike the structural members of a bridge. This frame gave way to a much lighter fore-aft hog chain system. These were iron rods ranging from one to two and a half inches in diameter that were made fast to the hull timbers in the bow and stern and were carried over a series of struts and masts rising from the keelsons. Through a series of turnbuckles, these hog chains could be lengthened or shortened to counteract the sagging and hogging found in a light weight riverboat hull. This hog chain system, which came into being in the latter half of the century allowed fairly easy adjustment of the hull to meet load and river conditions.

One aspect of traditional hull design that disappeared slowly was sheer. The sheer, that is the marked rise in the deck fore and aft of midships, was necessary in ocean going vessels to ward off waves. As there were no real waves on inland rivers (lakes excepted) there was little need for anything but a very minimal sheer. It was not until the 1850's however, before this aspect of hull design was reduced to a level of need. As with sheer, free-board was also diminished till by mid century the main or freight deck was not very far above the water level.
For sidewheelers with independently operating wheels very little changed as far as rudder design was concerned since the traditional single wing rudder attached to the after side of the rudder post was found to be quite adequate. This was, however, not the case with sternwheelers. To obtain the same turning power on these vessels it was initially found necessary to employ up to four wing rudders. The wing rudder was eventually replaced in the latter half of the nineteenth century by the balance rudder, the blade of which extended aft under the paddle-wheel as well as forward under the rake of the hull. Such a position allowed for a rudder of much greater surface area which resulted in an increase of turning power. These rudders because of their position just forward of the wheel were found to be effective, although this effectiveness was negated to some extent by the eddy created by the wake of the vessel. Their effectiveness was greatest when the vessel was backing, as the paddle wheel drove the water directly against the rudder. Further improvements to the rudder system came with the addition of monkey rudders aft of the wheel as this got away from the eddies aft of the hull. With rudders both fore and aft of the wheel the vessel did not need steerageway to manoeuver as this could be obtained by the action of the paddlewheel alone. The number of decks that a vessel had was dictated by its purpose and, in part by its size. The smaller the vessel
the fewer the number of decks one might expect to find, although there was no clearly defined relation between the two. If its main function was that of a freighter it might only have had one deck above the freight deck; however, if passengers were a significant segment of its trade three and even four decks above that of the freight deck on the larger vessels were eventually not that unusual.

With the severe reduction in free board on the vessels, the superstructure often gave the riverboats an ungainly and top-heavy appearance. The top-heaviness was to a certain extent only visual in appearance, as the construction methods used made these superstructures much lighter than they appeared. Most bulkheads were constructed of lightweight woods such as cedar and were only of single skin thickness. The decks above the freight decks were not much thicker than the bulkheads, with watertightness being obtained from a painted canvas covering. The prime rule in the construction of the housing was lightness as any unnecessary weight meant less cargo capacity and greater draft, that is, the two things that were not wanted.

Steamboat Power Plant
The motive power of sternwheel riverboats in the Yukon was provided by steam engines. Such engines come under the general classification of heat engines, which derive their power from potential energy stored in fuels. The fuel is
burnt to produce heat energy which in turn is converted into mechanical power. Where heat energy is transmitted in a closed system between the place where the fuel is burned (a boiler fire box), and the place where heat is converted to mechanical work (a cylinder enclosing a piston), the engine is called an external combustion engine. Internal combustion engines are engines where the fuel is burned in the cylinder. The engines under discussion were of the external combustion variety.

Although coal was used on a few occasions on an experimental basis, Yukon river steamers burned wood for fuel until almost the end of the riverboat era. Wood had several advantages. Probably the foremost was that it could be obtained from timber stands located along the river and hence there were no transportation cost, involved in getting it to the fuelling stops. This is not to say that there were no procurement costs, since the wood had to be cut and stacked in convenient places. This operation was done by wood cutters on a contract basis and has been dealt with in greater detail in another section of this report. The fact that wood was readily available meant that the vessels did not have to carry a full supply of fuel for a round trip, thus leaving more space for cargo. An added bonus for the vessels was that there was very little ash left after combustion since wood consists mostly of carbon, hydrogen, and oxygen which are to a very large extent converted into
carbon dioxide and water vapour during burning. The ash that remained was of such consistency that it was easily blown out through the stack by the draught.

The potential heat energy stored in fuel is of course released through combustion. In order to obtain the maximum heat energy from the fuel, the prime concern of the fireman on a boat like the Klondike was to obtain complete combustion of his fuel supply. Incomplete combustion resulted in smoke and lowered operating efficiency. In order to obtain complete combustion, the furnace volume of the boiler had to be large enough to permit complete burning of fuel particles before they entered the heating surfaces and were cooled below their ignition temperatures. The furnace volume had to be such that it allowed a thorough mix through turbulence of oxygen with the burning fuel gases and particles. This mix of fuel and air was engendered through the control of primary air that was conveyed through the fuel bed and the velocity of secondary air, that is air that did not pass directly through the fuel.

The carrier of heat energy in the closed system used on board the riverboats was water in the form of steam, hence the name steam engines. Although not the most efficient carrier available for a closed system, fresh water has several properties which offset any deficiencies. The major point in its favour in the Yukon. Another is that when a liquid is converted into its gas at its boiling point, the
liquid does not increase in temperature as more heat is applied: all that will happen in such a case is that more gas will be produced. When water is boiled in a system, even though the water may be under pressure which would raise its boiling point, this point once reached remains fairly constant, and should be well below the temperature at which the container holding the water would be damaged. The water in this case is acting as an effective conveyor of heat away from the container. The fact that water is a liquid below 212 degrees fahrenheit at one atmosphere of pressure means that any engine using steam as a carrier cannot extract the heat energy remaining in the steam below the temperature it condenses into water. The condensation of steam into water, although a limiting factor in the conversion of heat into mechanical work in a heat engine, plays an important part in helping to reduce the back pressure or resistance to the movement of a piston in a cylinder, thereby increasing the engine's power.

Since water in the form of steam was used to transfer the heat energy from the fuel supply to the engines, a transfer of energy had to be effected from fuel to carrier and this occurred in the boiler. Requirements for these riverboats as far as boiler type was concerned were that the boiler be portable, relatively light in weight, comparatively compact per unit capacity, easily repaired and obtainable at a reasonable cost. The boiler that best met
these requirements in the Yukon was the fire tube or locomotive boiler, so called because its major use was in steam railway locomotives. There are constraints in using a locomotive boiler such as limits on pressure and capacity, the fixed shape and dimensions of the firebox and the fact some spaces in the boiler are difficult to clean. Even with its limitations the locomotive boiler has proven to perform its appointed steam producing function adequately, given the parameters of weight and size it had to meet.

Schematically the operation of a locomotive or fire tube boiler is fairly simple. A fire tube boiler is one where the gases created by combustion pass from the fire box, where the fuel is burned, through tubes surrounded by water, into the smoke box end and then up through the stack or flue. The energy transfer from the combustion gases to the water takes place along the tube section of the boiler. The heat energy so transmitted converts the water into steam which is collected in a header from which it is directed by pipes to where the energy is to be converted into mechanical power.

The transfer of energy from fuel to water, although simple in principle, requires careful attention in order to avoid dangers and problems inherent in that process. The difficulty that is probably best known is a boiler explosion due to excessive pressure buildup. By the 20th century boiler explosions were relatively rare on Canadian waters
and there is no record of any boiler explosion having occurred on the Canadian section of the Yukon River or its tributaries. In part this was due to annual boiler inspections undertaken by government steamship inspectors as well as to the development of effective safety valve systems. The safety valve would open releasing excess steam if the pressure exceeded a certain level. Another factor was that engineers had to pass stringent exams before they could be put in charge of such engines. More routine problems that had to be rectified continuously were scale and soot build-ups. Water, unless it has been distilled, contains dissolved impurities, the most common of which are compounds of calcium, magnesium and silica. Calcium or magnesium may unite with sulphates to produce compounds which are scale forming. Silica, found in sand and glass, forms an exceedingly hard, dense scale - actually glasslike. The problem with scale is that it is an efficient non conductor of heat. The build up of scale, therefore, results in a reduction in boiler efficiency because less heat is absorbed by the boiler water. With the scale preventing the transfer of heat from the gasses to the water, the heating surfaces of the boiler may reach a dangerously high temperature resulting in serious damage to the tubes and even the boiler shell itself. As with scale on the water side, soot on the fire side of the tubes can cause certain problems. The sulphur content of soot
combines with any moisture to form a sulphurous acid which is highly corrosive. Hence a minor leak in any of the tubes may cause a serious defect to develop if it is not rectified. Soot build-up in the tubes, even under normal circumstances, is unwanted as it could reduce the effective draught through the tubes and also inhibit direct heat transfer from the combustion gases to the tubes, thus causing a lowering of overall boiler efficiency.

Both soot and scale build-up, although bothersome, were fairly easily rectified. The soot was eliminated by cleaning or "punchigg" the tubes with a long, bottle-like brush with metal bristles. This operation was fairly straightforward and was performed daily. Access was had to the tubes through two doors located at the back or smoke box end of the boiler. Scale removal was accomplished by both mechanical removal and water treatment. Mechanical removal of scale was effected while the boiler was idle and empty. The accessible parts of the shell, drums, heads and braces were chipped with a dull chisel or scaling hammer, care being taken not to score the metal. Scale deposits on external surfaces of fire tubes were, in all probability, vibrated loose with a tube rattler or by shaking a long heavy bar in each tube. Care was taken in the descaling operation to remove all loosened scale from the boiler before it was closed for operation, since serious damage could result to the boiler if this were not done. The
damage would have been caused by over-heating of those areas of the boiler where sludge and scale had accumulated to such an extent that they were no longer subjected to the cooling effect of the water. Water treatment, which in the Klondike's case involved the addition of a linseed filter to the feed water system, could also reduce scale build-up, in this case probably through the removal of silica in the form of sand.

The main exit by which loose scale and sludge were eliminated from the boiler was through the blow-down valve and fittings located at the lowest water space of the boiler. Besides allowing for the removal of loose scale and accumulated sludge in the boiler, the blow-down valve also served another function, that of rapidly lowering the volume of water in the boiler when this became too great, such as could occur when there was a sudden change in load requirement.

The combustion gas flow in locomotive boilers is straight through the tubes and out. Unless quite long tubes are used, the gas exit temperature are comparatively high, with a resultant loss of efficiency since not all of the heat energy available in the fuel has been used. On the Klondike a device called an economizer was installed in the exit path of the flue gases to reclaim some of this lost energy. The economizer consisted of a number of tubes through which the feed pump supplied water to the boiler.
Efficiency was increased by the fact that for every 10 degree Fahrenheit rise in feed water temperature, the overall boiler efficiency increased by about one per cent owing to the savings in fuel that would have been required to heat the boiler water an equal amount. An added advantage to using an economizer to increase the feed water temperature was that temperature stresses, caused by the entry of cold water into the hot boiler, were to a great extent avoided by feeding water at a higher temperature.

Once the boiler was operating at its working pressure, which in the case of the Klondike was close to 184 pounds per square inch, steam would be directed through a pipe from the boiler to the engines, which converted the heat energy that had been extracted from the fuel into mechanical work. The theoretical basis for this conversion is known as the first law of thermodynamics which states that when mechanical work is transformed into heat or heat into work, the amount of work is always equivalent to the quantity of heat. If this is put into practical terms one would come up with the following outline. The amount of energy required to raise the temperature of one pound of water one degree Fahrenheit is the British Thermal Unit. The amount of energy required to physically raise a one pound weight of any substance a distance of one foot against gravity is known as the foot-pound. The mechanical equivalent of heat is, therefore, the number of foot pounds of mechanical
energy created by every British Thermal Unit of heat. It has been found by experiment that one BTU is equivalent to 778 foot-pounds. Therefore for every 778 foot-pounds of work done by an engine there should ideally be a one degree Fahrenheit drop in temperature. In actual practice there is a greater temperature drop but this has to do with other physical conditions such as heat loss through the engine walls and so forth. In a steam engine the carrier of the heat is water which has been converted into steam through the absorption of heat. Steam is a gas and has all the properties of a gas. For all intents and purposes steam can be considered to be a perfect gas in this rough outline, and as such behaves in the manner as outlined in the perfect gas law namely PV=CT; or stated more fully, pressure times volume is equal to a constant times the temperature. From this equation it can be seen that when there is a drop in temperature due to work being done, the PV relation must change for the equation to maintain its balance. In a working steam engine this means that when the volume of steam increases by a definite amount in the engine cylinder, the pressure must decrease by a greater amount due to mechanical work being done than if just the volume had changed without a drop in temperature. The steam that eventually leaves the system has, therefore, a greatly reduced pressure and temperature but a substantially increased in volume.
The working of a high pressure steam engine can be visualized fairly simply using the above synopsis as a guide. A high pressure steam engine is nothing more than a cylinder of a fixed size closed off at both ends, with a moveable surface or circular plate called a piston equal to the cylinder's diameter, moving back and forth parallel to the cylinder's side through the action of steam. The apparent complexity comes from the equipment necessary to regulate the steam input into the cylinder and to transfer the reciprocating motion of the piston to the location where it is needed. If steam at a high pressure is admitted to the side of the piston at one end of the cylinder through a series of valves, the piston can do one of two things, it can stay where it is or it can move towards the other end of the cylinder. The action of the piston is dictated by the pressure difference between the two sides of the piston. If steam is put in on one side of the piston at 150 pounds per square inch and the pressure on the other side is less than that, say 100 pounds per square inch, the piston, because of the increased pressure exerted on one side, will move to try and equalize the pressure on both sides of the piston. If an exit point is made from the cylinder on the side with less pressure and the steam on that side is allowed to escape, the piston will move more readily to that end of the cylinder. If the exit noted above is closed and steam at 150 pounds per square inch is introduced into the side of
the piston just evacuated, and if an exit port is opened on the other side the piston will move back to its original position. When the above operation is repeated continuously a reciprocating motion of the piston is set up.

A study of thermodynamics makes it clear that engines have to work at high temperatures and pressures in order to increase their theoretical efficiency. One way that was developed in the 19th century to use a store of heat energy to the best advantage is to pass the steam through a small high pressure cylinder, and then into a larger low pressure cylinder. The reason for the low pressure cylinder being larger is that the steam had expanded in the high pressure cylinder and thereby increased in volume. Various configurations of compound engines have been developed; however, the Klondike's engines are known as tandem compound engines as the two cylinders were in line and the two pistons were linked by a rigid piston rod.

The question could be asked why high pressure steam is used with its inherent dangers of boiler explosion, to drive a vessel and not low pressure engines and a condenser. As a general rule of thumb, it can be noted that low pressure engines tended to pre-dominate on the inland waters of eastern North America in the 19th century whereas high pressure engines were prevalent on so-called western rivers including those of the Yukon. There are some very specific reasons why high pressure engines were the ideal choice on
the latter. A low pressure engine and condenser occupies more weight and space for the same horse power produced. Such characteristics do not pose a problem on deep waterways but would tend to be very troublesome on shallow waterways (like the Yukon) where the weight of a vessel must be kept low so that the vessel can operate with a shallow draft. As there is more material involved in the manufacture of a low pressure engine its cost is higher. A low pressure engine has less reserve power and is, therefore, less able to deal with emergencies. A high pressure engine has ample reserve power limited only by the strength of the boiler, the pipes and the cylinder. Even taking into account the fact that a high pressure, single cylinder engine is less fuel efficient than a low pressure engine since it exhausts steam at a much higher pressure and temperature, the extra maintenance costs, the higher initial cost and the greater weight and volume of the latter, more than overcome the inefficiency associated with the high pressure engine.

There is one basic design problem associated with using high pressure steam to move a piston in a cylinder. Maximum power is obtained by allowing the steam to enter the cylinder during the whole time it takes the piston to move from one end to the other (this is called the piston stroke); but maximum efficiency is achieved by allowing steam to enter the cylinder for only a fraction of the stroke. When the steam inlet valve is closed, the trapped
steam still exerts a pressure on the piston, which continues to move as long as there is a pressure differential between the two sides of the piston. With the movement of the piston, this pressure drops because the steam is expanding to fill a larger space. Now the problem for the designer is to achieve a balance between high power with low efficiency and low power with high efficiency. Such a compromise between efficiency and power would not be a problem if the demands on the engine power were constant. However, navigation conditions on the Yukon and its tributaries were not constant and valves were used to control the steam so that power could be varied and the engines could easily be reversed. In the different types of reversible engines, and variable or automatic cut off engines, the valve gear includes a mechanism by means of which the motion of the valve is governed so as to change the direction of the motion of the engines or to vary the amount of work done in the cylinder. With variable cut off gears the amount of work done in the cylinder can be regulated, while the engine is in operation, by varying the valve motion so as to change the cut off point of the steam. In the Klondike's case the valve gear controlling steam flow and cut-off was mounted directly on each cylinder, with the engine crosshead controlling the timing of steam cut off to the cylinders and the angle of the connecting rod controlling the timing of steam admission and exhaust. Although the Klondike did have
a hand reversing gear, the steam servo-motor was used to reverse the main engine valve timing mechanism since the hand gear required quite a bit of physical effort. Even though it was seldom used, the position of the hand gear did indicate whether or not the reversing engine was functioning properly.

Once the steam has done all of the mechanical work required, there are two ways of using it to further advantage to the system. One could, as Richard Trevithick had shown in the early 19th century, vent the exhaust steam into the flue of the boiler to increase the draught through the fire box. This is the way in which the used-steam was eliminated on most of the riverboats that plied the Yukon River. It was this exhaust steam that also gave the riverboats their peculiar locomotive chugging sound as they steamed along the river. This manner of steam expulsion increases the efficiency of the system to some degree, as the forced draught causes more air to be pulled through and over the burning fuel pile, thereby increasing combustion and resulting in more energy being released as heat. This type of forced draught is also to some extent self-regulating, since the more power that is called for the larger the quantity of steam sent up the flue, which of course results in a greater draught being created. The opposite also holds true of course. This use of exhaust is not all that efficient but because of weight and space
limitations, especially on the smaller Yukon riverboats, it was the system most commonly used. The procedure that resulted in the engine giving more power was to condense the steam into water using a condenser. A condenser is a nest of tubes arranged in a metal shell. The steam from the low pressure stage is drawn into the tubes by a vacuum pump. It is immediately condensed to water by the cooling effect of river water pumped through the tubes by the action of a circulating pump. The condensed steam, in the form of fresh water is then fed into the boiler by means of a feed pump, there to be reconverted into steam. The equipment necessary for the above operation increases the weight of the vessel and reduces the space available for cargo, especially on the smaller vessels. These factors probably outweighed any increase in fuel efficiency obtained through the use of a condenser. The greater efficiency and power come from the fact that in a non-condensing engine the side of the piston that is being exhausted has steam in it at a certain pressure which is, in all probability, greater than atmospheric. To evacuate this steam requires work, work that could be used to perform the main function of the engine, which on the riverboats was to turn the crank of the paddlewheel. When a condenser is placed in the system, a partial vacuum is formed on the exhaust side of the cylinder when the steam is condensed, which means that the piston does not have to perform as much work to overcome the back
pressure on the exhaust side. This of course results in a saving of fuel. Another advantage of using a condenser is that the condensed steam, as water, is returned to the boiler. This water, as it has been in a sense distilled, has few dissolved solids in it which can contribute to scale build up. The forced draught in the Klondike's case was obtained through a live steam line being placed in the flue, which, although wasteful of steam, gave greater control of the draught and was not as wasteful of steam as was the non-condensing engine.

The steam engine produced a reciprocating motion that had to be converted into rotary motion to turn the paddle wheel. This was accomplished through the use of a crank and connecting rod. The free end of the piston rod, a rod connected directly to the piston, was constrained to move in a straight line by a crosshead and guide rails. A connecting rod, called a pitman arm, joined this crosshead to the crank making a direct system of links from piston to crank.

The pitman was made out of wood. Wood served the useful purpose of absorbing to some degree the shocks caused by striking obstructions and the frequent sudden stoppages of the wheel, and thus minimized damage to the machinery. A more pressing reason for the use of wood in the case of the pitman was the difficulty of making so large a member from iron, whether cast or wrought. Pitmans were ordinarily made of pine timber, reinforced with straps of iron on either side.
Even when reciprocating motion had been converted to rotary all of the problems with using a piston steam engine as a power source had not been taken care of. If one relied on a single cylinder engine one would run into two difficulties. The first would result from the fact that when a piston is at either end of the cylinder, the piston rod, connecting rod and crank all lie in a straight line, and no matter what pressure is put on the piston the system will not function until the crank has moved a few degrees off the dead center. If a vessel that was using such a system stopped with the engine in the above position, the crank would have to be manually rotated off of this position. The second problem encountered when using only one cylinder is that the maximum turning effect, or torque, occurs about half way through the stroke, reducing to zero at dead center. One solution in the 19th century to this problem was to use a fly wheel which stores up energy during the maximum torque period and releases it as the crank passed the dead center position. Both problems can be overcome through the use of two engines which are interconnected through a joint crankshaft that has two cranks, one for each engine, made at right angles to each other. By this arrangement, when one piston was at dead center, the other would be at maximum torque, and as one crank approached maximum torque from zero, the other crank's torque would be diminishing by an approximately equal amount as it left
maximum torque going to dead center. Such an arrangement therefore produced steady torque, in addition to always having one cylinder off of dead center. The use of two engines eliminated the need for a fly wheel; however, these were still in use in the 19th century although much smaller than those found on vessels employing only one cylinder. By the time the Klondike had been built the flywheels had been done away with altogether as it was recognized that the paddlewheel itself, the shaft of which was the crankshaft interconnecting the two cranks, acted as a flywheel.

The final stage in the process was conversion of the rotary motion given to the crankshaft by the two steam engines into the continuous rectilinear motion of the vessel. Historically, this conversion was the easiest to effect and predates the steam engine by many centuries. If one arranges a series of blades radially in a circle around a shaft and places the bottom of the circle so formed in water, the force exerted by the blades of the rotating shaft against the water will propel the vessel. If the paddlewheel, consisting of a shaft to which blades (or buckets) are attached, is placed at the back of a vessel, a sternwheel vessel is born.

There is a good reason which should be mentioned in conclusion as to why a paddlewheel was made primarily of wood. When an arm or bucket of a wooden wheel was smashed from striking a snag, ice, or the shore, the broken pieces
could be quickly replaced and the operation of the vessel resumed. In the same situation a steel paddlewheel was likely to be so bent and distorted as to require difficult repairs by forging before it could again be placed into motion.
The (Steamship) the S.S. Klondike

Until the 1920s the economy of the Yukon Territory was almost entirely dependent on gold mining. The centre of gold mining was located in the Klondike region, an area about 800 square miles in extent bounded on the west by the Yukon River and on the north by a tributary of the Yukon named the Klondike. Dawson, situated at the confluence of the Yukon and Klondike rivers some 460 miles downriver from Whitehorse, was the supply and distribution centre for the region.

During the 1920s a major shift in the economic centre of gravity of the territory took place following the establishment of an important silver-lead mining industry in the vicinity of Mayo, located on another tributary of the Yukon River named the Stewart. By the mid twenties, the value of silver-lead production had surpassed that of gold mining.

Development in and of the Mayo region presented a major challenge to the territorial transportation system. Based largely on a complementary rail and riverboat service during the open season of navigation and dominated by a single
company, the White Pass and Yukon Route, this system had hitherto been marked by two attributes: the northward movement of bulk freight from the railhead at Whitehorse downriver to Dawson, and a return trip to Whitehorse characterized by a substantial degree of unused steamboat capacity because gold was a high value/low volume commodity which required minimal space to carry out of Dawson. In other words, in so far as the movement of cargo was concerned, transportation was virtually a one way proposition. Such was not the case with silver-lead ore. Not only did the transport of silver-lead ore require facilities for carriage in bulk, it reduced and often eliminated the problem of unused capacity. This was an obvious advantage to the carrier, although it should be noted that the advantage was moderated by the fact that the previous pattern of common carriage, which was based on a lopsided "I" following the course of the Yukon River between Whitehorse and Dawson, was modified to a "Y" shaped pattern with Whitehorse at the base and Dawson and Mayo at the respective tips.

As previously noted, the White Pass and Yukon Route was the dominant transportation company in the territory. In 1900 this company had completed a railway between tidewater at Skagway, Alaska and the head of through navigation on the Yukon River, Whitehorse. The following year the White Pass and Yukon Route set up a river division named the British
Yukon Navigation Company and began operating a fleet of sternwheelers. During its first decade, the British Yukon Navigation Company pursued a vigorous policy of eliminating other steamboat companies then operating on the "upper" or Canadian section of the Yukon River. Ownership of the railway and a general decline in transport business following the Klondike gold rush gave the company a potent advantage. By 1910 the company had pretty well eliminated all common carrier competition in the Yukon and in 1919, when a major discovery of silver lead ore was made near Mayo, the BYN, along with its sister concern, the American Yukon Navigation Co., enjoyed a monopoly on common river carriage.¹

The existence of a monopoly did not mean that the company had an easy time on the river as the shortness of the shipping season and the fluctuations in river depths - particularly between the Yukon and Stewart rivers which reached their high water marks at different times - all conspired against a smooth, cheap and continuous navigation system. To move the high volumes of silver-lead ore from Mayo the British Yukon Navigation Company depended to a large degree on barging, a practice that had been a familiar feature of river transport since the early 1900s. Whenever a riverboat pushed a barge its fuel consumption and operating time increased by half thereby increasing costs to the company besides playing havoc with shipping schedules.
The company, taking advantage of the upswing in business, decided to design and begin construction of a vessel in 1928 which could carry the same amount of freight as a regular vessel plus barge and thereby eliminate the need for barging. The result of this decision was the construction of the riverboat S.S. Klondike and subsequent to its sinking in 1936, the building of S.S. Klondike II, the two largest vessels ever to navigate the upper Yukon River.

Construction of Klondike I
Klondike I was designed as a light draught freight carrier with a deadweight capacity of 300-350 tons upstream and 250-270 tons downstream. The upper housework was limited to the forward half of the ship for reasons of weight, and was intended to accommodate only a limited number of passengers, the ship's officers and some of the crew. To keep the freight deck expressly for cargo, all functions relating to crew and passengers, with the exception of the deck hand's and firemen's quarters, were transposed to the saloon deck; hence the crew's mess and galley were not located on the freight deck as was the case on some of the other BYN vessels.

The difference in function between the Klondike and other British Yukon Navigation Company vessels such as the Casca and Whitehorse was one of degree. The primary purpose of the Klondike was to move freight, and the carriage of
passengers was clearly secondary to this function. The *Casca* and *Whitehorse* on the other hand were more in the nature of dual-purpose passenger-freight vessels. In contrast to the *Klondike* a larger percentage of the housework on these vessels was allocated to passenger carriage, although freight was also carried. Their schedules were, furthermore, tied to those of the coastal vessels calling on Skagway, whereas the *Klondike*'s was not. The *Klondike* was designed, however, so that her housework could be considerably enlarged to handle more passengers should this be required.³

The vessel that was eventually to slide down the skid ways in 1929 to take its place in the Yukon transportation network was 210.25 feet long with a 42.1 foot beam. The wheelhouse or control centre of the vessel surmounted the forward part of the topmost, or Texas deck from which a clear view of the river was obtained. Below it there were ten Texas deck cabins; in 1934 the number of Texas deck cabins was increased to fourteen. These cabins sat on top of a skylight deck, so called as it provided natural light to the saloon, dining and galley areas of the saloon deck below through a continuous series of windows located in the short bulkhead separating the skylight deck from the boat deck. Access to the Texas deck cabins from the boat deck was provided by two step stairs. The boat deck also held such necessitities as water barrels, life rings and two of
the vessel's four lifeboats. Below the boat and skylight decks was the main passenger area or saloon deck. The forward half of this deck contained two banks of passenger cabins, one on either side of the deck, as well as the observation lounge, the dining area, and the galley and the crew's mess. Aft of the saloon deck housing there was a large open space which was used by both crew and passengers, and contained two water barrels for use by the galley crew, two other lifeboats, a work boat, two meat lockers and other equipment. Below the saloon deck was the main cargo area, engine room and the deckhand's and firemen's quarters. The main cargo area, which comprised approximately four-fifths of this deck, contained the boiler, located amidships just aft the forward bulkhead. The boiler, a locomotive boiler in design, with a working pressure of 184 lbs per square inch, was acquired originally in 1901 for the vessel Yukoner from the Polson Iron Works in Toronto. The engine room and crew's quarters were located at the aft end of the freight deck between the freight compartment and the transom. The Klondike's two tandem compound, jet condensing sternwheel steamboat engines were specifically made for the vessel by the Gillett & Eaton Co. Inc. located in Lake City, Minnesota. Each engine had two pistons (a 17 inch high pressure and a 28 inch low pressure) which operated on a six foot stroke. The engines were rated at 71.5 nominal horse power and 525 indicated horsepower. The whole
superstructure or housing sat on a shallow draught carve built hull.

The lines or curves of the hull were apparently worked out by H. Wheeler, president of the White Pass and Yukon Route, and Bert Fowler, the foreman of the shipyard. It is not known if a naval architect was consulted. The design was said to have been executed on a half model with the stations being taken off of the model by calipers and transferred to a platform constructed alongside the area where the ship was to be built.\(^4\) None of the surviving shipwrights can recall seeing a set of blueprints for the construction of the Klondike although a three sheet set was submitted to the Board of Steamship Inspection in 1928. The curves of the hull were such that they guided the water under the hull with minimum resistance so that at times a maximum speed of 15 knots could be obtained on Lake Laberge.\(^5\)

It has been said that the design of the Klondike's hull was an important innovation and that it was quite radical. Unfortunately, in the absence of a comparative study treating the hull designs of British Yukon Navigation Company and other sternwheel vessels it is impossible to evaluate the "uniqueness" of the Klondike's hull. In any event it should be noted that a number of other (non-Yukon) shallow draft riverboats in Canada and the United States had cargo-draft ratios which equalled or excelled those of the Klondike.
Work got underway on the **Klondike I** in 1928 as soon as the spring repair work had been finished on the other riverboats. By the end of the season, which had been an extremely busy one for the shipyard crew, the hull had been completely planked, the boiler installed and the cylinder timbers were in place. Work that had yet to be completed included the chaining, that is installation of the hog chains, and caulking of the hull and the construction of the housework and paddlewheel, all of which were finished the following year.\(^6\)

A number of people who knew Herbert Wheeler, have stated that the **Klondike** was the "apple of his eye" and that he regarded the vessel as one – if not the – crowning achievement of his career. Certainly, very little expense was spared in the construction of the ship. New high pressure compound condensing engines and associated systems were ordered for the new riverboat. All crooks were made out of natural knees rather than bolted sections.\(^7\) The result, when the **Klondike** was launched on 5 July 1929, was a very solidly built, light weight craft driven by powerful engines.

**Operational History of Klondike I**

Trials of the **Klondike** were held on 17 July 1929 and she was found to live up to expectations with the result that she was put into active service the following day.
Not everyone was as enthusiastic as Wheeler about the Klondike, either before or after her launching, and even to-day the vessel has some detractors. Prior to launch concern was expressed about her size, as some boatmen felt that she would have to be handled in the same way as a boat pushing a barge, that is to say that bends would have to be drifted and a considerable amount of handling on the downstream runs would be required. These fears proved to be unfounded as the Klondike handled every bit as well as smaller riverboats such as the Casca and Whitehorse. The other criticism still levelled to-day, is that the Klondike should never have been built; that a vessel half its length with the same width and the same power to be used as a barge pusher, something like the barge pushing tugs of the Mississippi and Ohio Rivers of the latter 19th and early 20th centuries, would have been more economical. Such a criticism ignores the fact that the Klondike was built to be adapted into a passenger vessel if and when required. This is not surprising when it is considered that in 1928, when plans were made to build the Klondike, the Whitehorse and Casca, the two principal passenger carriers in the BYN fleet, were respectively 27 and 17 years old. Such an adaptation would obviously have been impossible had the Klondike been designed along the lines of a tug. In any event such criticisms were not universally held, for others regarded the Klondike as the best riverboat that every plied
the Yukon River, since it was extremely versatile and could outperform everything else on the river.11

Between 18 July 1929 and the end of navigation that season on 6 October the Klondike managed to make ten trips between Whitehorse and the Stewart River to move part of the large quantity of ore presented for shipment that year. Her performance was gratifying as she moved 3111 tons of ore upriver that year, an average of 311.1 tons per trip. On her best trip she moved 325 tons of ore from Stewart Landing to Whitehorse in four days, one hour using 82½ cords of wood, which compared more than favourably with the previous record set by the Aksala when she moved 300 tons of ore in 5 days 7 hours 5 minutes, using 133 cords of wood. Passenger traffic, however, appears to have been minimal as the Klondike carried only 40 in her first season of operation. The following year, 1930, the Klondike was in operation the full season. She was launched on 29 May, and handled 4165 tons of ore upstream in 14 trips (for an average of 297.5 tons per trip), before being hauled out on 21 September of that year. The quantity of ore presented for shipment declined substantially 1931 and 1932 because of the depression and diminishing reserves, the Klondike was not launched in either of those years. In 1933, it was found necessary to launch the Klondike on 14 August to move 1450 tons of ore. This work was done in six trips and it was noted that that was approximately 500 tons less that what
she was capable of. The fact that the Klondike could maintain the tourist schedule even though carrying a full load made the company look favourably towards her as a possible passenger carrier. She was therefore put on the Whitehorse-Dawson run increasing her passenger trade from 40 and 45 in her first two years of operation to 150 in 1933. The year 1934 saw another full year of operation for the Klondike as she was launched on 31 May, and carried 3715.5 tons of ore upriver in 17 trips (an average of 212.7 tons per trip) before she was hauled out on 8 October. The passenger trade became an even larger part of her operation for she moved 655 passengers in the 1934 season, which was made possible in part by the addition of four Texas deck cabins to her housing while she was in port in Whitehorse on 7 July, and by the fact that she was now on the Whitehorse-Dawson run. In 1935, her last full year of operation, Klondike I made 14 trips to Dawson; unfortunately, the tonnage and number of passengers carried are not available. Mention has not previously been made of the Klondike's downriver freight. This consisted of general merchandise, machinery, foodstuffs, etc. As far as can be determined, the average downstream cargo was approximately two-thirds of the tonnage of the load carried upstream or around 200-250 tons. At the outset, the 1936 season, appeared no different than any previous season; but on her third trip of the season, in a stretch of river below the Thirty Mile, Klondike I's active days came to an abrupt end.
Sinking of the Klondike No. 1

On 12 June 1936 five miles below Hootalinqua the Klondike was holed and sunk. At the wheel was a new pilot Malcolm Macaulay, who, prior to this trip, had been the Klondike's first mate. The master, Charles Coghlan, had just gone down to the dining room for breakfast after taking the craft through the Thirty Mile, a very difficult section of the river, when the Klondike struck the bank, losing all control. The sinking was due to pilot error or, more precisely, pilot inexperience. According to another steamboat master:

"He was just coming around a point and he kept too far out. And there was a big rock bluff down this side and of course these boats, when you come around this sharp point, they're ... sitting on top of the water, maybe 3, 3½ feet and they slide. And he didn't allow for that. Of course the boat came along and just crashed right into this rock bluff and it just tore the whole side out of her."12

The Klondike apparently hit twice with the stern making contact first with the bank and subsequent to that she hit a rock or reef which tore the steering lose so that by the time Coghlan reached the wheelhouse the rudders would not respond to the wheel and the Klondike was at the mercy of the current.13
The Klondike did not sink all at once but drifted and was pushed downriver by the current for at least two miles after she had struck. Attempts were made to get a line to shore but the current was too swift; furthermore, the ship was spun around by her encounters with the shore which aggravated all attempts to stop her from drifting.

After the vessel was holed and all control was lost the fact that the ship would sink became evident and the foremost thought in everyone's mind was to get ashore in the most expeditious manner possible. Upon subsequent contacts with the river bank some people jumped to shore. Not everyone could take advantage of these brief encounters with the shoreline as some of the passengers were trapped in their cabins due to jambed doors and had to be freed before they could effect an escape. Lifeboats were lowered; unfortunately, the boats shipped large quantities of water, necessitating frantic bailing by the occupants. One boat sank just as shore was attained. That this problem was attributable to a failure to insert the drainage plugs can be surmised from the fact that the lifeboats had been checked approximately 10 days prior to the accident and found to be water tight and were, moreover, subsequently transferred to the Klondike II. One of the boats on board had been used mainly as a workboat and was in good working condition and equipped with an out-board motor. This powered lifeboat was used to get those who were still on board
ashore when the Klondike finally stuck fast, and to ferry those people to the west shore who had landed in other areas. One crew member was forced to jump on board one of the main gang planks as it was swept away, and ride this down river for quite a distance before he could pull in a drifting oar and paddle ashore, with the result that it took him until evening to get to the camp that had been set up by the others.\textsuperscript{16}

Besides the passengers and crew, the powered work boat also took a vital piece of equipment to the shore, namely the emergency telephone, with which the purser tapped the telegraph line and informed Whitehorse of their plight and location.\textsuperscript{17} The steamer Whitehorse left the afternoon of the disaster with food, a rescue crew and other necessities,\textsuperscript{18} and arriving at the wreck site by midnight to pick up the passengers and most of the ship's company.\textsuperscript{19}

Once the ship grounded it was not very far from the shore and the camp that had been set up, and hence it was relatively easy to return to the Klondike for supplies. As only the freight deck was under water, the supplies in the galley area were readily obtainable, as were blankets and the personal effects in the various staterooms.\textsuperscript{20} Life on shore while awaiting the Whitehorse, was not all that comfortable, however, as this was the height of the mosquito season.
The Klondike was en route to Dawson when she sank and was carrying approximately 250 tons of general cargo for the communities and settlers downriver from Whitehorse. Most of the material that was on the freight deck that could float was swept away and supplied many an encampment downriver, Indian and white. What was left in the cargo area was water damaged. Some personal belongings in the saloon deck cabins were also water damaged for that deck was inundated with water at one period in the ship's downbound odyssey after the Klondike was holed. Some of the lost cargo belonged to some of the passengers on board. A recently married couple lost all of their possessions including furniture. Two geological survey parties, one Canadian, the other American, lost all of their equipment. Most of the commercial travellers on board lost all of their samples and order books causing considerable inconvenience. The ship was carrying four horses, two of which could not be saved. Not all of the lost cargo ended up downriver; cigarettes, for example, went up in smoke right at the campsite.

Whether the first crew that was sent down with the rescue ship Whitehorse was sent to dismantle what would be saved of the vessel, seems doubtful, as the extent of the damage to the Klondike could not have been known. Moreover, consideration appears to have been given to an attempt to refloat the Klondike through the use of balloons.
inserted in the hull and then inflated. This attempt, if it was carried out, failed, probably due to too much accumulation of silt and gravel in the hull and the size of the hole.25

After the condition of the Klondike had been apprised, a salvage crew was sent to retrieve everything that could be saved, such as the machinery, fittings and superstructure. The Nasutlin was used as a base of operations and carried and barged what could be salvaged back to Whitehorse. In the subsequent building of Klondike II all of the machinery and some of the superstructure, such as the king posts and possibly even the wheelhouse of the first Klondike were used. 26

Construction of Klondike II and Subsequent Structural Alterations to 1953

The sinking of the Klondike I did not obviate the need for a riverboat of the same size and design; however, times had changed and the relatively optimistic times of the twenties had given way to the depression of the thirties which probably resulted in a slight difference of attitude on the part of the company. When the Klondike sank, everything that could be salvaged from her was and a good proportion of this was used in the construction of the new vessel.27

This was a common practice thoughtout the whole riverboat era in both the United States and Canada. The Klondike II
was not, however, built to the same specifications as the original. Natural knees had been used on the first Klondike, whereas bolted timbers were used in most areas on the number II. Klondike I had had tongue and groove cedar panelling throughout, the II was fitted with masonite panels on the cabin interiors.

The need to replace the Klondike with something equivalent must have been realized fairly quickly for the call went out to Vancouver for shipwrights almost immediately after the Klondike I sank. Mr. Syd Smith was contacted and he got together a crew of eight which landed in Whitehorse on 4 July 1936. These men were hired in Vancouver with the promise of free transportation if they stayed the required time; however, once in Whitehorse they had to pay for bunkhouse accommodation and meals. The work, as with all construction jobs, had its hazards, for on 4 August of that year the staging used to put up the transom gave way sending three men for medical attention. The construction crew remained in Whitehorse until 18 November, by which time the hull had been finished and work had started on the superstructure.

The Klondike II was built employing the basic design used for the No. I in 1928-1929. Drawings were made from the half model used for the Klondike I; there may have been a full set of blue prints; however, if they were produced no trace of them remains today. All changes from the
original design were apparently approved by the steamship inspector by telephone, as they did not involve any major component and apart from differences in overall dimensions no record of such changes, can be found today.\textsuperscript{33}

Most of the changes to the superstructure were minor in nature, such as the altering of the window-door sequence of the freight deck housing. The most obvious major change took place on the Texas deck. The Klondike I, when she sank, had 14 cabins, whereas the Klondike II was built with 16 cabins. This probably reflects the company's decision to use her more as a passenger carrier. The hull changed only slightly in dimensions being 0.25 feet shorter and 0.2 feet narrower than the Klondike I.

Various modifications and additions were made to the Klondike II throughout its operating life, most of which were effected in the years just after its launching and in the years before its final voyage in 1955.

The changes that are observable in the 1937 to about 1942 period seem to have been minor modifications to make the ship more habitable. Vents were installed sometime during 1938-1939 to improve the circulation of air throughout the areas occupied by the crew and officers. Two bell mouth vents were secured to the aft saloon deck for air circulation in the aft freight deck and crew's quarters areas. A smaller bell mouth vent was attached, at the same time as the above two, to the top of the meat locker. When
constructed the Klondike had only one vent on the Texas deck which serviced the washroom, linenlocker and possibly the two cabins aft of those two. The proximity of the stack and exposure of this deck to direct sunlight made the rest of the Texas deck cabins occasionally unbearable, and taking into consideration that most of these cabins were occupied by the ship's officers it was not long before vents to those cabins made their appearance.\(^34\)

The garbage disposal system for the galley area was not the most sophisticated, as most refuse went over the side of the vessel. The possibility that some of this waste may not have cleared the ship's housing appears not to have been taken into account when the vessel was built; however, this deficiency was soon rectified through the addition of a slop chute extending down from the saloon deck, along the port side of the ship.

Aft of the slop chute on the port side of the observation deck, a metal ladder was installed within the first two years of the ship's operation. There was a companion way on the aft starboard side of this deck which led down to the freight deck, but there was no means, in case of an emergency, by which one could exit directly to the guard of the vessel. Whether the absence of such an emergency exit was the cause of the ladder's addition to the freight deck housing is not known.

The only other change that is obvious in the 1937-40
time frame was the replacement of the lozenge-shaped KLONDIKE sign board, attached to the front of the wheelhouse bulkhead, with a rectangular sign. The lozenge-shaped sign that was in place until 1939 appears to have come originally from the Klondike I and may simply have been worn out due to weathering in its exposed position.

The period between the initial changes and additions and the major modifications that were to take place in the 1950s was not completely devoid of activity. Around 1945 canvas was added to the external tongue and groove bulkhead of the wheelhouse sides and the external forward semicircular bulkhead of the Texas deck cabins. The addition of canvas in the above noted areas was in all probability to prevent leakage of water through those exposed bulkheads.

In 1950 four additional cabins were built on the Texas deck. This was done ostensibly to have extra cabin capacity available if something should happen to the Casca or Whitehorse. From what can be determined from the photographic evidence, there was probably very little to distinguish these new cabins from those already in place on the Klondike.35

The galley was remodelled in 1950. In part this remodelling was necessitated by the addition of the four Texas deck cabins which resulted in the elimination of the galley skylight. A more important factor, however, was the
implementation of far more stringent fire regulations for vessels following the *Noronic* disaster of 1949 wherein 119 lives were lost when the vessel burnt in Toronto harbour. The galley skylight, located on the skylight deck, had provided natural light for the galley as well as much needed ventilation. With its elimination these functions had to be provided by other means. Windows were cut into the aft skylight deck bulkhead, thereby allowing natural light to enter the galley from the aft as well as the port skylight bulkhead. A fume hood was installed over the stove with the fumes being exhausted by a fan located in one of the port-side skylight windows through a stack located alongside the new Texas deck addition. The fire regulations forced the company to clad the galley's bulkheads and deckhead with an asbestos coating. All wooden shelves were also replaced with metal ones. This appears to have been the time that another stove was installed in the galley, for no repairs to the asbestos coating were in evidence as the stove's insertion required removal of part of the aft bulkhead. The stove, which appears to have been substantially larger than the original stove installed in 1937, also required more room than was afforded by the original layout of the galley. Part of the starboard bulkhead was therefore recessed into the crew's mess, located directly starboard of the galley. The changes effected to the galley that have been noted above are only
some of the more obvious ones as the galley underwent a complete refurbishment at that time.

The fire regulations brought into effect in 1950 may also have dictated the installation of more fire hydrant stand pipes throughout the vessel. When the Klondike finished its final run there were at least eight fire hydrant stand pipes in place throughout the passenger area of the ship, four more than in 1937. It is possible that these stand pipes were installed when the vessel was converted into a cruise boat in 1954, when the additional housing would have cut off certain parts of the ship from access to some of the existing hydrants. The dating is, unfortunately, confused by the fact that a new fire pump was installed in 1950, which allowed a greater pressure. New hydrant stand pipes may indeed have been installed when the new pump was put in 1950; however, the need for them was clearly not there until the 1954 conversion when the additional housing cut off sections of the vessel from the four original hydrants.

Conversion to Cruise Service

The Klondike, through an arrangement with CP Air, was converted to cruise service in 1954 which resulted in major changes in silhouette and internal fittings. At this time the saloon deck housing was extended aft to the transom. The whole of this new housing was constructed as a
fancy lounge with easy chairs, a bar and murals depicting night life in Dawson during the gold rush era. The conversion in general was not accompanied by major structural changes in the original passenger areas. Modifications in those areas were basically in the nature of increased amenities such as the addition to each cabin of running water and hot water radiators, fancier drop lights in the observation lounge and dining areas and more extensive wall decorations. With the increase in passenger load there were, of course, additional lavatories required and this was accomplished through the conversion of some of the staterooms into washrooms. Additional crew's quarters were constructed on the freight deck near the center freight doors to accommodate the increase in the ship's company. The freight deck was at this time not used to carry freight or wood fuel as freight was no longer being carried on the riverboats and the Klondike had been converted to oil in 1952.

The interesting aspect of the conversion from freighter to passenger carrier was that the allowable overnight passenger capacity was increased to 50 and a new factor, day trip passengers, makes its appearance in the yearly inspection reports in 1954. The licensed passenger capacity itself had been reduced in 1950 from 77 (of which 32 were berthed, the rest being second class and way passengers) to 50 divided equally between berthed and unberthed because of
the more stringent fire regulations. When the Klondike was converted into a cruise ship the inspection reports authorize the vessel to carry day excursion passengers, which in 1954, numbered 125 and was increased to 159 in 1955.

Operational History of Klondike II

The years 1937 - 1940 saw the Klondike put in a full schedule averaging approximately 15 trips per season. The year 1940 was the last year in which the Klondike performed at that level. In 1941 she made only 11 trips, and in 1942 she was not even launched.

The closing of Treadwell Yukon at Mayo in November 1941 due to a depletion of silver-lead reserves was probably a major factor in the reduction of river activity. The only bright light during the war years was the construction of the Alcan highway in 1942. Even this road was in essence completed by the military in 8 months, opening on Nov. 21, 1942, it took another two years for the Public Roads Administration using private contractors to bring the road up to specification.

During the war the Klondike spent a season on the lower river barging materials for road construction and the war effort. In 1943 the Klondike is noted to have put in a full schedule; however, the records stated she made only one trip on the upper river that season which leads one to suspect
that this must have been the year in which she sailed the lower river. Conditions for the Klondike seem to have degenerated during the rest of the war as she was only called on to make 3 trips in both 1944 and 1945. The termination of the war saw a marked increase in the work load that the Klondike was asked to perform, but only in comparison to what she had done in the latter years of the war for she made 10 and 9 trips in 1946 and 1947 respectively. The decrease in freight presented for shipment in the years subsequent to 1947 had a marked effect on the number of trips per season the Klondike made until she was converted into a cruise vessel in 1954. In 1948 she was launched in August to replace the Casca, and made only three trips before she was hauled out at the end of the season. In 1949 and 1950 she made five and seven trips respectively. In 1952 she made five trips but spent 1951 and 1953 on the skidways at Whitehorse. The only vessels to be launched in 1953 were the Whitehorse, which operated below Whitehorse, and the Tutshi, which operated on Lake Tagish, out of Carcross. The conversion to cruise service in 1954 also meant a regularized service for the Klondike and she made ten round trips to Dawson, a schedule that was also maintained in 1955. The last two seasons as a cruise vessel were, however, to be the Klondike's swan song as the poor economics of the venture simply could not keep her on the river.
The last trip of the Klondike in 1955, was very similar to the first, namely an excursion to Lake Laberge. However, instead of carrying a shakedown crew she carried some of the people of Whitehorse.40
The Techniques of Riverboat Operations

Winter Haul-up and Storage

Preparation for the shipping season could be said to have gotten underway when the ships were hauled out of the water in the fall. Note was made of all of the repairs to be made to the vessels and the materials required to effect these repairs were ordered so that they would be on hand the following spring. Such a policy was followed for all of the materials that would be required for the launch the following spring. One could therefore argue that an operational year for the riverboats began and terminated in the fall of the year and it will be treated as such in the following pages.

When the decision had been made to remove the riverboats from the river up onto the ways for the winter season, the procedure followed was rather simple but arduous. The skidways which were simply 12 to 14 inch square timbers that ran from the riverbank up onto the shore were located north of the present White Pass train station in Whitehorse. ¹ There were apparently two complete sets of ways which held both the riverboats and the barges that
could be stored at Whitehorse during the winter months. The riverboats were removed from the river in order of their size with the smallest being pulled out first and put at the top of the ways, and the largest last and toward the bottom or river side of the skidways. Barges were sometimes placed between the riverboats for fire protection so that if one ship caught fire the others would be sufficiently far away that they could probably be saved. The barges, as they were relatively cheap construction, were more expendable under such circumstances.\textsuperscript{2} The barges that were not used to separate the various ships were pulled up on the barge ways at the extreme north end of the shipyard. The above noted sequence of ship, barge, ship etc. on the ways was ideal, and was certainly not adhered to rigorously as circumstances such as the non use of certain ships during a particular season, or part thereof, would have thrown such a sequence by the way side.

The first order of business at the end of the season was to empty the vessel. The riverboat was therefore pulled up to the dock and most moveable objects were put in storage by the commissary. Such objects included bedsprings, tables, lifeboats and some of the larger items.\textsuperscript{3} The spars and booms were taken down and placed in the cargo hold. Even the ship's nameplate that was attached to the wheelhouse was removed and put in storage. Those objects that were stored in the commissary were placed in a
designated area or pen, with each ship having its own; but this did not mean that the ship would receive in the spring exactly what it had placed there in the fall for some of the better objects had a tendency to migrate mysteriously from pen to pen.4

After the fire had been pulled from the boiler and the system cooled down, the boiler and engines were prepared for winter storage. Besides draining the whole system little else was done to the boiler; no cover went on the smoke stack and no lime pan was placed in the boiler. The simple reason for this limited amount of preparation for the boiler was that Whitehorse experiences very little precipitation in the winter, which, combined with the continuous cold, made such precautions unnecessary.5 The engines, however, received more attention. All heads and cylinders were pulled, the cylinders oiled and the valves packed. All packing on the engines was slacked or taken right off.6 The precautions taken with the engines were the same as those taken with any ship placed in storage in other ports of the world.

When ready for haulout the vessel was pulled up along the ways and a certain sequence of operations was performed, the first of which was to loosen the hog chains. All the hog chains were loosened so that when the ship was on the ways none of the chains would be under tension. This was required because the bottom of the vessel would not
necessarily be flat after a few months in the water and, once out of the water the weight of the ship would force the hull down to meet the timbers of the ways, putting a much greater stress on the chains than they were designed to accommodate if the above slackening procedures were not followed. The extent to which the chains had to be backed off was not always known, and the lack of this knowledge was brought home quickly at times with the loud report of a snapping hog chain when the ship settled on the ways.  

After the hog chains were loosened, the haul-out cables, used to pull the ship onto the ways, were placed around the hull of the craft. On the Klondike these cables, or straps, were wrapped around the hull: one at the bow, two through the freight deck and one through the engine room. Each one of these cables consisted of five or six strands of three-quarter inch steel cable. On those boats where freight doors or other openings were not conveniently located, small sling doors were installed through which the cables could be threaded. The first step in getting the steel straps positioned was to thread three-eighth inch ropes around the hull in the positions mentioned above by walking them back from the bow with the ropes extending underneath the hull or, in a manner of speaking, keel hauling the ropes. Once these ropes were in place they were used to draw the heavier cables into position. After the main steel straps had been pulled
around the hull they were secured, and wood pads were placed between them and the hull in areas of major stress to prevent the cables from cutting into the hull once the hauling out began.12

While the steel straps were being positioned around the hull, the skidways were prepared for the process of hauling out. To this end, a lubricant, generally a heavy tallow grease, was liberally applied to the way, by the yard crew in order to reduce friction.13 Considering the weight that would pass along the timbers there was no such thing as too much lubricant for the ways, but there was a danger of too little which could cause excessive heat build up due to friction, and hence the possibility of fire.14 The ship itself did not sit directly upon the ways while being hauled out but rather on a series of butter boards or cradles, which were wooden sleeves that fit over the ways, and moved with the vessel as the latter was pulled up the skidways.15

Once all the preparations had been completed and the ship positioned at the bottom of the ways with the butter boards underneath ready to be engaged, the process of hauling out began. The cables that encircled the hull ran to a line of four capstans spaced at 50 foot intervals at the top of the ways.16 In 1937, the capstans in Whitehorse were steam operated. This was not the case at Carcross where the Tutshi was pulled out by horse-powered
capstans. It was essential that while the vessel was being hauled out that all the cables were pulled in unison, for if one was under more pressure that the others, the concentrated force of such a pull would result in heavy damage to the vessel.\textsuperscript{17}

Once the ship had been hauled up, it was necessary to secure her solidly on cribbing for the winter. The ship had, therefore, to be raised. This was effected by the use of jacks, the number of which was determined by the size of the vessel. In the case of the \textit{Whitehorse} or \textit{Casca} the number of jacks would probably run to about 50.\textsuperscript{18} The jacks were positioned by the yard crew and, once in place, were turned in unison as signalled by the yard foreman, by all available personnel. After each turn of the jacks or part thereof, the jacks would be checked, for, as with the cables used in hauling the ship out, any excessive pressure in one area could hole the hull.\textsuperscript{19} Once the vessel was lifted to the desired level, the cradles and cables were removed and the ship was levelled approximately 12-14 inches above the ways.\textsuperscript{20} After being levelled, cribbing was placed under the ship and she was then lowered onto it and the jacks were removed. Until the mid 1940s the jacks were manually operated and required two men per jack to turn them. In the 1940s the manual jacks were replaced by hydraulic ones (substantially) reducing the manpower requirements to raise and lower a vessel.
The closing of the river and the placing of the riverboats upon the skidways did not terminate all ship yard activities. Most if not all of the officers and men of the vessels would have been released and sent home by this time. Before their departure, however, the master pilot of each craft would have informed the yard foreman of possible weakened areas of the hull. Even without this information, the hull would have been inspected as the continuous contact of the hull with sand and gravel bars during the shipping season would have worn certain planks quite thin. The planking in the weakened areas would, in all probability be cut out at this time, and left open to allow the inside of the hull to dry out. For the same reason a plank was removed out the hull in the bow section.21 The number of planks taken out of each hull and other planks that might have to be removed in the spring were noted so that the quantity of lumber required would be known and be on hand the following spring when the following year's work season began.

Although relatively little snow falls in Whitehorse, a man was hired, at about 35 dollars a month, to prevent the snow from accumulating on the ships. Whether or not this same man was used to check the ships periodically is not known; however, such a person would probably have been engaged as the ships had no fire protection while in winter quarters and leaving the vessels unprotected would not have made sense.22
Spring Launch

In the spring two groups of men arrived in Whitehorse prior to the arrival of the general reverberant crews; the first group or bull gang arrived approximately two months before launching began. Most, if not all, of the men who came to work on the bull gang would stay either in the shipyard or go on the riverboats in various capacities when the actual season began. The bull gang helped the shipwrights and carpenters, the other company personnel who started work at this time, to remove the ice build up from beneath the riverboats, paint the paddle wheels and generally to do any work that had to be or could be done at that time of year.23

Ice build up was a serious problem that had to be dealt with before general maintenance and repair could proceed. The ice accumulation resulted from the rise in the river in the spring which forced both river ice and water under the ships where it froze. There was only one way to remove the ice and that was through the muscle power of the bull gang who used short picks, shovels, and generally anything that would dislodge the frozen mass beneath the vessels.24

Once the ice had been removed, the shipwrights and carpenters repaired the hulls. Most, if not all, of the planks that had to be replaced or repaired had already been identified and removed the previous fall. The shipwrights
generally worked in pairs, one pair being assigned to each vessel and members of the bull gang were summoned when needed. The materials that were used for the hull, as would be expected, were all first class as anything else would have put the craft in peril. Three inch thick planking was used. It was cut and bevelled for caulking and then steamed, at which point bull gang members would be called in to help secure the planks to the hull with spikes.

About three weeks prior to the start of the navigation season, the riverboat crews arrived in Whitehorse and were set to work completing preparations for launching. This included painting, some of which might have already been done by the yardcrew and interior maintenance of the vessels. The painting was supervised by two professional painters employed by the company who mixed all of the paint used on the riverboats. The crews were divided and given general areas of the ship to scrape and paint, with the exception of the bottom of the hull which was never painted.

Once the snow had melted the only fire protection available to the vessels was gone and danger or fear of fire was high. The ship yard crews were prohibited from smoking in the yard as it was feared that fire would rapidly spread throughout the whole ship yard. The vessels were, therefore, launched as quickly as possible to reduce losses in the eventuality that a fire did break out.
The launching of the vessels generally took three weeks. If all efforts were concentrated on one vessel, a vessel could be launched in about two days. Such a concentrated approach was not, however, followed, as the workmen's activities were spread over the whole yard and generally a ship was launched every three to four days.\(^{33}\)

The procedure that was followed to launch a vessel was similar to that used for haul out, except that there was no need for the hawsers and capstans. Each vessel was, of course, still on cribbing. The riverboats were, therefore, jacked up, and the cribbing removed.\(^{34}\) The order of launch would be the reverse of that followed in the haul out. In those cases where a decision had been made not to use one of the vessels for the upcoming season, this riverboat was lowered and then pulled forward or aft onto the next set of skidways so that vessels higher on the ways could be launched. Prior to the butter boards being positioned under the vessel, the ways were covered with an application of hot tallow, and, once this was cool, grease was applied over the tallow for additional lubrication. (Fish oil was tried at one time but the local dogs removed it just about as fast as it was applied.\(^{35}\)) The ship was then lowered onto the butter boards that sat over the ways and was secured there ready for launch. On hot days launching was done in the evening as a strong sun could melt the tallow with adverse effects.\(^{36}\)
The launch itself was relatively simple as gravity in conjunction with the greased ways carried the ship to the water. The skidways were so positioned that there were seven-eighths of an inch drop for every foot of the skidway near the top of the ways and this increased to a one and a quarter inch drop near the bottom. In the event that a little force was required to get the ship moving, a line, which could be brought into play for that purpose, was run across the river. This line was at water level and was a potential hazard to pontoon planes that used the river for take off or landing. As far as is known no accident ever happened with the line across the river; however, there appear to have been quite a few close calls. A line from the bow secured the vessel to shore once it hit the water and a barge positioned in the water just down stream of the launching position prevented any damage to the riverboat as she swung back into the shore after hitting the water.

Once in the water, the vessels were either pulled up to the loading docks or were brought there under their own power depending on the state of readiness of the boilers. The fires in the boilers were started with oil and small pieces of wood. While the boilers were being prepared, the hull was inspected for possible leaks beyond what would be expected prior to the natural expansion of the planking through water absorption.
Upon reaching the dock, the vessel was completely refitted with materials that had been stored in the commissary the previous fall. Each of the various ship's departments was responsible for its own section and for making sure everything was in its place and acquiring those things that had to be replaced or added. For example, the Chief Steward would ensure that linens, china and flatware etc. were acquired, while the first mate would pick up the running lights etc. The spars were set up, using the ships own power, and in general everything was readied for the season. This was also the time of year when each vessel scheduled to operate during the season was checked by a Department of Transport steamship inspector, who traveled from Vancouver to Whitehorse to carry out the annual inspection. The inspector examined the engines, boiler, fire-equipment, lifeboats, etc. to ensure that the vessel was safe and the mechanical systems were operating properly. Until the vessel was certified by the inspector, it could not be operated, and each vessel had to carry a certificate, displayed in a prominent place which testified to its worthiness.

On the River
Once the vessel had been loaded with freight at the dock at Whitehorse, preparations were made to get underway. Steam would be got up in the boiler and when working pressure was
reached the siphons would be engaged on the side of the ship away from the dock (almost invariably the port side) to empty the bilges. Notification of departure was a broadcast through the agency of the ship's whistle; 3 whistle blows indicating 30 minutes to departure, 2 whistles 15 minutes and 1 whistle 5 minutes. During this period the paddle wheel, which had been secured to prevent it being turned by the force of the current, was disengaged from its holding strap; the sailing orders were received from the office and the passengers were boarded. The purser was generally the last man to board, often as the lines were being let go, since he would check with the office to pick up any last minute messages or sailing orders.

Communication between the wheelhouse and engine room, or between the eyes and powerplant of the vessel, was extremely important, particularly when landing or departing, since the wheelhouse and engine room were located in different parts of the vessel. The **Klondike** was equipped with a telegraph system between the engine room and the wheelhouse as well as a bell system. On a control panel just aft of the wheel in the wheelhouse, and to which the hydraulic steering mechanism was also attached, there were three bell pulls. Two of these bell pulls were connected to bells in the engine room. The gong, or the larger of the two bells, was used to indicate direction, that is one gong for ahead and two for astern. The smaller bell, or
jingle, was used to designate the desired speed. The third bell pull was connected to the bell located above the freight doors on the forward bulkhead. This bell, called the jack knife bell, was used to relay instructions for handling a barge if the vessel were pushing one.46 There were two ways the master or pilot would know if his signals had been understood, either by the action of the vessel or through a voice communication tube.47 The bell system to the engine room seems to have been superseded or, more correctly, bypassed with the installation on an ad hoc basis of regular ship's telegraphs on all British Yukon Navigation Co. vessels. The telegraphs were apparently not new and were simply installed on the vessels as they became available. From all accounts, Klondike I appears to have been equipped with a telegraph system when she was launched in 1929, as was Klondike II in 1937; however, in 1938-39 the steamer Keno still functioned with a bell system. Even with the ship's telegraph in place a number of skippers did not use them, preferring the bells instead.48

Until the 1940s voice, as opposed to signal, communication was effected through a system of voice tubes.49 Two voice tubes were located in the wheelhouse. One of these served for direct communication with the engine room and the other to the foredeck. There were two tubes in the engine room, one from the wheelhouse and the other for communication with the boiler stokehold.
Each speaking tube had a whistle at each end which could be engaged by flipping it over the end of the tube and blowing into it. There were problems with the speaking tubes on the Klondike because the length and the natural flexibility of the vessel caused the tubes to break. For this reason a telephone system was introduced about 1945.50

The communication systems described above were adequate under normal circumstances. However, when the pilot or master needed full power immediately, they contacted the engine room by means of an emergency button which sounded an alarm in the engine room.51

The departure from Whitehorse was not a simple matter of moving away from the dock and pointing the bow downstream for the 36 hour sail to Dawson. Indeed some considerable manoeuvring was required since the bow of the vessel was pointing upstream and the river was relatively fast and narrow near the docks. The ship moved away from the dock, headed upstream a short distance to approximately the location of the Robert Campbell bridge across the Yukon River, at which point the bow was swung to port and the engines stopped. This manoeuvr allowed the force of the current to swing the bow around until it faced downstream and once that position was reached the paddles were again engaged to either direct the vessel to the shipyard to pick up a barge or to head downstream.52
The master or pilot steered the Klondike by means of a hydraulic tiller or lever that was connected by a set of cables to the rudders. The main steering wheel was also available for emergency situations such as when the hydraulic system broke down, as it was always connected. The lever extended out at a right angle from the control panel located aft of the main steering wheel, and in the absence of a helm indicator on board the Klondike could be used for that purpose. In this, the Klondike's helmsmen were more fortunate that those on other BYN vessels which were equipped with steam steering where the control lever had to be brought back to the center line after sufficient steam had been allowed into the system to set the rudders at the desired angles.

Once Whitehorse was out of sight the deck boy lowered all of the flags. There were three flag positions on the Klondike; the jackstaff up forward, the flagstaff on the wheel house and the flagstaff attached to the transom aft. Each of these flagstaffs carried a different flag. The jackstaff displayed the greatest variations in flags, depending on what was carried and where the ship was located. When mail was on board the Royal Mail pennant was flown from the jackstaff. A dynamite or gasoline load was indicated with a red flag, and the American flag would be flown when the vessel was travelling in Alaska or even in Canada when it was July 4th. The flagstaff on the wheel-
house always flew the British Yukon Navigation Company house flag. The aft flagstaff carried the Canadian flag which at this time was the Red Ensign. Generally speaking, the flags were displayed only when a vessel was coming into or leaving port.

The forward jackstaff was also used by the helmsman as a steering aid and to gauge distances and heights of land. The jackstaff was surmounted by a wind vane and the flag, when in place, indicated wind velocity. The direction and force of the winds were of prime importance to the helmsman as they affected his steering and indeed if the wind were too strong it could keep a vessel from sailing at all.

The downstream voyage was not simply a matter of aiming the bow in the same direction as the river until Dawson was reached, a lot of manoeuvring of the vessel and expertise on part of the helmsman were required. Only on Lake Laberge providing the ice was out of the lake and the wind conditions were such that no problems would be likely to arise, could the helmsman relax and possibly allow a passenger a turn at the wheel or lever. On the rest of the river controlling the vessel took skill and an intimate knowledge of the river.

Generally speaking, one of the smaller gas launches such as the Loon went down river early in the season and marked many of the channels because the navigation channel
on various stretches of the river changed from year to year. Nevertheless, the first riverboat trip of the season was the most difficult. The helmsman had to be able to read the water and, in those places where the channels had shifted, choose the one with the greatest quantity of water going through it, sounding the channel, where necessary and if possible, as the vessel proceeded through it. All the masters and pilots used steering marks located along the river - an orange crate nailed to a tree, a tree itself or a rock on the river bank. Such navigation aids were often marked by individual skippers or pilots. Some masters made a detailed chart of the whole river upon which all relevant information would be kept. While these charts had to be up-dated continuously because of changing river conditions they enabled the helmsman to set the craft in the proper attitude to meet a particular river condition. Other helmsmen, because such a detailed map of the river required a good deal of work to keep it up-dated, felt that it would be more trouble than it was worth and relied instead on memory and ability to read the water.

It is important to note that a sternwheeler is steered by means of rudders that are located at the extreme aft end of the vessel, and for this reason it is the attitude of the stern that dictates the direction of the craft, much as would be the case if a large truck was steered by means of the rear rather than the front wheels.
Of all the manoeuvres performed by a riverboat, one of the most difficult was that of negotiating a tight bend on the downstream run. As the steamer approached the bend the order was given to stop the paddle wheel and then to put it into reverse. The vessel was so positioned that the force of the current would hit either port or starboard side of the vessel depending on whether it was a right or left hand turn. This had the effect of pointing the stern into the shore and with the vessel in that position the force of the water would carry the vessel around the bend. Once the boat had cleared or been positioned for the next manoeuver the order was given for full speed ahead. This manoeuver was termed drifting a bend. In drifting a bend on the downstream run, or "steering a bend" as it was called on the upstream run, considerable attention had to be given to the stern as it pointed in towards the shore in order to prevent beaching either the wheel or the hull.

One aspect of the Klondike's hull design that made it easier to take her around a bend was the fact that she had square knuckles. The knuckle is that area of the hull where the side meets the bottom. Having a hull design where the side meets the bottom at a right angle instead of being curved meant that when the Klondike went around a bend the water on the side of the vessel heading toward shore was being banked, thereby acting as a cushion, whereas a curved hull could have slid over the water toward the shore.
Under normal conditions on a straight stretch of water the maximum efficiency of the Klondike's paddlewheel was reached at 22 revolutions a minute. Although the wheel could be rotated up to 28 rpm, anything faster than 22 rpm did not allow sufficient time for the water to recover with the result that the paddlewheel buckets ended up pushing more air than water.65

Obstructions to Navigation

The round trip (some 920 miles) between Whitehorse and Dawson, including lay-over time in both ports, took approximately seven days. One and a half days were allotted to the downstream voyage and four and a half days for the upstream segment. The speed of the river current on the downstream run was largely responsible for the faster Whitehorse-Dawson passage. The effect of the current had advantages and disadvantages. The increased speed on the downriver run meant that the helmsman had to be on his toes at almost all times. Any laxness or inexperience on his part could result in the vessel being grounded on a bar or holed and sunk, as happened to the Klondike I. Indeed on the downstream trip, it was frequently necessary to moderate the effects of the current particularly on tight sections of the river, by reversing the engines. The upriver run allowed the helmsman much greater time to relax as the craft's speed, which was almost half of that on the
downriver run, allowed plenty of time to set up the vessel for any manoeuver and to pick a channel that seemed promising in those areas of the river that were shallow. The speed of the current, however, was at times greater than that which could be handled by the vessel's engines on the south bound or upstream journey, and at such places recourse had to be taken to help the vessel through with lines anchored there for such purposes.

The principal obstacles to navigation on the river between Whitehorse and Dawson were Five Finger rapids, Rink rapids, Hells Gate, Domville Bar and U.S. Bend. On these sections lines were provided to help the vessels through. Each line consisted of a one inch diameter steel cable which was anchored at both ends of the trouble spot and which was had a sufficient amount of slack in it to enable it to be picked up and wrapped around the steam winch on a vessel's foredeck. There were difficulties with some of the lines, for their continued use resulted in kinks. Such kinks could cause the line to jump off of the winch drum or pull a man overboard if he got hung up in one of them. The line was picked up at the beginning of the run with a pike pole and was thrown overboard once through the trouble spot. Lining was generally resorted to only on the upstream trip although the master might use the line to maintain a certain course through the trouble spot if he thought it desirable on the downstream run. Occasionally a
riverboat might be taken through one of the rapids without the aid of a line such as at Domville Bar, Thirty Mile and U.S. Bend where the line was used more to hold the vessel in place or to guide it through than because of the swiftness of the water, although the vessels were almost invariably lined through Five Fingers and Rink Rapids on the upstream trip.\textsuperscript{69}

In lining up, the focus of attention was the bow where the winch was located. As the process was performed every trip the bow had to be kept relatively clear near the winch, especially during the upstream run.\textsuperscript{70} The Klondike's winch was described by the crew as "old and cranky", and because the steam was exhausted directly into the atmosphere, it created problems with visibility.\textsuperscript{71}

Five Finger Rapids was certainly the most exciting and possibly the most difficult section on the river to traverse. For years this section was blasted to make a larger and more navigable channel. On the downstream run, vessels went through at 17-18 mph without the use of the cable. As soon as the vessel was through the rapids it had to go straight across the river in order to avoid a submerged rock just below the Fingers, and in the process swing its stern close to the rock cliffs.\textsuperscript{72} The speed at which a vessel sped through the Fingers presented a constant danger to the ship's housing, and one riverboat, the Aksala, lost part of her housework after hitting the
face of the rock. On the upstream run it was possible to steam through the Fingers without the line if the vessel had enough power to do so. Under the right conditions the Klondike had enough power but the cable was generally used. According to one of the Klondike's masters,

The idea of the cable is not the swiftness of the water but all the rocks across here. The Fingers, [which were a series of large rock outcroppings] darn that water...

The boat goes up so far, it gets over this hump [caused by the damming of the water] and then she tips and lifts its wheel pretty near out of the water and you haven't got a grip on the water to push you, so consequently you have to get cable and take you over the hump.

The line was picked up near a bluff, which was the only place on the river where tires were hung for protection of the vessel, and the line was dropped off approximately 1500 feet up river. The whole operation lasted no more than half an hour.

Attempts were made throughout the years that the riverboats operated to clear some of the more difficult areas of the river. A new channel was blasted through Five Fingers. Some of the larger obstructions in other parts of the river were also blasted away. All of this work was performed by riverboat crews in the spring of the year when
the water was at its lowest. These crews were generally made up of men who wanted a more intimate knowledge of the river and such excursions allowed them to study such areas as Five Fingers in great detail. The crews that were sent out for the blasting also placed gauges at the more dangerous areas so that during the season the helmsman would have an idea of how much water was available, which dictated whether or not they could go over or would have to go around a certain obstruction.\textsuperscript{77} For a number of years the cost of these river improvements was born by the company; however, the federal government did provide funds for the clearing of dead falls, slides and rock obstructions.\textsuperscript{78}

The greatest fear of a vessel's crew, apart from being sunk, was grounding as this might entail long hours of back breaking work before the vessel could be freed. Fortunately, grounding does not appear to have been all that common. W. Bromley, a former master of the Klondike, only remembers the Klondike grounding three times.\textsuperscript{79}

With the exception of Dawson, Whitehorse, Stewart Landing and Selkirk landing facilities were non existent which meant that the danger of grounding when coming into shore on other parts of the river was always present. For the most part the vessel simply nosed its way as close as possible into shore, sounding as it did. A narrow run off board would be shot ashore when the vessel was close enough over which the purser would travel to deliver the mail. If
freight was to be loaded or off-loaded or fuel to be taken on, the vessel was secured so that the main gang planks could be placed. Unscheduled or unplanned stops would only be made if the vessel were flagged down.80

One area of the river where more than one vessel grounded in the years of riverboat operation and where special precautions had to be taken was the Flats. The Flats were located at the head of Lake Laberge where large quantities of silt were deposited by the fast flowing river as it debouched into the lake with the result that the channels through this area did not remain constant. One of the company's smaller work boats, such as the Loon, was sent out every spring to chart the best channel through the Flats, marking its course with empty 50 gallon fuel drums held in position by anchors.81 This was the only place on the river where a marker light was used, it being placed on the lake side of the channel directing those vessels traversing the lake to the beginning of the channel. At times the channel was quite shallow because of fluctuating water levels, and the vessels taking this into account, generally backed across the Flats dragging a chain to prevent the bow from swinging. Less water was required when a vessel backed across the Flats since the wheel was pushing the water under the hull, whereas, when it pushed the vessel the action of the wheel took water from under the hull.82
One of the reasons why a vessel did not ground as often as one might expect was the if there was any uncertainty about the depth of the water, the river was, where possible, sounded as the vessel proceeded. This entailed positioning a man on each side of the foredeck or, if a barge was being pushed, on each side of the barge at its forward end. The sounder would call out three, half three, four and so on depending on the depth of the water. The sounding poles originally had alternative black and white stripes. Poles with black, white and red stripes were introduced sometime during the latter 1930s for easier reading of the poles. Soundings were most generally taken when the vessel was coming into a landing or going across the flats.83

There was only one danger with sounding: if the man placed his pole too close to the hull, he might get an unexpected dunking.84

There were four ways of getting a vessel off a bar or shallows: washing the sand or gravel away with the action of the paddlewheel; unloading cargo to lighten the draft of the boat; running a line to a secure stationary object and lastly sparring. Whichever method was selected depended upon the feasibility and the amount of work and time involved. For example, if a boat grounded near the stern, the wash from the paddlewheel might remove the obstruction. If it grounded near the bow, using the paddlewheel would be a waste of time. If unloading the cargo or a portion
thereof would take more time than running a line or sparring, one of the latter would be tried first if it promised sufficient effectiveness to make the attempt worthwhile.

Of the several techniques available, the most spectacular was probably sparring. The spars consisted of two, large, mast-like timbers equipped with block and tackle. Each spar had a metal collar around the bottom. When the spars were not in use they were lashed to the forward housing, one on each side of the main mast. When required, the spars would be lifted from their seats on the foredeck and placed over the side of the vessel through a metal chain collar attached to the hull to the river bed below. The spars were angled depending on the way the vessel was to be moved; both spars were used if the vessel was to be moved forward or aft and only one if it was to move sideways, with the side of spar placement being determined by the direction the vessel was to move. If it were decided to move the vessel forward, both spars would be set and angled backward with the lift being obtained through the blocks and tackle that extended down and to the winch. Once the winch was engaged the vessel would be raised at the bow, with the paddle wheel providing the forward momentum. The vessel would jump forward about 3 or 4 feet in such a manoeuver, after which the spars would have to be reset again for the next jump forward. The operation of
sparring was both arduous and time consuming and at times necessitated 36 hours of continuous work by all those on board.

If the river bottom was too soft to support the spars a line would have to be secured on shore and the vessel pulled off with its help. This operation could be more difficult than it sounds for a secure anchor such as cotton wood tree or a series of trees if one was not adequate might be quite a distance away. At times it might be necessary to use the full 10,000 feet of cable the vessel carried, although in such cases it might be easier to place a deadman. When all was in readiness the winch was engaged. If the cables snapped they would have to be spliced with a consequent loss of time.

Getting the vessel off a bar could consume a major portion of fuel, necessitating a wooding up operation by an already exhausted crew very shortly after the vessel was freed.

There was one obstruction for which there were no preventative measures and for the crew no physical labour involved. A herd of cariboo could plug the river solidly for hours at a time at the migratory crossing points. The only recourse the helmsman had was to proceed as slowly as possible hoping to push his way through or, if a break occurred, gather up a full head of steam and depart from that location as quickly as possible.
Damage, Repairs, Prevention and Safeguards

The sinking of the Casca and Klondike I in 1936 underscores the fact that there always was a danger of holing if not losing a vessel, particularly on the upper river.92

The holing of a riverboat did not necessarily result in the loss or sinking of the vessel, as temporary repairs could be effected before the situation became irreversible. Leakage in the hull, whether minor or major, was not always due to sudden encounters with rocks or snags, but was also caused by the weakening of the planking through contact with gravel and sand bars. These bars had a sand paper-like action on the wooden hull so that by the end of the season some of the riverboat hulls might be extremely thin. The wearing of the planking might make the damage of a sudden sharp encounter more extensive with the loss of not only a few boards but possibly a few frames.93 To repair holes or leaks while under way, "soft patches" were included in the ship's stores. The "soft patches" were simply precaulked sections of planking that fit directly between the frames in the hull. These patches were stored within easy reach in the hull. If the hull were breached or leakage developed, the pumps would be immediately engaged and a hole 6 inches by 8 feet could probably be plugged from the inside in a matter of five minutes.94 Once installed, the soft patches were generally left in place for the rest of the season.95
Rudders and paddlewheels were the two items most vulnerable to routine damage on a sternwheeler. These appendages, seen from a structural standpoint, were the most fragile as they were not very well braced in comparison to the hull. The rudders, especially the rudders aft of the paddle wheel (called monkey rudders) were moved up or down depending on river conditions and load, and hence could extend below the wheel thereby increasing their vulnerability. In drifting a bend the wheel came dangerously close to the shore and at times made contact with it which could quite easily see the sudden elimination of several paddle buckets. Backing over a shallow section of the river meant that the rudders and wheel would be the first to encounter any obstructions. These are but a few causes of the damage that could carry away a rudder or paddle bucket. Such damage was, furthermore, not necessarily restricted to only one of these structures as the loss of all rudders and a number of paddlewheel buckets at the same time did occasionally occur. Most vessels were prepared for such emergencies and carried two spare rudders, besides having in stock all materials necessary to construct additional rudders and paddle buckets in case the spare ones were not enough.

Fire was an ever-present danger on these vessels because of the wood and canvas used to obtain lightness in construction and the use of wood as a fuel source.
Depending on the type of wood being burned for fuel, the fireman firing, or the power required at any one time, the size of the burning embers emanating from the stack could vary in size from inconsequential sparks that extinguished fairly quickly to flaming nodules that were spewed all over the ship's deck boy's duties. As a consequence one of the decks was to maintain a continual vigilance for burning embers. Some of the riverboats were more susceptible to this dangerous condition than others. As one former officer recalled:

"The old Nasutlin, when she burned wood, you'd need an umbrella to go from the wheelhouse downstairs. I've still got an old coat at home where there's a hole as big as a 50 cent piece."  

Not all embers were extinguished before they could do any damage and a visual inspection of some of the period deck canvas on the S.S. Tutshi at Carcross, shows that the canvas covering the deck took the worst beating. The holes that were burnt through the canvas had to be repaired giving certain, especially abused, areas of the deck an almost patchwork quilt appearance. The damage caused by these burning embers appears also to have been one of the reasons for the replacement in the late 1930s of the canvas life boat covers with galvanized metal ones.
The flammability of the painted canvas on the decks and lifeboats required every possible precaution from the hosing down of the deck by the deck boy to the presence of fire control systems. A number of soda acid fire extinguishers were located within easy reach throughout the ship, from the wheelhouse down to the freight deck. Fire buckets in racks were located on every exterior deck except the fore-deck; the buckets contained water and sand in the proportion of four or five to one. Most of these buckets were round bottomed to prevent them from being used for other functions; however, flat bottomed buckets were also used. The number and location of fire extinguishers, fire buckets and fire axes, a number of which were also located throughout the ship, varied from year to year depending upon the views of the steamship inspector. Fire water barrels may also have been located in various parts of the ship. These were generally converted oil barrels, and were probably located on the freight deck. On the Klondike and also on the other vessels, drinking water barrels were located on the saloon and boat decks and it is likely that these could quite readily have been put into service if the need arose. The main fire suppression system on board consisted of the fire hydrant risers located on various deck levels. The Klondike originally had four fire hydrant risers: one on the boat deck forward of the cabins, and three on the saloon deck, one of which was located
forward of the saloon, one on the starboard side, and one aft of the saloon deck housing. Fire hoses were always hooked up to the hydrants except when the deck boy was watering down the decks, at which time an ordinary garden hose was attached. The passengers were of course apprised of the danger of fire and fire drills were routine during a trip.103

In the event that a fire made it necessary to abandon ship recourse was had to the lifeboats of which the Klondike carried four. Because the Klondike was restricted by law to minor inland waters the provisions carried by the lifeboats were minimal. Even on the largest body of water that vessels had to cross, namely Lake Laberge, the shoreline was not very far off and since the object was to get everyone ashore, rather than remain in the lifeboats, it was assumed that a lifeboat could do double or triple duty. Lifeboats were provisioned with small hatchets to cut the lifeboat falls if for some reason they could not be released. Small tin bailers were kept in the lifeboats. These bailers came in handy during the sinking of the Klondike in 1936, because the drainage plugs in the boat had not been inserted and the boats shipped water. A tiller and oars were kept in the lifeboats as would be expected. The only other item in the lifeboat was a tin of matches, taped shut to keep the inside dry so that a fire could be started once shore was reached while the passengers and crew awaited a rescue vessel.
Prolonging the Navigation Season

Various attempts were made to extend the length of the short navigation season during the steamboat era.

The main obstacle to an early start to the navigation season was Lake Laberge where the ice broke up later than anywhere else. The Marsh Lake dam was built above Whitehorse in the 1920s so that the level of Lake Laberge could be raised in the spring to speed the breakup of ice. Another method whereby the lake was made navigable at an earlier date was to spread a mixture of lamp black and old crank case oil across the lake near the shore. By absorbing the heat of the sun the lamp black caused the ice directly below it to decay at a quicker rate. Once it was determined that the ice below the lamp black had deteriorated sufficiently, a vessel such as the Whitehorse, pushing a steel hulled barge, would try to break a passage through the ice. The lamp black was not always efficient, as success depended on sunny days, and any snow that fell after the mixture had been spread reduced the effectiveness of the lamp black. Once a path had been cleared along the shore with the help of lamp black, there was always the danger that the pack ice on the lake would shift in towards the shore and crush a vessel attempting to cross the lake.105

The river was cleared of ice two or three weeks prior to Lake Laberge and hence shipping in that portion of the
river could theoretically start then. Fortunately, there was a slough located at the lower end of the lake where a riverboat could be anchored during the winter months, and so be ready to take advantage of the open river once the ice had cleared. A man was stationed in a cabin near the vessel during the winter months to keep off trespassers and to clear the snow off the vessel. He was not totally isolated as there was a telegraph operator and his family a few hundred yards away and Whitehorse was accessible once the ice had formed on the lake. Because the water in the main river was at its lowest point of the season after the ice went out, the company would winter one of the shallower draft vessels such as the Keno or the Aksala at the slough. Refitting and loading the vessel that was placed in the slough took place in the spring with all of the material being transported over the ice of the lake. This vessel was used to start bringing ore down the Stewart River to Stewart Landing so that the ore would be in readiness for shipment upriver once the regular shipping season started.

The final weeks of the navigation season which generally ended in the middle of October, were marked by an effort to get communities below Whitehorse supplied with winter provisions, to move any ore stockpiled at Stewart Landing to the railhead, to handle the exodus of seasonal mine labourers and get the vessels into winter quarters.
before the river froze in. By the middle of September the average minimum daily temperature fell below the freezing point, causing the spray thrown up by the paddle wheel to freeze on the wheel and the aft end of the vessel. This encrustation of ice reduced the efficiency of the paddle wheel and, at such times, the steam hoses would have to be got out and the ice removed before the vessel could continue. The imminence of freeze up generally meant that the last voyage was made under unfavourable conditions and to make sure that no time was lost, extra crew was carried so that freight and fuel handling could be done as quickly as possible.

Although the season of navigation on the Stewart River was, in a sense, the same as the main river, it was a much shallower river necessitating for most of the season, shallow draught vessels such as the Keno. When that river was especially high in the early part of the season, some of the larger ships were put on that run to get as much freight up and down that river as possible. In 1949 the Stewart River was of sufficient depth for the Klondike to be used on it, transporting ore to Carmacks and coal back up to Mayo.

Night-time Travel

Night time travel only becomes a factor on the Yukon River in the spring and fall of the year for the extended daylight
hours in the summer meant a very short period of darkness. Most old timers on the river, that is the older ship's masters, had a tendency to tie up when it got dark, especially on the more dangerous downstream run, and in particular the stretch known as Thirty Mile. There were, of course, other times when the vessel was tied up automatically, such as periods of heavy fog or especially bad weather. The younger pilots and masters such as W. Bromley, found night time travel more of a challenge and did not hesitate to do so; using all of the available equipment on board, such as the search lights, intended for that purpose.

In any type of night time operation it is visually more effective to look from darkness into darkness or from darkness into an illuminated area rather than the reverse. For this reason the wheelhouse was not lit at night and steps were taken to ensure that none of the lights aboard ship cast light or reflections in front of the vessel. All forward cabins had blinds which had to be drawn if lights were used, and the observation room was originally equipped with an outside blackout canvas attached above the windows that was lowered each evening and raised each morning by the deck boy. This blackout canvas may eventually have been replaced with heavy, green coloured black-out curtains in the observation room, for in later years the canvas is not visible in photographs. A pilot could in all
probability have operated the vessel in darkness across Lake Laberge, especially when heading for the Fairway buoy light. There were no other navigation lights along the river to assist him in steering his course. However, pilots and masters placed white painted markers at strategic points along the way that could be picked out with the search light. The main search light had a 1000 watt bulb at the focus of a parabolic reflector which was encased in a moveable housing that was an attached to the forward edge of the boat deck. There was an additional search light on the wheelhouse roof which could be rotated 360 degrees and hence used to back out of a slough or the like at night. The ability to navigate the river at night meant a virtual round the clock operation throughout most of the navigation season.

Freight Handling
The raison d'être for the Klondike's existence was the movement of freight. Without the large quantities of freight presented each year for shipment, the number and size of the vessels that plied the Yukon River would have been substantially reduced.

The south bound or up river freight was generally more consistent that the down bound freight because the majority of it consisted of ore concentrate. The ore was not, however, loaded at Dawson but at Stewart Landing
approximately 70 miles up river. The amount of cargo, such as passenger baggage, originating in Dawson was generally small and was loaded amidship so that when Stewart Landing was reached it would not get in the way of loading the ore concentrate."

Whenever possible vessels on the Yukon River tried to reach Stewart Landing at the same time as the Keno was due to arrive from Mayo so that a direct transfer of the ore could take place. A direct transfer would take possibly two to three hours less time than if the load were taken off the shore. If the Keno were pushing a barge, the loading of the Klondike could take three to four hours, with the ore being taken on through the midship freight doors rather than the bow because of the deck height differential between the Klondike and the smaller Keno and its barge.

Placement of the ore sacks on the vessel by the deck crew started at the forward end of the freight compartment. The ore sacks were placed five high in that area, eventually reducing to a level of two or even one high when the final sacks were stowed toward the aft end of the freight deck. Twelve people were involved in loading the ore, six truckers and six stackers. The hand trucks each carried three sacks which were manhandled off and on the trucks by two stackers. The sacks weighed 125 pounds each; there were 16 sacks to the ton. If river conditions allowed an extra heavy load, several rows of ore sacks would be placed on the bow at
times four to five high, and even in the area along the boiler; however, access to the valves located along the boiler had to be kept free at all times.\textsuperscript{118}

At Whitehorse, the ore sacks were off-loaded through the forward starboard side freight door of the Klondike onto skiffs. The skiffs were then moved by cranes from the docks to the train yard where they were loaded into freight cars for the trip to Shagway.\textsuperscript{119}

The time in Whitehorse allotted for the Klondike to unload its 300 tons or so of ore and to put on a full load of freight for the downstream run was twelve hours. This was half the time allotted for what was probably less work at the other terminus of the run, Dawson. The reason for this was probably that there was less man power available at Dawson, and because the facilities there were also used to wash boilers which would have tied up limited dock space in Whitehorse necessary to unload the valuable incoming ore from Stewart River landing.\textsuperscript{120}

Since the Klondike had only 12 hours turn around time at Whitehorse, the north bound cargo was loaded as soon as the unloading of the ore had been completed.\textsuperscript{121} If one were obtaining freight from the far end of the warehouse and carting this to the aft end of the vessel's freight deck by way of the vessel's bow (the Klondike was loaded from the bow), the total distance walked could easily add up to over 600 feet for one delivery. Doubling the above figure for
one complete trip and multiplying that by the number of trips one individual would have to walk to help load the Klondike's 200-250 tons of general freight gives an indication of the physical state of the crew once the vessel was loaded and ready to leave at five o'clock. Even with the assistance of longshoremen at Whitehorse, the deck crew of the Klondike had little if any opportunity to enjoy the sights and sounds of that community during their brief stay there. \(^{123}\)

The removal of the ore was relatively simple and needed little supervision; however, loading the downriver freight required close guidance by the ship's mates. Way-freight bills were obtained from the purser to find out the total size and type of load to be taken on. \(^{124}\) Placement of freight depended, to some extent, on destination as all cargo consigned to a particular recipient was generally kept together. As all cargo was marked according to destination, it was relatively easy to keep the various consignments separated; particularly small consignments were demarcated from adjacent cargo by dunnage boards stood on end. \(^{125}\) The major concern of the mate as far as cargo placement was concerned was the trim of the vessel and hence the weights of the various consignments being carried had to be known. The vessel was loaded so that she was down by the head, and this was generally checked by the vessel's master. If the vessel were found to be out of trim once she was loaded and
underway the problem was rectified by either moving freight or burning wood from the side that was down too far.\textsuperscript{126}

Although downriver cargo varied from trip to trip, there were certain general rules to be followed concerning cargo placement. Freight was placed on dunnage boards along the outboard bulkheads, and extended from the bulkheads into the freight deck area to the first set of fore and aft stanchions.\textsuperscript{127} An isle of six to seven feet separated the material stacked along the bulkhead from that placed aft of the boilers\textsuperscript{128} and a clear space extending approximately 12-15 feet aft of the boilers was maintained to allow for cleaning of the fire tubes.\textsuperscript{129} All of the open space on the freight deck was not used as the cargo extended aft to within 20 feet of the aft bulkhead, thereby leaving a corridor between the aft freight doors.\textsuperscript{130} Placement of the cargo in those areas designated above also varied in the sense that it could extend from deck to deckhead at the forward end of the vessel, to three feet high aft depending on cargo weight and type. The reason for this, as has already been stated, was to keep the head down, which also dictated the fact that most of the heavy cargo went near the forward end of the freight deck and the lighter material aft.\textsuperscript{131} Whether or not the cargo did extend to the deckhead at the forward end also depended upon the type of cargo carried, for it would have been difficult to stack or unstack 45 gallon drums manually beyond two
As the loading procedure did not vary that much, the general lay-out to be followed for cargo placement became well known to the deck crew, and at the beginning of the season the deck crew was divided into two groups with each responsible for one side of the vessel.

One of the most important classes of freight was foodstuffs, most of which, except for meat and other perishables, travelled well without special precautions, except for meat and other perishables. Meat came into the Yukon frozen and was kept in that state on the down river trip to Dawson. Tarpaulins were put down on the freight deck at the center freight doors on each side of the vessel and the frozen meat, interspersed with dry ice, was placed on top of the tarpaulins to a maximum load of approximately 7 tons per side. The two piles of meat and dry ice were then completely covered with several layers of tarpaulins. Other perishables such as eggs, butter, lard, and vegetables were stowed close to the outboard bulkhead, suitably removed from the heat of the boiler. All perishable freight, once the destination had been reached, was unloaded directly after the mail, which was usually the first freight off the vessel.

Although livestock was carried infrequently, it also required special handling. Generally some hay was spread out on the deck and portable pens erected. These pens were probably constructed with dunnage boards and were
secured to the outboard bulkhead somewhere near the aft freight doors. There was, of course, the inevitable liquor load carried which, besides being transported throughout the season, was also one of the last major loads to go to Dawson, to tide those residents over the long winter months.

If dynamite or gasoline were carried, passengers could not be. Similarly, when pushing a barge loaded with empty gas drums no passengers could be carried because the mixture of gas fumes and air in the drums was potentially explosive. Such drums if they had been steamed out would, at times, be carried when passengers were on board; however, even this was contrary to government regulation. Barrels containing either diesel oil or coal oil had no such restrictions associated with them and could be carried at any time. Paying passengers could get around the prohibition of passengers on a gasoline or dynamite run if they signed on, simply as a formality, as part of the crew, thereby absolving the company of all responsibility if something should go wrong.

In addition to cargo, the ship's stores were loaded at Whitehorse. These ranged from victuals, laundry and coal for the galley to lub oil and supplies for the engine room, all of which also had to be taken care of and stored on board prior to departure.
The White Pass and Yukon Route had the mail contract for many years and although not weighing very much, the mail could take up a lot of freight space. All first class and registered mail as well as express bound for Dawson were stored in a locker on the freight deck. When the quantity of mail exceeded the capacity of the locker it was piled with the rest of the mail on the freight deck. There was one requirement concerning the mail that made accessibility mandatory, and that was that when the vessel landed it was the first freight to be unloaded.\textsuperscript{145}

The purser was responsible for looking after the way mail, if the mail was addressed to people living along the river. One of the first things a purser did after distributing the landing list was to sort the way mail into the pigeon holes provided in his office, for the first mail drop was Upper Laberge which was reached shortly after leaving Whitehorse. Any way mail picked up long the river for delivery further along the route was put into its appropriate slot in his office, which the purser would check automatically before going ashore at that particular stop.\textsuperscript{146}

One method of delivering way mail was to weight it and tie it up, and when the vessel got near enough to the shore the package would be heaved to the recipient. The method sounds fine in theory; however, the package occasionally came undone and led to rather wet reading.\textsuperscript{147}
Barging played an important role in the movement of freight and later silver lead ore on the Yukon and Stewart Rivers. In contrast to a riverboat, a barge was generally loaded so that the stern was down. Each barge had a recess in its stern into which a punching post, attached to the stem of a steamboat engaged in tow duty, would fit. Both sides of the punching post were coated with either soft soap or waterproof grease to reduce friction. The barge was secured to the vessel by means of cross lines made of two inch manila rope, tackles and a preventor cable to either side of the barge. This hook-up allowed the barge to be jack-knifed around a bend through slackening one cross line and tightening the other by using the power of the winch, the preventor cables dictating the limit of the jack-knifing action. The skipper dictated the manner in which the barge was to be handled by using the jack-knife bell. Three bells advised the mate to stand by, two bells indicated that the barge was to be swung to port, one bell to starboard and also to stop.

In essence the Yukon barge was a floating rectangular platform whose construction (except for the stem and transom) was almost identical to a riverboat hull. The larger barges even had post and chain arrangements to prevent hogging. These barges were unpowered and did not have superstructures. To purge bilge waters from the barge, a siphon, which obtained its steam supply from pipes
connected to the winch on the foredeck of a riverboat, was hooked up. This precautionary siphon was used because the hull of a wooden barge was susceptible as the riverboat to damage and leakage. In later years steel barges were used with the holds becoming cargo carriers for such things as fuel which was piped directly in and out of them instead of being carried on deck in barrels.\footnote{152}

Notwithstanding the fact that the Klondike was built to eliminate the need for barging, combining as she did the load capacity of a vessel and barge, the Klondike did push barges when required. When large quantities of ore had to be moved, or at the end of season when large numbers of empty gas drums had to be carried to Whitehorse, to cite only two examples, the Klondike was pressed into tow service. In 1943 during the Second World War, when the Klondike was placed on the Dawson-Circle City run, she was particularly active as a barge pusher; indeed it was her ability to push two or three barges at one time that made her a logical choice for this service.\footnote{153}

**Fuel and Water Supply**

The procurement of wood fuel for the vessels was handled on a contract basis. The company employed a wood agent who let contracts, which varied from 300 to 2000 cords, to various woodcuters and who made sure that the contracts were fulfilled and that the wood was located in accessible areas by the time the season started\footnote{154}
The wood lot operators appear to have been men who enjoyed solitude and isolation. Most of them spent the whole year on their timber limits, perhaps going into Whitehorse or Dawson once annually. During the cutting season some of the woodlot operators hired Indians to work for them particularly if they had a large contract. The majority of them were single whitemen who lived in cabins near their operations although two girls, Anna and Marion Horsfall from Minto, decided to briefly enter this occupation, apparently cutting 25 cords of wood near Five Fingers Rapids one year to obtain some pocket money.

Whenever an area was cut over, that is when the wood was too far from the river to be transported economically to the river bank, wood lot operators moved their whole operation, generally consisting of personal belongings, cutting tools and horses, to a new location along the river. Movements such as this appear to have become more difficult as the years progressed, and the distance from the river to an accessible supply of wood became greater. By 1947 wood had to be transported to the riverbank from interior wood camps, which necessitated the added expense of bulldozing roads.

Wood lots generally were separated from each other by 50 to 100 miles. There were no substantial wood lots near of Dawson or Whitehorse. The first lot out of Dawson was 20 or so miles upstream, and the first wood stop downstream
from Whitehorse was 27 miles away at lower Laberge.\textsuperscript{158} Woodlot locations were determined by the fuel consumption patterns of the vessels and by accessibility. Bank height and water depth had to be taken into account in choosing a woodlot since it was desirable that the gangplanks not be so steep as to pose a hazard for loading. The angle of the gangplanks had to be such that the wood carts could be used safely; however, such was not always the case with some unfortunate results. If a woodlot were deemed to be in an inaccessible place, it was not unusual for a whole woodlot to be moved to a better location.

Fuel stops for the vessels were easier on the Canadian stretch of the Yukon River than the American section.\textsuperscript{159} On the former wood piles were parallel to the river as the banks were of a sufficient height that any rise in the level of river water seldom exceeded the bank height. The distance travelled by the deck hands in loading fuel was thus relatively short since the boat could land close to the pile. On the Alaska section or lower river, however, where flooding was always a danger, the wood piles were placed at right angles to the shorelines, and the deck hands had much further to go to get to the pile especially towards the end of the season.\textsuperscript{160}

The decision as to the quantity of wood to be loaded and the wood pile at which this would take place was that of the master of the vessel. The quantity of wood was dictated
by the amount of freight already on board; prevailing river conditions; the quality of wood at a particular wood pile - if a wood pile was known to contain only green wood it would, where possible, be avoided; and the rate of fuel consumption - Klondike II on a round trip averaged approximately one cord of wood per hour, whereas the Klondike I was slightly more economical and burned approximately 0.9 cords of wood on a return trip.\(^{161}\) If there was little or no freight on board and none was expected the skipper might decide to load 40 cords so that no further stops would have to be made before port was reached. Under normal circumstances the wood taken on tended to vary from 10 to 20 cords,\(^{162}\) and the vessel generally made two fuel stops on the downriver run and five to seven fuel stops on the upriver run.

Once the wood pile was reached the first man ashore was generally the purser. The purser had a cord measuring stick and a large piece of chalk with which he would measure out the amount of wood to be taken on. Once this procedure was finished the deck hands, who by this time generally had the main gangplank(s) in place, got busy loading the wood. The amount of wood taken was registered on a wood voucher that was signed by both the purser and the master and a copy of this was given to the wood lot operator if present or left in his mail drop if not. The other copy of the voucher was taken to Whitehorse where the quantity of wood would be
registered against the operator's name.163 If a fuel stop was to be made late at night or the purser was otherwise engaged he might arrange with one of the mates to handle the measuring and the paperwork.

The Klondike's main gangplanks each ran to a length of approximately 30 feet, yet even with such a span two gangplanks had a times to be joined so that the bank could be reached. When two gangplanks were joined, they were supported from below by a sawhorse type of affair, of which there were several heights available to take into account riverbed height variations below the planks. On one particular wooding operation the gangplank was so steep that the logs had to be slid down the gangplank to the foredeck.164 In the majority of the cases the wood carts, which could hold approximately one third of a cord of wood, were used to transport the wood from the lot to the freight deck. Each gangplank had a raised rail along each side which could be used as a braking device for the cart as it was guided down the plank,165 although caution was required to prevent the carts wheels from binding on the rail and flipping the cart into the river. A crew member, once he learned how to use the carts, became quite adept at handling a fully loaded cart, even when going down some of the steeper planks, and making the right angle turn on the bow of the vessel at the bottom of the gangplank to go through the forward freight doors. When gangplanks
presented no problems and everything went smoothly the whole wood ing up operation, that is the loading and stowing of approximately 20 cords of wood, took from 45 minutes to an hour and a quarter.167

The wood was generally stowed in the wings and aisles, port and starboard of the stokehold, and also midship aft of the boiler. On the upstream run, the wood was also piled in the gangways extending 30 feet aft the boiler. Whenever the wood was stored ready access had at all times to be maintained to both the freight and boiler.168 The firemen tended to keep a couple of cords of dry wood underneath the stokehold to be used only at special times,169 such as when a large quantity of steam was needed in a hurry. All of the wood would be stacked approximately six feet high and was, of course, stowed in equal proportions on both sides of the boiler in order to maintain the vessel's trim. For the same reason the deck hand who was assigned to deliver wood to the fireman, took it from both sides of the vessel at an equal rate.170

Serious difficulties were encountered with wood procurement toward the end of the 1940s and led the company to convert the vessels to oil in the early 1950s. These difficulties were brought on by the depletion of accessible timber stands, the virtual retirement of a number of vessels thereby making the wood camp operations far less economic, and the difficulty of getting labour.171 Another factor
that governed the conversion to oil was undoubtedly the fact that the White Pass and Yukon Route owned the fuel oil outlet in Whitehorse. The coal found around Carmacks had been tried previously and was found to be unsuitable as it was too soft. Furthermore, the quantity of coal required for one trip took up a large amount of valuable freight space and there was also the problem of ash accumulation which was not encountered with wood. The conversion to oil in 1952 required that the vessels be equipped with fuel tanks (these were assembled in the shipyards at Whitehorse) of sufficient capacity for a return trip and any contingency such as grounding.172

Besides fuel the other main requirement for a steamer was a good source of water. Water for the boiler was drawn continuously from the river and was filtered through linseed filters to reduce scale build-up in the boiler and thus reduce the number of times the boiler had to be cleaned. Water for human consumption was drawn from Lake Laberge since the lower part of the river, especially below the Stewart, was noted for its silt-laden water. Although probably not presenting a health hazard, suspended matter in the water was something to be avoided. Vessels, therefore, filled up their containers going across Lake Laberge and dumped what was left at Dawson, getting a refill from the system there for the return voyage. Unlike the water for the boiler or direct human consumption, the water for such
amenities as baths was taken without treatment directly from whatever part of the river the vessel was in and a towel was placed over the sediment once it had settled in the tub.173
The Ship's Company

The superintendent of the river division was responsible for all matters relating to the operation of the British Yukon Navigation Company. This included the hiring of officers and crews to man the company's fleet of vessels. Recruiting was frequently delegated to one of the ship's officers; for example a first mate might recruit deck hands, an engineer the firemen, and so forth. Most of the hiring itself was done out of the company's Vancouver office since very few of the men who served on these vessels were residents of the Yukon. The superintendent was responsible for the negotiation of contracts for the masters, mates and engineers, with the Canadian Merchant Service Guild and the National Association of Marine Engineers.

H. Wheeler, the president of the White Pass and Yukon Route from 1928 to 1940, took a considerable interest in the river division, as can be seen not only by his involvement in the design of the Klondike but also in his attitude toward the men who operated the riverboats. Former riverboat men still view him with affection noting that he was always approachable and very straightforward with
them. Other factors that may also have formed this respect from these men were: only one cut in wages was made during the depression and this was necessitated by the loss of equipment in Skagway, and the cut in salary was restored when the company was able to do so; the company paid the fare of the ship's companies from Vancouver to Whitehorse every year, and, of course, supplied food and accommodation during the working season. There was only one draw back that has been noted which may have detracted from the good will of the ship's company and that was the fact that there was little compensation due to an injury incurred on the job; however, it should be pointed out that such compensation, at that time, was not the rule in most industries.

The depression era of the thirties was not a difficult time for the WP&YR to obtain the necessary crews to work on the vessels for the shipping season in the Yukon. As most of the crew's needs while on board the riverboats were supplied, the salary that was earned could be used, if carefully managed, to support a growing family all year in those financially troubled times. A good percentage of the crews that worked on the vessels every year came from the Vancouver and especially the Fraser Valley areas. The fact that the company had its office in Vancouver probably played a governing factor in determining the origins of the crew. Crew members who had already worked for the company became
its best recruiters by the simple fact that they left the Yukon every year to go home, thereby spreading the word of available work to be had. Some of the recruiters were paid a bonus of 75 dollars a year; however, whether all of them did is not known.\(^5\) Two of the most active recruiters for the company were C. Coghlan and M. Macauley both of whom lived in the Mount Lehman area of British Columbia.\(^6\) As that region was basically farm land, as was most of the Fraser Valley of which it is a part, the personnel recruited by such men as these were farm boys, some as young as 16. The company encouraged the hiring of people with a farming background as they were used to hard, back-breaking work, which for the deck crew was all that was required.\(^7\) The type of work encountered on the river led one former crew member to state that he looked back to that era with a certain nostalgia but never sentiment.\(^8\)

The salary earned, calculated usually by the month, depended, of course, on the position held, and also the year worked. A salary schedule for the years for which records were found has been given in appendix B. Most crew members, besides their regular salary, could make more. Some of this work was optional and some of it was mandatory. The deck crew was expected to work overtime with their regular hours being 6 AM to 6 PM except for accountable watches. They were paid 50 cents an hour in the upper part of the river and 75 cents in the lower for overtime above their regular
monthly salary. The extra work so offered or demanded of them apparently brought their salaries during the 1930s up to $100 per month. The waiters made extra money through tips from the passengers. The galley crew obtained theirs through selling waste food and grease to the Indians. the purser and chief steward had as their sidelines the selling of articles to passengers and also the running of the odd raffle. Even the engineers, as has been noted elsewhere, had, if they so desired, the spare time to pursue another line of work, which in the case of J. Scotland was the making and selling of mastadon ivory jewelry. There was of course always the opportunity to upgrade one's position by obtaining the requisite ticket to become a mate or master to increase one's salary, that is if a position was available. These positions, when they became open, were filled on a seniority basis. For those who had to rely completely on the salary offered them by the company such as the master and pilot, the amount appears to have been sufficient to carry them over the whole year.

The general consensus of those who worked on the riverboats during the thirties is that one could make enough in the summer to carry him over during those months when he would be unemployed. This is not to say, however, that once the shipping season was over, crew members did not look for other jobs, since some of them did. A factor which probably determined whether or not one chose to work in the
winter season would be availability of work and the amount of money saved. Some came out with just as much money as they went in with, namely very little, having spent it in a variety of ways from gambling and drinking to generally enjoying themselves.

Although compensation for work performed appears to have been adequate, the medical benefits for the crew were non-existent. Given the fact that the deck crew's work was at times dangerous and minor and major accidents could be expected, the company's attitude toward such eventualities cannot be termed the best. The potential for serious accidents did exist as one former crew member found out when he lost control of a loaded wood cart on a gangplank and he ended up in the water below with the wood load on top of him; fortunately, no serious injury was sustained in this mishap. A clause in the personnel records of the company states that if a crew member was sick or injured and the services of a company doctor were necessitated, a monthly assessment would be deducted from his salary to reimburse the company for any medical expenses engendered, whether or not the accident was his fault. Emergency medical treatment on board could only go as far as the very basic medical kit, containing antiseptic and bandages carried by the chief steward, and what the knowledge of those on board would allow, with anything further having to wait until port was reached or, if serious enough until a plane could be sent out to retrieve the injured party.
While medical benefits were minimal, masters did receive small retirement pensions into the early 1950s although none of the other officers or crew did. However, when the river division ceased operating after the 1955 season, no thought was given to pensioning off those men (including the remaining masters) who had given long years of service, or to giving them a pension once retirement age was reached. The fact that the company appears to have cut them loose without a second thought has left a certain amount of bitterness toward the WP&YR Company by the former crew members still alive.14

Those who had been engaged by the company the previous summer and whose performances had been satisfactory, received an offer of employment for the upcoming season through the mail during the early months of the new year. The letter specified the particular position, for example, deckhand, and served, in effect, as a sort of preliminary contract, for if the recipient accepted the letter it meant that he was hired for the season.15

Labour requirements varied from year to year depending on the number of boats scheduled to operate and also varied throughout the season. As a consequence the number of men hired from outside the Yukon probably tended to the minimum number required for the working season with the company turning, for the most part, to the indigenous Indian population to fill out the crews when necessary. For this
purpose the working habits of some of the Indians probably were in the company's favour. They appear to have worked long enough to get some money together and then would leave until that ran out. In using Indians to fill out their crews when needed, the company had no transportation costs as they did with those crew members being brought in from the outside, and since the Indians were usually employed as deck hands no specialized skills were required, and these workers could easily be replaced.  

When the time came to go up to the Yukon in the spring of the year, the crew members congregated in Vancouver to take the steamer north to Skagway. The deck crew generally reported on the first of May, the firemen did so about two weeks earlier. There was also the bull crew which had gone up earlier to work in the yard. The company paid all of the expenses of transporting the crews north, even to the point of paying for any stayovers due to unforeseen delays such as poor weather. The contract, to which all of the crew members agreed, stated that once their way had been paid they agreed to stay 60 days, and if they left or were terminated before this time, they agreed to reimburse the company for this trip. If a crew member worked the entire season his way out was paid by the company.

For the trip up in the spring, the crew members usually divided their belongings into a small bag that would hold their requirements for the trip to Whitehorse and a trunk
for the rest of their gear which was sent in bond to Whitehorse. This division, although not necessary, made the trip easier as the baggage being sent in bond would not have to be checked through the customs stations at Skagway and Whitehorse. Good clothes were worn on the trip up north, often the only time in the whole summer that they would be worn.19

The crews leaving Vancouver travelled first class on one of the CPR Princess boats (often the Louise) to Skagway which probably gave the new recruits a false impression. Such an impression was quickly shattered once Whitehorse was reached where the accommodation was anything but first class. The bunkhouse where the crews were housed while the vessels were being readied in the yard was called "Hotel Disaster". The "Hotel" was an old house only used for this purpose. The bunks were 3 tiers high in some cases, and rags were used to plug the holes in the windows. Heating was supplied by air tight heaters placed where required.20

Even though the men worked six days a week, readying the boats for launching, there was still time to go out on the town or to lose one's money in the inevitable poker game. Saturday night appears to have been the time to let loose, for after cleaning up and possibly washing one's clothes using the steam from the boiler in the shipyard, a poker game would be started that might last until the
following morning. Time on shore came to an end once the ships were launched.

Crew placement was determined by the officers responsible for the various vessel departments prior to the actual launching of the ships. The object was to assemble a crew that could work as harmoniously as possible. In assigning crew members to particular vessels, an effort was made to get a mix of experienced and green men so that the former could teach the latter the ropes. Although the crew were assigned to particular boats, individuals might be moved to other vessels depending on labour requirements.

The ship's company was divided into several departments: navigation, engineering, deck and steward, and so forth. Each department, except navigation, consisted of one or more officers and crew. The skipper, chief officer (known as the pilot) and possibly a second pilot comprised the navigation department, all of whom were officers.

For those who planned to make the river a career there were several paths that could be taken to become part of the officer class where the level of renumeration was higher. The positions of purser and chief steward were open to those who had a certain competency with paper work and at the same time knew how to handle people. The purser was responsible for most of the paper work on board and had to deal directly with the passengers. The chief steward was accountable for the work of the cabin crew, the victualling of the vessel,
and to a limited extent the comfort of the passengers. For the other officers, that is those responsible for the actual vessel, such as the mates, masters and engineers, there were more stringent requirements to be met. Each of these latter positions required a certificate of competence, generally referred to as a "ticket," for which exams had to be passed before a person could even get on the waiting list to fill one of these senior positions. Once on the waiting list, promotion through the ranks was strictly on a seniority basis. Such movement was viable as long as the number of vessels operating on the river did not diminish. After WW II opportunities for advancement became somewhat circumscribed as the vessels sailing the river became fewer in number and it was not at all unusual in those latter years to have, for example, three pilots on board a ship at one time.24

Accommodations aboard ship for the officers and crew were spartan.25 Except for the deck crew and firemen, whose quarters are dealt with in another section of this report, the ship's company was housed in what could be termed regular staterooms. There were, of course, variations in cabin size and the number of bunks in the staterooms with the officers having one bunk per cabin, the crew two. Frequently the compartments occupied by the crew were ones that had hog chains and hog posts going through them, making their layouts slightly irregular.26
The bedding, linen and towelling for the officers and crew were provided by the company. These were changed once a week when the ship returned to Whitehorse where the laundry was located. The furnishings of the staterooms occupied by the crew were no different from the passenger's cabins: each contained a carpet, sink, commode pail, mirror, wallrack, water glass rack, chair, possibly a table if it was an officer's cabin and possibly some minor variations such as a shelf up on one of the bulkheads.

The light weight construction of the Klondike's bulkheads made cabins functional only in so far as providing shelter from wind, rain or snow but not the temperature changes which could be quite drastic. It appears that the only cabins that originally contained some form of ventilation were those of the officers. When the extremes of temperatures were reached, there appears to have been little escape for the ordinary crew members. In summer they would have to endure the heat with the rest of the passengers, possibly finding some respite from the heat on the decks if there was a breeze. In the summer, except for the possibility of air circulation engendered by the inclusion of an air vent in some of their cabins, the officers' lot was not much better.

In the spring and fall of the year, when it could get very cold, the difference in comfort level between officers
and crew became more pronounced. For an officer some of the chill could be removed from the air in the cabin through the agency of steam radiators that may have been located there. Down comforters were also supplied to the officers.\(^{32}\) The regular crew member was not as lucky, as there appears to have been no radiator in his cabin and the down comforters were strictly for the officers; the ordinary crew member had to make do with an extra blanket.\(^{33}\) There were areas of warmth to which the cold crew member could resort, one of which was the galley and the other the stokehold on the freight deck; however, in both of these areas one was more than likely to be chased away by those working there as these havens from the cold were barely large enough to allow the performance of the functions for which they had been designed.\(^{34}\) During the cold weather a regular crew member had little respite from discomfort, particularly while on watch. Some members of the crew tried to bargain with officers whose cabins were heated by offering them suitable compensation for being allowed to sleep in their cabins when the officers were not using them, but this was the exception and not the rule.

Storage for personal effects and cloths varied according to one's position in the ship's hierarchy. For the crew members housed in what was called the fo'c's'le (on the aft quarter of the main deck), clothes and the like were stored in suitcases or trunks that could be stowed below the
lower bunks. A small clothes closet was also provided for these crew members. The cabin and galley crew, who had what amounted to regular staterooms, had the luxury of having sufficient space to have small steamer trunks in their cabins, which allowed greater latitude in storing personal effects. Even here the general practice was to have suitcases or trunks that could be placed under the lower bunks. The officers were all supplied with cabins containing drawers below their bunks, in which personal effects could be stowed. The more senior officers also had clothes closets to hold their uniforms. Even with this amount of storage space available, some officers still had steamer trunks in their cabins or stored them at the commissary, taking on board only what was required for the particular season or voyage.

While towels and linens were changed weekly by the company, the crew members were responsible for washing their own clothes. Even the officers, who had their cabins cleaned and changed for them by the cabin stewards, generally did their own laundry. This function, if it could not be performed in the sink in the stateroom, was generally done on the freight deck near the engine room. One could either use a bucket of water, into which a handful of sugy powder, a powerful lye soap, had been placed, and a plunger to get the clothes clean, or use live steam. The clothes, once washed, were generally hung on a line
stretched along the outside of the ship aft of the aft freight doors; however, they could also be hung anywhere where there was a breeze and did not interfere with the regular ship's functions which generally meant the aft saloon deck on the Klondike, if there were few or no passengers on board. Ironing, aside from officers uniforms, was only done to clothes that were to be worn on a night on the town or those that were going to be worn when leaving the Yukon at the end of the season; regular work clothes were simply worn as they came off the line.

Personal hygiene was of course the responsibility of the individual crew member. The close quarters in which the men lived and worked dictated in part the frequency with which these functions were performed. Haircuts could be obtained in town or from one of the other crew members. Two showers, supplied with hot water from the boiler, were located aft of the fo'c's'le, one of which was generally used by the deck crew and the other by the firemen. These showers were also available to other crew members and the officers. There was a bath tub for the convenience of the passengers and officers in one of the cabins on the Texas deck, and possibly a bath tub in the washroom on the port side of the saloon deck on the Klondike.

The meals for the officers and men were the same as those served to the passengers, but again the location in
which the meals were consumed depended on one's position in the ship's hierarchy. The officers had their own table in the ship's dining room where they would be served by the waiters. To eat here, however, meant wearing a uniform when passengers were onboard, which the mates and engineers, at times, found inconvenient and at such times they chose to eat in the crew's mess with the rest of the crew. The waiters who served the officers and passengers only sat down to eat after the passengers had been fed, and they would simply take one of the tables in the dining room. The rest of the crew, and those officers who chose to do so, ate in the crew's mess, which on the Klondike was located just starboard of the galley on the saloon deck. The crew's mess contained a long table covered with an oil cloth, and a long bench on either side of the table. The table was always set with the condiments used at most meals. The mess boy was responsible for setting the table and serving the crew in the crew's mess, with the food being handed through a pass-through from the galley. Generally, most of the crew came up at one time to eat; however, those who were on accountable watches, were served individually prior to or after the rest of the crew. Food was available to the crew during the night and early morning, such as prior or subsequent to an evening wood stop, however, at these times the crew members were expected to serve themselves from the victuals left out for them and
to leave the galley as clean as they found it. A large pot of coffee was always available, whether for mug-up time at 10 p.m. or for the inevitable stops when the crew would be rousted out of bed.48

Leisure activities were, considering space restrictions, limited in scope. The favourite pastime appears to have been playing cards and a table and chairs were set up on the freight deck near the aft freight doors. The games played were generally poker, bridge, euchre or cribbage. Typical shipboard games such as quoits and shuffle board were also played, and a shuffle board court was painted on the freight deck for the use of the crew, or, if it was not in use, the court on the saloon deck aft used by the passengers was put into play.50 A number of the officers and crew also enjoyed reading newspapers, general interest magazines, sports magazines, detective and western stories as well as men's books and magazines,51 many of which were left behind by the passengers. Outside information could only be obtained from newspapers either left behind by the passengers, bought in Whitehorse or sent up through the mail from the "outside", radio reception on the river being nonexistent.53 The times off watch were also used to write letters home, using stationery which had been bought in Whitehorse.52

Although ultimate responsibility for discipline rested with the master of the vessel, the actual work of keeping
the men in line was divided into three specific areas: the mates looked after the deck crew, the engineers looked after the firemen and the chief steward looked after the cabin crew, which included galley personnel. Potentially, the toughest segment of the ship's complement to control was also its most transitory, namely the deck crew. According to the mates, as long as one did his job there would be no problem; however, if there was a clash of personalities or an unwillingness to perform the required duties, the person(s) in question would be asked to quit, and if he did not comply, he was subject to immediate dismissal. A number of what were described as "Captain Bligh" tactics were also used to keep the crew in line. The individual deck crew members were certainly not indispensible as a number of them found out in Dawson when they refused to ship at the required time; the master simply hired a number of local Indians to replace them, and left the recalcitrant crew in port, without jobs, to find their own way home. Few discipline problems were encountered during the 1930s; however, the war years and those that followed were not as problem-free. The war years, when the Alcan road was being put through, saw a lot of soldiers in the Yukon and on the riverboats. Direct control of these men was not under the ship's officers but under the military command which led to a lot of problems. The ship's officers, therefore, had
no control over these men and smoking on barges loaded with gasoline, excessive drinking and absence at departure times were not at all unusual.56 Once the war years were over, the officers had to contend with another element, which, although more manageable, did present its own problems. Apparently some law courts along with the west coast offered certain young men that appeared before them the option of spending six months in jail or six months working in the north. These men known as 'zoot suiters' because of their style of dress, were generally drug offenders. They came north with the clothes, the hair style, and attitudes which gave them their names, the hair style, all of which they were very quickly relieved of by the ship's crew. According to one former crew member, this element was quickly trimmed down to size and once they had settled down, managed to survive the season with some of them actually coming back up the following season.57

The close quarters in which the men lived required outlets for tension. The practical joke appears to have played its part in keeping the ship functioning on an even keel. The jokes included leaving a man, when lunch was called, up a mast which he was painting, nailing the shoes of a sleeping crew member to the deck, and painting the derrière of one of the crew red after he had overindulged.58
Alcohol was a normal concomitant of socializing although there is no evidence to suggest that there was ever a liquor problem on board the ship. Drinking off-duty does not seem to have been prohibited on the vessel but moderation was absolutely essential. As recalled by a former officer, the ship was home for the season and was treated as such. It was not unusual for crew members to buy beer when in port, and consume it with the rest of the crew during the arduous task of unloading and loading. The deck crew was not averse to caving in the odd barrel of concentrated rum being sent up to Dawson, when such cargo was being loaded. Such an event would have most members of the work force scurrying for any container they could get a hold of to try to salvage as much of this precious cargo as possible, keeping it of course only for medicinal purposes. Overindulgence could and did lead to the odd fight to rectify real or imagined grievances. At such times, if the altercation could not be brought under control through regular means, turning the hoses on the combatants generally had the desired effect. The company and officers realized that such encounters were inevitable, and as they usually cleared the air were not reason for dismissal.

Because the work was hard and done in the company of other like-minded men, language that in some levels of society would not have been readily acceptable, was not
unknown. When passengers were on board a special effort was made to ensure that offensive language was not used and that general comportment was of a high order. Such strictures were not so pronounced on boats carrying no passengers, although behaviour which would adversely affect the proper functioning of the vessel or the authority of the officers was never tolerated.62

Private female companionship was not generally tolerated on board ship. Given the accommodation for most of the crew, only the officers would have been in a position to take advantage of it if it had been allowed, which it was not. This did not mean one could not take a girl on board and have a coffee or chat or organize a party, but the official line was drawn at this point.63

The Officers
A vessel could be considered to be a living entity having, besides a controlling intelligence, various semi-independent appendages that performed all of the required and diverse functions. If the master was the brain and eyes of the vessel then the motive power was under the aegis of the engineers. The engineers ruled over the engine department and besides making sure everything was mechanically operational were responsible for the firemen who stoked the boiler. The physical labour associated with freight and fuel handling was performed by the deck crew which
functioned under the watchful eyes of the mates. The housekeeping chores were carried out by two groups under the control of the chief steward. The duties of dining room waiter and cabin steward were performed by the same individuals who, in a manner of speaking, merely changed gloves when one function was finished to perform the other. The kitchen duties were handled by the galley crew who also came under the control of the chief steward. All of the functions so far mentioned can be considered integral to the operation of the vessel, in the sense that for this "organism" to operate all the above duties had to be performed. A living entity must also interact with the external world to exist, and the purser, who in effect was the ship's business agent, provided such intercourse. The above scheme is rather simplified as the interaction of the various levels or appendages was much more complex and in some cases the levels overlapped.

Master Pilot
The man in control of the vessel and whose decision was final in any dispute that might arise on board the craft was the master. He was often a man who had worked up through the ranks from second mate, first mate, possibly cub pilot, pilot and then, when sufficient experience had been obtained and when a position became available, master of his own vessel. A certificate of competency was required to
be a mate, another one to be a master. The certificates were graded according to the level of competency required to operate a vessel on a particular type of waterway. In the case of the Yukon and its tributaries, which were classified as minor inland waterways, the lowest grade of certificate was required. There were areas, such as the engine room, steward's functions and purser's sphere of operation with which he might not be intimately familiar; however, his knowledge of the vessel and its operation was substantial. There was one other requirement for master and that was that he be a British subject. In relation to some of the other officer's positions on board the vessel very little has been written here concerning the master's or pilot's functions. This is not to imply that this position was an easy one. The actual control of a vessel of the Klondike's size, or for that matter any of the other WP&YR vessels, along a river such as the Yukon River, required a skill that very few people acquired easily. The position required an intimate knowledge of the river, of the vessel, and of all the techniques and tricks in operating the same, handling men, delegating authority, how to clear and enter a vessel, decide stops, etc., which could only be acquired through what was, in a sense, a long apprenticeship period.

The pilot was expected to operate the vessel when the master was not and, therefore, had to know the river and how to handle the vessel under all circumstances. The pilot on
a Yukon steamboat was not a pilot in the generally understood sense, that is someone who is not one of the ship's officers and whose sole responsibility is to bring a vessel into port; rather a pilot on these boats was synonymous with chief officer and when on duty was expected to perform all the functions of the master. Experience in the operation of the vessel was obtained through on the job training prior to being appointed pilot. A first mate could obtain steering time on easy sections of the river, allowing at such times a pilot or master a needed break. An apprentice period as cub pilot may also have been put in before the rank of pilot was attained. Such a position offered much greater time at the wheel to learn the river than would be allowed to a first mate who had other duties to perform. It was hoped that the first mate would be permitted sufficient time at the wheel so that when he was given the pilot's position he would know the river and would not have to start from square one. Such extensive preliminary experience prior to becoming a pilot was not always the case if what happened to the Klondike I is an indication.

The first master and pilot on the Klondike II were C. Coghlan and W. Bromley respectively. This combination remained in effect until at least 1941, when W. Bromley obtained his master's ticket, at which time he moved over to the Nasutlin. The master or pilot could be moved from one
vessel to another during the season; the fact that he had been assigned to a particular ship at the beginning of the season did not necessarily mean he spent all of his time there.

The usual sphere of operation of the master, as for the pilot, was the wheelhouse which was known in riverboat parlance as monkey island. The time spent in the wheelhouse on watch varied from vessel to vessel, depending on the number of pilots and the wishes of the captain. For example, the watches might be six on-six off if there were only a master and pilot (in which case each worked 12 hours over a 24 hour period), or four on - eight off if there were two pilots (in which case each individual worked eight hours out of 24). Captain Bromley, who became master of the Klondike after the Klondike's first master C. Coghlan retired, chose to work the 6 to 12 shift both AM and PM. Even when his time in the wheelhouse was completed, regular demands were made upon the master's time, such as tours of inspection to make sure that everything was as it should be.

The wheelhouse was raised above the Texas deck and allowed an unobstructed 360 degree view of the surroundings. The heat of the day during the summer season could be partially alleviated by opening the windows. A dodger, which was a piece of canvas attached to the bottom of the window in such a manner that it directed the incoming wind above the helmsman's head when the window was open, was used. A
sunshade was placed above the forward window for obvious reasons. When the Klondike II was launched, the wheelhouse was fitted out with steam heat radiators to provide warmth in the spring and fall of the year; however, in the fall of the first year of its operation this source of heat was found to be inadequate and an air tight heater, which was standard equipment on the other vessels, was installed. A cushioned bench was located in the rear end of the wheelhouse for the convenience of visitors or even for the master at such times as the helm would be taken by a first mate who wanted to learn the river.

The level of activity in the wheelhouse during a watch could vary quite drastically depending upon river conditions, weather, whether it was an upstream or downstream run and what part of the river was being traversed. The upstream run was generally undemanding, allowing whoever was in control of the vessel to sit in the captain's chair and chat with company that was invited to visit the wheelhouse, or even to read a newspaper while steering the vessel. The downstream run was another matter for at such times a master or pilot could expect to stand at the wheel the full shift without any relief, performing bodily functions at such times in the most expedient way, which generally meant using the fire buckets in the rack located on the Texas deck directly behind the wheelhouse.
The master of a vessel was also responsible for a certain amount of paper work. A rough log book was kept in the wheelhouse in which arrivals, departures, quantity of wood taken on and any unusual occurrences or events were recorded. This rough log would be taken, just before the end of a voyage, by the purser who typed up a good copy for the main office. Fuel vouchers also had to be signed by the master since he decided the quantity of wood to be taken on at any one wooding stop. Besides the rough log book and fuel vouchers, the master had also to sign the payroll at the end of the month for the crew under his command.

The location and size of the master's and pilot's cabins reflected the function and position of these two officials. Their cabins were the two foremost ones on the Texas deck which allowed them, if required, an immediate surveillance of the river. As their hours of sleep could be any time of the day, passengers were requested to be quiet when they were near these cabins. The cabins themselves, as has already been noted, were larger than the regular staterooms; however, besides having only one bunk with drawers below it, a clothes closet, a table and chair and heating pipes, their furnishings did not vary greatly from those in the passengers' cabins.

When there were passengers on board, the master and pilot were expected to wear uniforms. Throughout most
of this period, if the vessel did not carry passengers, the officers wore normal work clothes. Prior to 1945 the uniform was a blue serge suit (provided by the officer) on which the buttons had been exchanged for brass company buttons. Rank was denoted on a cap badge which simply stated master, pilot, 2nd mate, 1st mate, and so on. After the war, when some officers who had seen military service returned, rank was designated by stripes on the sleeve: 4 denoting skipper, 3 the first mate and two the second mate. The cap badge, at this time, simply showed the company colours.

When the Klondike II was converted to cruise service, a more formal attitude concerning dress was instituted by the company, for according to the last master:

"On this deluxe cruise ship you'd have to go around like a dressed up chinese admiral...you didn't dare stick your head out the door (without) your collar and tie on."

The Engineers

In so far as the engine room was concerned, the chief engineer enjoyed virtually the same status and authority as the captain, although the captain had, of course, final responsibility and authority for all operations on board the vessel. The engineer's function was basically to keep the engines and all other mechanical systems working as smoothly as possible. His principal objective was efficiency, and
this objective was somewhat different from that of the master. For example, the chief engineer would have preferred that the stern of the vessel be lower than the bow so that as much water as possible would be directed into the paddlewheel for maximum efficiency. The master, however, generally insisted that the bow be lower than the stern in order to avoid grounding, or, in the event that the vessel did run aground, that getting it off the bar would be easier. The chief engineer would also have preferred to run the boiler with a low fire to conserve fuel. The master, however, wanted a large reserve of power at his finger tips and this meant a higher fire and greater fuel consumption. Notwithstanding these "conflicting" objectives the master, who of course, had ultimate authority, and the chief engineer worked together as closely as possible and generally got along very well; otherwise the smooth operation of the vessel would have been jeopardized.79

The Klondike carried at least two engineers - a chief and a second - who divided their watches in much the same way as the master and pilot(s). The chief engineer was responsible for the engine department which included the firemen.80 The engineer controlled the speed of the vessel as directed by the master by means of the throttle which admitted the correct amount of steam into the engines and he also responded to instructions from the wheelhouse for reversing the motion of the engines as required. To keep the
engines operating the engineers were called upon to do many things. Engines had to be continually maintained and repaired and this entailed lubricating moving parts, grinding globe valves, regrinding the throttle valves, etc.\textsuperscript{71} It was absolutely essential that the engineers be able to handle a wide range of repairs since it would have been impractical to wait for spare parts to be sent up from Whitehorse, or to have a vessel disabled for any period of time. In addition to housing the engines and a wide variety of ancillary equipment the engine room was thus in effect a small and specialized machine shop. This naturally resulted in considerable savings of time and money for the company. If the level of maintenance of the engines could be measured by cleanliness of the engine room and the shine on the brass located there, the fear of breakdown must have been minimal.\textsuperscript{82} The engineer was also called upon to perform a certain amount of paper work. The engineer was required to keep the engineer's stores fully provisioned which meant filling out the necessary requisition forms. He would also keep his own log of the trip which contained details of engine room activity such as fuel consumption, watches, repairs, etc.

Both the chief and second engineers who worked on the Klondike II in the early years, Johnny Scotland and Jock Ford, appear to have been competent jewelry craftsmen, pursuing this interest as time allowed.\textsuperscript{83} The jewelry,
for most part, was fashioned out of mastadon ivory which was uncovered by the hydraulic mining done around Dawson. Johnny Scotland fashioned a small lathe which he kept in the engine room to work on the ivory; however, most of the equipment and materials necessary to make this jewelry were stored in the engineers' staterooms and taken to the machine shop when being worked on. This sideline appears to have been quite profitable, as Scotland apparently sold a chess set which he made out of ivory for $1500.84 A later engineer, Jack Elliot, even had his own outlet in Whitehorse, called the Ivory Shop, which is still run by his daughter. The lucrative aspect of this jewelry making sideline was such that other crew members became interested and Scotland was not at all avers to showing them how to manufacture their own.85

The engineers' quarters were located in the aft two cabins on the Texas deck. These cabins were larger than the ordinary staterooms and almost on a par with those of the master and pilot, and may have contained the same sort of furnishings as the latter.

The Mates
The deck department, consisting of the mates, deckhands, and, on occasion, workaways, was responsible for the manual movement of freight and wood fuel, lining up and attending to the physical labour involved in getting a grounded vessel floating again.
Many of the mates were drawn from the deckcrew. To qualify for a mate an individual had to be a British subject and hold the required certificate of competency as specified in the Canada Shipping Act. To obtain the certificate, or mate's ticket as it was called, the prospective candidate had to pass a four hour written and oral exam, which for many mates on Yukon riverboats was administered by the steamship inspection office at Vancouver. A ten day preparatory course, also given in Vancouver, was available. The course, which cost $40 in the 1930s, was intended, as one former crew member put it, to teach the rules of the road. Once an individual became a mate he automatically became a member of the merchant seaman's guild and one of the vessel's officers.86

Some of the first and second mates had the ambition to become a master. The natural progression was: second mate, first mate, (cub pilot), pilot and master. To make the jump from mate to pilot required an intimate knowledge of the river, which could only be obtained through experience and hence, in addition to this regular 12 hour shift the mate who had an ambition to move up the ship's hierarchy could spend another 6 hours a day obtaining the requisite knowledge.87

The mates' responsibility was to look after the manual labour required to run a river boat on the Yukon River. The first mate was on duty when the freight was stowed as he was
responsible for the trim of the vessel. Some mates helped with the actual loading although this was not required. The first mate had to be on hand when the ship was being lined up through any of the rapids. Some of the other main functions of both mates included: responsibility for all the gear required for the ship's operation, such as ropes, blocks and tackles; checking the bilges regularly for leaks, which was usually left to the second mate; keeping a record of the crew's hours; and making sure that the life boats were watertight. Each mate worked 12 hours a day, usually from 6 to 6, with the first mate taking the day time watch. However, as there were functions for which the first mate was specifically responsible, he was always on call. Althoug officers of the vessel, the mates worked at close hand with the deck crew and found themselves more closely associated with them than the other officers.

The mates, as with all of the other officers on board the vessel, provided their own suits. Because of their position and their sphere of responsibility, however, the mates on the Klondike frequently wore work clothes when there were no tourists aboard, rank being distinguished by marine caps with the position designated on the cap badge. When not in uniform the mates usually ate with the crew in the crew's mess, since uniforms were required to eat in the dining room.
The first and second mates' were accommodated in cabins immediately aft of the master's and pilot's cabins respectively. Their staterooms contained a single bunk with the appropriate drawers for storage and possibly a table upon which required paper work was carried out. The latter reflected the fact that the cabins doubled as offices. All records concerning the crew, the craft and the river were kept there. These rooms were also used to store items that were in constant demand and for which the mates were responsible, such as batteries for flash lights and bulbs for the various running lights. In other respects their staterooms were very much like those of the passengers.93

The Chief Steward
The chief steward was responsible for the victualling and the household needs of the vessel. His department consisted of the galley crew and the cabin crew. The cabin crew performed two functions, that of waiters in the dining room and when this was completed that of cabin stewards. In calculating the food and housekeeping requirements (linens, etc.) of the vessel, the chief steward had to estimate what would be needed for a complete voyage based on the size of the ship's company and number of passengers. He prepared a list of the required needs and gave it to the Port Steward in Whitehorse who was responsible for filling the
order. The victuals ordered by the chief steward naturally dictated what would be offered and the menus, which were prepared for each meal, were his responsibility as were the table settings.

The chief steward was also given the responsibility of the first aid kit which he kept in his stateroom. The kit contained a sufficient amount of material to handle most scrapes and cuts which would normally be incurred on board the vessel. More serious injuries were handled by making the victim as comfortable as possible until either Dawson or Whitehorse were reached where proper medical facilities were available. If necessary a plane could be summoned by using the purser's radio and the telegraph line that ran along the river, to take the injured party to Whitehorse or Dawson with the maximum wait for such emergency probably being one half a day.

As an officer the chief steward was given a cabin which contained a single bunk with drawers below it besides all the other normal stateroom fixtures and fittings. On the Klondike the chief steward's cabin, along with that of the purser, was located on the saloon deck.

The chief steward's salary, although substantial, and equivalent to the other officers, was also supplemented through various means. The Klondike had a cabinet in the observation room containing tobacco, candy and post cards
that could be bought from the chief steward.\textsuperscript{97} He could also, if there were enough tourists on board, run a raffle with the prize generally being a Hudson's Bay blanket.\textsuperscript{98} The profit of both these ventures would end up in the pocket of this officer.

The Purser

Most of the work associated with freight consignments and passengers was handled by an officer who was in effect the company's business representative on board the vessel. He was known as the purser. His routine involved some of the general paper work required for running the ship; all the paper work that was connected with the freight carried; the mail for upriver and downriver stops; the berthing of passengers and some of the general needs of the passengers.\textsuperscript{99}

More than anything, paper work occupied most of the purser's time and even in the spring when the vessels were being readied for the launching, he was likely to be at the office at a desk than in the ship yard. It was the responsibility of the purser, prior to the launching of the vessels, to complete all of the paper work necessary to engage the crews. He had to lay out the ship's articles, list the crew and have the articles signed, approved and stamped by the custom agent. Pursers were also responsible for the pay rolls and all legal work required for
immigration inspection. Once all of the above was done and only then were the crews ready to move onto the ships and start the season.100

When the season was underway and the vessels were operating on their regular schedules it was the purser who generally was the last to board the vessel when it was leaving port. It was his job to pick up any last minute messages and mail. His first priority on boarding the compilation of the landing list which had to be distributed fairly quickly to the engine room and wheelhouse.

The landing list, compiled from passenger, mail and freight destination information, stated at which places along the river stops had to be made.101 The information as to mail stops was derived from the mail itself which had been dropped in a mailbag in the purser's office by one of the crew. This bundle of mail had of course to be sorted before the required information could be obtained. The bag contained mail for stops along the river, not including Dawson and Whitehorse. The way mail was sorted into a series of pigeon holes on one of the bulkheads in the purser's office. The office also contained several ordinary mail sacks into which mail that was picked up along the river but destined for places not served by the vessel could be sorted later in Whitehorse by the post office. Freight destinations were extracted from the freight bills that were obtained from the office in Whitehorse.102
The tickets collected from the passengers upon boarding, not those he sold to last minute arrivals, provided him with the locations and number of passenger stops the vessel had to make along the river. The information so gathered and compiled was vital both the wheelhouse and the engine room, and had to be distributed as quickly as possible so that a course of action regarding landings could be formulated.

Besides collecting and selling tickets to late arrivals and informing the passengers as to what meal sitting they had been assigned, the purser also provided other services to the passengers. Firearms were prohibited in the staterooms and were stored in the purser's office, as were any valuables, for the purser was also responsible for the safe that was carried aboard. He was also an American Express agent and was commissioned by the government to take affidavits: both functions provided him with additional pocket money. His income was further augmented by selling to the passengers such items as post cards and possibly playing cards, samples of which were posted on a bulletin board outside his office. The notice board was used for the same purpose by the steward and it was also used by both of these officers to inform the passengers of any special activities such as shuffleboard, quoits or a dance down on the freight deck. One of the more important functions of the purser, from the passenger's
viewpoint, was that he notified them in the middle of the night when they reached their destination.\textsuperscript{106}

The paper work associated with the freight took up a good deal of the purser's time and energy, particularly on the downstream run. The main document here was the freight way bill supplied by the office at Whitehorse, which gave the date, consignee, a rough description of the goods, the weight, the unit rate of the materials and the cost of shipping. These were arranged by the purser in order of unloading once the vessel was underway. The purser had to make a copy of every way bill for his own records. At every way stop where freight was to be unloaded the cargo had to be checked against the bill, signed by the consignee and any charges due such as freight or C.O.D. collected by the purser. The purser, for this purpose, had a cash drawer which was also used for any other cash transactions, such as the sale of tickets.\textsuperscript{107} All the completed forms, noting any irregularities to shipments, were returned to the Whitehorse office at the end of each voyage. Where the freight was consigned to someone in Alaska customs papers along with the appropriate freight bills had to be made out and ready by the time the ship reached Dawson.\textsuperscript{109}

The upriver run was simpler for the purser even though the number of passengers carried might be the same. Besides the fact that the trip upriver took substantially longer, giving the purser more time to do his work, the main cargo
carried was ore with the only requirement being that the purser keep accurate track of the number of ore sacks loaded. Gold was still being sent out of Dawson and the surrounding communities; however, this took up very little space and was stored in the safe which was located near the purser's office. There was also way cargo that was simply being transferred from one point on the river to another, such as the movement of a wood camp to a better location; however, the way cargo was small in relation to total cargo carried. The majority of upriver freight tended to be the ore concentrate for shipment out of the Yukon.

In addition to the paper work associated with the freight and the passengers, the purser was responsible for keeping records of the wood consumed by the vessel. It was the master who decided where and how much wood would be taken on board; however, once this decision had been made the rest was left up to the purser, and when the ship was pulling into a woodcamp it was the purser who was first off of the vessel with a measuring stick and piece of chalk to mark off the required number of cords of wood to be taken on. This information would be recorded on a fuel voucher, which would also note the name of the wood cutter whose wood was being stowed on board. The master would sign the voucher and record it in his own log book, and a copy of the voucher would be given to the wood camp operator if he were
there or left at his mail drop, and another copy would go to the Whitehorse office. Besides recording the quantity of the wood taken, the purser also appears to have looked after the needs of the cutter, obtaining supplies that were required from Whitehorse and delivering them when the opportunity arose.

As noted earlier, the downstream run took considerably less time than the upstream trip and since most of the purser's work and the greatest demands on his time came during the trip to Dawson, a purser might find himself going 36 hours without sleep on that segment of the voyage.\textsuperscript{113} On the Klondike II the purser's office was also his sleeping quarters, which did not allow him the solitude to sleep in those moments when he could grab some rest. This was mainly due to his function as the ship's representative to the passengers who came to him for information and supplies even when his door was closed. He, furthermore, had no set hours and was on 24 hour call. For the above reasons the purser generally tried to get a stateroom, if available, which he would use as his sleeping quarters. He would inform the ticket agent in port which stateroom he had taken for himself, and this would be crossed out on the berthing list so that it would be the last cabin assigned to passengers and only when the need arose. One of the mates or his designate might fill in for the purser by measuring the wood and completing the requisite forms for both wood and
freight, thereby enabling the purser to get some sleep.114

Prior to arrival at Whitehorse, it was the purser's job to make a typed copy of the rough log book kept in the wheelhouse to be handed into the office. This original was typed with indelible ink for another copy was kept by the purser, with the duplication being obtained through the use of a letter press.115

There was one piece of equipment in the purser's office, which, although seldom used, was mandatory to the well-being of crew and passengers, namely the field telephone. A telegraph line ran all along the river and it was tapped when the need arose. Contact was made with the telegraph line through the medium of a pole containing a conductor, which was hooked over the line. The nearest station was raised and the problem stated. Such equipment was extremely important in case of an emergency, such as the sinking of the Klondike, so that aid could be sent quickly as possible.116

The Crew
The ship's crew was divided into three sections. The firemen, who stoked the boiler, worked under the engineers. The deck crew reported to the mates. The waiters, who doubled as cabin stewards, and the galley crew were under the chief steward.
Firemen

The workforce that stoked the boiler was made up of three firemen. As had already been noted, they were under the province of the engineers and took their orders directly from them. The firemen's quarters, which consisted of a three bunk cabin, was located aft of the engine room in what was termed the "fo's'c'le". The cabin was located on the port side of the vessel and unlike the deck crew's cabins, had enough room for slightly more comfortable surroundings.\(^{117}\) The firemen, although viewed by some as being on the same level as the deck crew, appear to have been quite different, for they were not as transitory as the deck crew proper and it was not at all unusual to meet a 20 year man still handling the wood in the stokehold.\(^{118}\)

Because of the heat in the stokehold, the firemen's watch was shorter than most. The firemen worked 4 hours on and 8 hours off which meant that 3 firemen were required to fill a full 24 hour period.\(^{119}\) As this was a job that required full time attention when the ship was operating, relief for bodily functions and meals could only be obtained when someone was available to spell the men on duty. As this was an accountable watch, the firemen generally had their meals before or after their stints in the stokehold;\(^{120}\) however, this was not always possible, and as the firemen generally worked very closely with the engineers their needs could generally be met during the various stops the vessel made.\(^{121}\)
The main area of operation of the fireman was the stokehold, from which he could control almost all that was necessary to perform his duties. The stokehold was located at the forward end of the boiler, which itself sat fore-aft just aft of the forward freight deck bulkhead. As the boiler sat as low as possible in the hull of the Klondike, it was necessary to construct a stokehold approximately two and one half feet lower than the main deck in order that access to the boiler could be obtained. The fireman faced the door that allowed access into the fire box and through which most of his energy was expended. Besides looking after the fire, he was also responsible for maintaining the level of water in the boiler, the loss rate of which was dictated by the consumption of steam by the engines. A metal bobber on the right of the boiler face informed the fireman how fast the water pump in the engine room, which fed the water through the economizer to the boiler, was working. The economizer preheated the water, extracting all the heat possible out of the waste gases going up the stack. If the gauge indicated a greater consumption of water than was being fed into the boiler, the fireman merely had to "scratch a valve," thereby increasing the water input. There were actually two ways of noting the quantity of water in the boiler, one was a gauge which could easily be seen from the stokehold, and the other was a series of steam cocks which could be brought into play either to check the
accuracy of the gauge or be used if the glass gauge was broken.  

"Forced draught" pulled a greater quantity of air through the fire box, thereby obtaining a hotter and stronger fire which was necessary to burn green or wet wood, or simply to produce a larger quantity of steam. Because the Klondike had compound condensing engines, no exhaust steam went up the funnel and so another device had to be used to obtain the necessary forced draught. This consisted of a blower which simply forced live steam up the funnel and obtained the same, if not greater, effect than the exhaust steam used on other vessels. The control for the blower, which was the responsibility of the firemen, was located in the stokehold. The use of the blower, instead of the exhaust steam, to get the forced draught also made the Klondike sound different from the other vessels that did not have such a system. Instead of the locomotive type chugging heard with the vessels that did not have the condensers, the Klondike's sound was more like a continuous WHOOSH when the blower was engaged. Once the blower was on full blast, it could force large chunks of burning ash up through the stack, increasing the danger of fire and also the amount of work for the deck boy. Generally green wood was burned with dry wood so that use of the blower would be limited to a controllable level, but even at this level it was strong enough to remove any accumulation of ash in the grate.
A fireman was not always able to match the quantity of steam produced to that required, and when excess steam was produced it had to be eliminated. The blood line, or, maximum allowable steam pressure at which the Klondike's boiler operated was 184 pounds per square inch above which the safety valves came into play. Popping a safety valve by generating too much pressure was not looked upon kindly as the force of the escaping steam cleaned the boiler of sludge and scale and deposited it over the ship's superstructure. The cleaning job that followed such an occurrence was not appreciated by the deck crew. There were times when the requirement for power was such that the safety valve blew continuously, such as the first time the Klondike went upriver through Five Fingers Rapids without lining up. The fireman's penalty for an unjustified popping of the valve, however, was a bottle of rum for the crew.

When the steam pressure began to build, there were several ways to get rid of it other than through the safety valves. The least used was simply to allow it to escape into the atmosphere. This was a waste of steam which was really unnecessary. Another more frequently used method was to employ the steam to operate the siphons that eliminated any water that had accumulated in the bilges. There was always excess steam available when the vessel was ready to leave and it was especially at such times that the siphons
were engaged. As with all controls for which the firemen were responsible, the ones that operated the siphons were located near the stokehold.

To try to make the steam supply match the need, the firemen worked as closely as possible with the engineers. Many engineers provided the firemen with a landing list, thereby giving them advance warning of those times the ship would alter its steam requirements. Direct communication was available between the engine room and the stokehold by a speaking tube through which the fireman was informed of any changes. No direct communications between the wheelhouse and stokehold were possible; however, cables connecting the telegraph in the wheelhouse with the telegraph in the engine room passed near the stokehold, and the movement of those cables alerted the firemen to a possible change in steam requirement. Steam was also required when the steam winch was engaged to line up through the rapids; such times were known in advance and hence could be accommodated.

The quantity of wood consumed depended on the amount of steam required, which varied according to whether the vessel was going upstream, downstream, through rapids, and also on which fireman was on duty. On the downstream run the Klondike burned from half to three quarters of a cord per hour, which doubled when the return trip up stream was made. In theory, one pound of wood evaporates two and one half to
three and a half pounds of water. At a combustion rate of one cord an hour, and assuming 3000 pounds of wood in a cord, approximately 144 gallons of water would be converted to steam each hour. The fire box had a maximum capacity of one and a half cords of wood which gives some indication as to the amount of work required to keep the steam pressure constant. Although the box could hold this amount of wood, the quantity actually in place when firing was determined solely by the fireman. Some of the stokers preferred to fire with a full fire box, using the blower to obtain the required quantities of air necessary for efficient combustion. The combination of a full fire box, with the wood extended over the fire wall, and the draft action of the blower, resulted in a large amount of unburned material being pulled through the stack, which caused excessive clogging of the fire tubes, thereby reducing the boiler's efficiency and creating more work to keep the tubes clear. It is said that the expert fireman generally had the box only half full with the larger wood on the outside and the smaller on the inside which was said to result in maximum thermal efficiency.

Having to move a cord of wood per hour in an area that was far from ideal, the firemen followed certain precautions. Some firemen wore a canvas sleeve over their forearms and gloves on their hands to protect themselves from the wood and the hot boiler face. Other firemen
rejected these protective devices as they considered them inherently dangerous. The wood was never straight and generally had stubs of former branches sticking out at right angles. These could and did catch on the protective gloves and sleeves, causing at times the loss of a glove in the box, and at other times a severe burn to the fireman as he was pulled toward the face of the boiler by the momentum of the thrown log. Because the positioning of the wood in the fire box was crucial, most firemen wore a solenoid vizor through which they viewed the interior of the box since to look into the fire box without protection when the door was open was painful.

The fireman, who had enough to do keeping the boiler fired, was not expected to move his own wood to the stokehold area. Part of each deck hand's job was to spend one to one and three quarter hours in the AM and again in the PM moving wood from where it was stowed to the stokehold.

A fireman's job consisted of more than keeping the boiler fed with wood, he also was expected to keep the boiler in good running order. Every morning the tubes had to be blown, which was the job of the lead fireman. This operation got rid of the accumulated silt in the boiler which if allowed to build up could damage the boiler severely. Even a minor accumulation of silt reduced the boiler's efficiency. This was normally done at wood stops,
the silt being blown into the bilges to the dismay of the
deck hands whose job it was to clean out the bilges.\textsuperscript{139}
The firetubes also had a tendency to accumulate soot that
reduced the boiler's efficiency. One way of removing the
soot is by dry steam at high pressure, which may have been
done on the \textit{Klondike}.\textsuperscript{140} The normal method used on the
\textit{Klondike} was to run the punching gear through the tubes.
The rods used to punch the tubes looked like 12 foot long
bottle brushes with metal bristles. Sufficient space had to
be left behind the boiler when the ship was being loaded so
that the tubes could be punched.\textsuperscript{141} Another arduous
task, which was performed at Dawson every second trip, was
washing the boiler. The fire would be pulled when the
boiler had to be washed and the boiler allowed to cool,
after which the water was drained. Once empty and cool
enough, the boiler was cleaned, scale was removed and the
braces and stays were checked.\textsuperscript{142}

\textit{Notwithstanding the care that was lavished on the}
boiler, it was subject to breakdown, with the major problem
being leaky tubes. Most small leaks generally sealed
themselves after 10 to 12 hours of hard firing.\textsuperscript{143} Some
could not be ignored, however, and had to be stopped until
permanent repairs could be effected in Whitehorse. This was
generally done by closing off the fire tube(s) where the
break had occurred. There was only one way to do this and
that was to plug the tube at both ends. Access to the aft
end of the boiler through the doors used to punch the tubes was relatively simple; however, such was not the case with the forward end which was inside the fire box. The fire had to be pulled and the boiler cooled down. The unfortunate crew member who volunteered his services to go into the fire box to plug the tube clad himself in several layers of clothing to get as much protection as possible. A rope was then tied around his waist and he entered the fire pit and stood on a board which had been placed onto the fire brick at the bottom of the fire box just prior to his entrance. The crew member would have only enough time for a couple of hard blows at the plug, after which he would probably have been overcome by the heat. Even in this short space of time, the plank upon which he was standing would have started to burn where it touched the fire box. The whole operation of placing the plug in the leaky tube in the fire box, from start to finish, probably took no longer than a minute.144

Deck Crew
With the exception of the deckboy the deck crew's focus of operation was the main deck. This segment of the ship's complement worked under the direction of the first and second mates.145 The deck hands were on 24 hour call, and during especially difficult periods or busy times were expected to work as many hours as required. They were,
however, paid overtime rates for any hours put in beyond their normal watches. The annual turnover of deck hands was high, in part because the work was unskilled and arduous, and possibly because the deck hands enjoyed less status than the firemen.146

The deck hands were responsible for a variety of tasks. In Whitehorse they worked along side the longshoremen, getting the ship loaded up as quickly as possible, which might take up to eight hours of back breaking work. Much of the freight had to be wheeled on hand trucks the length of the freight sheds and the full length of the vessel. After clearing Whitehorse the deck hands were expected to sort and stow freight that had not been done in port, and to do a general clean up of the freight deck.147 During the trip, the deck hands unloaded and loaded freight at each waystop and loaded the required wood fuel at the wood stops. Each one of the deck crew was responsible for a two hour wood watch in each 12 hour period that required moving the wood fuel from where it was stowed on deck to the stokehold for the fireman who was stoking the boiler.148

In addition to the above tasks the deck hands were called upon to perform other duties. The most common of these entailed handling the cable while lining up through the various rapids. If a rudder or paddle wheel bucket was lost or damaged they might also be called upon to help repair or replace it. The situation that required the most
work resulted from the vessel grounding on a sand or gravel bar. This might not happen at all during a season, or it might happen several times depending on river conditions. The deck hands in this latter case did the physical labour involved in sparring or placing a deadman on shore so that the vessel could pull itself off, or, in particularly severe cases unloading the vessel to reduce its draft.

The deck hands' quarters were located aft of the engine room, that is between the engine room and the transom. Four men shared a room and there were two rooms allotted to the deck crew, berthing seven deck hands and a deckboy. Even though these quarters were located in the aft rather than the forward section of the boat, the crew referred to this area as the fo'c's'le, a transfer of terminology from sailing vessels where the crew was housed in the forecastle. Each cabin contained two sets of bunk beds, with storage room for clothes and little else. As the deck hands lived in close quarters, requirements for cleanliness were, needless to say, high. The cabins were used for little else other than sleeping, and as the watches were staggered, someone was generally asleep in the cabin at any time of the day or night. All other activities were generally carried out on the freight deck. The deck crew, along with the firemen, had to get used to the noise of the engines and the paddle wheel in order to sleep, and one former deck hand recalled that he found it difficult to
adapt to the quiet of his own bedroom after the end of the navigation season.\textsuperscript{151} The crew sometimes displayed pinup pictures on the bulkheads; however, these were generally restricted to the bulkheads in the washroom areas aft the crews' quarters.\textsuperscript{152} Photographs of girl friends and wives were generally kept out of sight with the men's personal effects.

Although hard working, the ship's complement did have time off. Tension which might build up because of the close proximity of one person to another, and the limited space on board to which the deck hands had access could lead to practical jokes which tended to relieve potentially serious situations.\textsuperscript{153} Even during spare moments there were functions that had to be fulfilled. The men were responsible for washing their own clothes which, depending on how this was done, could have disastrous results. The soap used was a strong lye soap called 'Sugy' powder. There is more than one story of men having put their clothes in a bucket of water with sugy powder, and coming back at some later time to find only those parts of the garment that were impervious to the action of a strong lye soap.\textsuperscript{154} Clothes worn by the deck crew although sturdy, being mostly work shirts, heavy socks and denim pants, did require mending and one generally found that each crew member had his own little box containing the required needles, thread and buttons.\textsuperscript{155} Appearances had to be kept up, especially for those periods
when there was sufficient time, such as when the boiler was being cleaned,\textsuperscript{156} to enjoy what Dawson or Whitehorse offered. To this end, there was generally someone on board who was willing, for a price, to cut other crew members' hair.\textsuperscript{157} Free time on board was generally spent playing cards for money on the freight deck, reading books or magazines if one were so inclined, writing letters, or reading mail from home which was obtained when the vessel landed in Whitehorse.\textsuperscript{158}

Liquor appears not to have been a general problem on board the vessels. This is not to say that crew members did not get inebriated every once in a while, especially when they were given time off in port. At such times one crew member may have covered for one under the weather during a watch; however, as the work was strenuous, such lapses were not looked upon with kindness.\textsuperscript{159}

It was not always possible or maybe even desirable to fill the deck crew with people from outside the Yukon and at such times the company turned to the indigenous Indians. One possible reason for turning to natives for the deck crews was that they could be picked up along the river when needed and discharged when the need had passed. Such an arrangement was viewed favourably by both parties: the company did not have to pay for men it did not need and saved the cost of transporting non Yukoners into and out of the territory, and the Indians regarded the arrangement as a
way of making money without having to sign on for a full season. Some mates considered the local Indians to be better workers than many of the white crew members, and hence tried to use them as much as possible. However, long term employment tended to be the exception rather than the norm since many Indians worked only long enough to obtain a certain amount of money and would then disappear until they needed more. Problems occasionally arose from the close quarters of the crews' accommodation, and the different standards of personal hygiene,

One individual member who was considered part of the deck crew but who had distinct duties to perform, was the deckboy. The deckboy rose before 5 in the morning and followed a loosely scheduled pattern for the rest of the day. One of his first duties was to bring coffee to the wheelhouse, after which he was expected to hose down the decks to get rid of the preceding night's accumulation of cinders and grime from the boiler. The process of hosing down the decks was done periodically throughout the day, using a hose that could be connected to the various fire hydrant risers located strategically on the various deck levels. It was also the responsibility of the deckboy to clean the wheelhouse, clean out the air tight heater located there and keep it supplied with wood. The cleaning of the wheelhouse occasionally required more than simply taking care of the heater and sweeping the floor, for
if a particularly rough passage had been made with Captain Coghlan at the controls, the degree of difficulty could be measured by the height of the tobacco juice up the side of the bulkhead in the vicinity of the spitoon.\textsuperscript{166} Other minor jobs the deckboy was expected to perform included running up the various flags, blowing the half hour whistle, oiling the tillers and in general doing any odd jobs that were required.\textsuperscript{167} Aside from what was noted above, the deck boy's general responsibility was to keep the exterior of the ship clean.\textsuperscript{168}

Cabin Crew

The cabin crew was mainly responsible for the passengers' and officers' comfort and needs. These crew members' functions can actually be divided into two; their jobs as waiters and their duties as cabin stewards.

The cabin crew generally started work at 6 AM, readying the dining room for breakfast and continued, with various breaks, throughout the day until 9 PM. Preparation for breakfast involved removing the heavy green table covers that had been put on the tables the night before, and setting the tables with the appropriate cover and dishes. Tablecloths were obtained from the linen locker which on the Klondike was located aft of the dining room. The dishes were brought from the galley, and the cutlery and glasses from the waiters' station which also was located at the aft
end of the dining area, and separated from it by a curtain. The station contained a table on which the waiters cut pies, and washed the cutlery and glassware in a slop pail.\textsuperscript{169} The cutlery was stored in a table drawer. The station was conveniently located near the galley dutch door, through which dishes for the main courses were passed to the waiters.

The dining tables had already been assigned to the passengers by the purser, and on the Klondike there were generally two sittings for all meals. A menu was provided for every meal, giving approximately four to five selections for breakfast and a more limited selection for the other meals. The menus were varied from day to day. It was up to each waiter, who was given a number of tables to look after, to decide how much personal service he wanted to give the passengers. Extra service could result in larger tips, which were an important supplement to his wage. Once the meal was finished the tables would be cleared, and only then would the waiters sit down to eat, after which the tables would be set for the next meal; however, if it was the last meal of the day, the tables would have the heavy table covers put on them again so that they could be used for recreation by the passengers.\textsuperscript{170}

After breakfast, a waiter's role changed to that of cabin steward; and off came the white shirt, bow tie and waiter's jacket with the removeable buttons, most of which
was supplied by the company, and on went ordinary work
denims and work shirts. Once in a cabin the cabin
steward would do as follows: make the bed(s) or change the
linen, depending on whether the boat was on the river, in
port, or if there were a change in occupancy; sweep the
carpet; clean the glasses and fill the water jug. Soiled
and used materials such as towels and soap were
replaced. All of the material necessary for the
rooms was obtained from the linen locker which, in the
Klondike's case, was on the Texas deck. The soiled linen
would be exchanged for clean bundles in Whitehorse every
trip. The commode pail below the sink also had to be
emptied, which gave rise to the term "P.P. parade", the
meaning of which will be left to the reader. In other
words, the cabins were cleaned.

The cabin stewards were also responsible for the
officers' cabins. This was one of the few occasions when a
steward could repay or voice an opinion about an officer by
leaving the door of the cabin open once he had finished his
work, thereby allowing a host of insects access to those
quarters.

The accommodations for the cabin crew were better than
the deck crew and firemen as they were quartered on the
Klondike in staterooms on the saloon and Texas decks. These
staterooms were the regular two bunk type; however, they
were generally hog post or hog chain staterooms, that is
they had one of those members running through it. These staterooms were not as crowded as those occupied on the main deck, nor were they close to the noise of the paddle wheel or engines.

Galley Crew

The galley crew comprised a number of people who were ranked in a sort of hierarchy. Starting from the low end of the scale there was the mess boy, pantryman, second cook and chief cook. The main responsibility of the galley crew was to prepare the food to be consumed by the crew and passengers. Each level of the hierarchy in the galley had its own duties to perform. The mess boy peeled the vegetables which, depending on the number of people on board, could be quite a chore. He also looked after the crew in the crew's mess, taking their orders for food and serving them. After the cooking and eating had been completed, the mess boy washed all of the pots and pans that had been used for that meal. The pantry man, whose domain was the forward part of the galley, distributed the food over the bottom half of the dutch door to the waiters in the dining room. He also prepared all of the salads, shrimp cocktails and mayonnaise. All of the actual cooking and baking was done by the cooks, each one of which may have had his own specialities such as pastry or pressed hams.
The galley crew worked long hours which often stretched from five in the morning to seven or eight at night. Although there was no overtime pay, wages of the galley crew were higher than those of the deck crew; the mess boy, for example, made 10 dollars more per month than a deck hand. Moreover, all of their white clothing and the laundering thereof were supplied by the company. There were also other compensating factors that supplemented their income. Waste food was a saleable commodity along the river. The grease drippings and fat renderings were stored in gallon and four gallon cans. Bakestuffs left over from the passengers' tables were put into burlap bags and also saved. Both of the above mentioned areas were within the cooks' domain. Actual table scraps and waste food was put into four gallon cans and stored in the vegetable locker or on the freight deck by the mess boy. All of the above were sold to the Indians along the way with the grease and baked stuffs probably being sold for the best prices, as they were still consumable commodities, whereas, the scrap food was sold as dog food for about 50 cents a can.

The galley crew occupied staterooms on the saloon deck, and, as was the case with the cabin crew, these cabins probably had a hog chain or hog post going through them.
Passengers

The first Klondike (1929) was built with minimal passenger accommodation. Designed essentially as a freight carrier, she was intended to serve on the Whitehorse-Stewart Landing run. Indeed, during her first year on the river she did not travel to Dawson. For these reasons the Klondike did not maintain a "schedule", as did other vessels, such as the Casca and Whitehorse, which were locked into the arrival and departure times of coastal ships calling at Skagway.\(^1\)

However, even in 1928, it had been foreseen that the Klondike might eventually be converted to a passenger ship and the design of the vessel was such that the various decks could be so extended aft to accommodate such a change.\(^2\)

Additional cabins were added to Klondike I in 1934, and Klondike II had berths for 32 passengers. The fact that the main function of both Klondikes was to carry freight did not mean that the passengers that did sail on her were treated any differently from those carried on the other British Yukon Navigation Company vessels.

When the freight had been loaded in Whitehorse, the passenger gang plank was inserted between the stanchions of
the saloon deck on the Klondike as on all the other riverboats to allow the boarding of passengers. The number of passengers that the Klondike II was allowed to carry according to its licence appears to have varied from year to year. The D.O.T. records show that between 1940 and 1949 the maximum allowable passenger load ran from a low of 72 in 1942 to a high of 77 for the years of 1946 to 1949. Although not specified, these figures most certainly include first and second class passengers. The file for 1944 indicates that 32 of those numbers were designated first class passengers, that is passengers who could be berthed in staterooms, and can only assume that the remaining passenger load allowed must have been for second class passengers or deck passengers not using overnight accommodations. Whether the 32 remained constant in the above noted time frame or also varied as did the total is not known. A former master of the Klondike, W. Bromley, noted that on average the number of passengers carried when the Klondike was not carrying cargo that precluded passengers was 50. This number would mean, if the above noted assumption of 32 cabin passengers is correct, that about a third of the passengers would either be second class passengers or way passengers moving from one point on the river to another. In 1950 new fire regulations, brought in through an Order in Council P.C. 1896, dated 12 April 1950, reduced the allowable passenger load of the Klondike to 25 first class and 25
second class. The year 1950 also saw the installation of four additional cabins to the Texas deck cabins. This should have meant more passenger berths. The reduction of passenger berths to 25 appears to indicate that these additional cabins were meant for the crew and not the passengers. Whatever the case may have been the Klondike's conversion to cruise ship increased the passenger berths to 50 through the construction of crew quarters on the freight deck which was no longer being used for that purpose, thereby freeing their former cabins located on the upper decks to passengers. Besides the increase in passenger berths the number of day trip passengers allowed, which was first noted in the inspection report of 1950, was held at 125 for 1954 and increased to 150 in 1955.5

The conversion of the Klondike to cruise service, effected in 1954, did mean a certain regularization of service. The conversion was done in conjunction with Canadian Pacific Airlines who were to provide sufficient passengers for 10 round trips in the summer.6 The venture was found to be not successful and was terminated after two years.

Accommodations on board the Klondike, prior to the vessel's conversion to a cruise vessel, could be termed spartan. The staterooms had the barest necessities in them. They contained the following: bunks and bedding, a chair, towelling, possibly a carpet, a wash basin and mirror above
it, drinking water in a carafe, two water glasses, life belts below the bunk with instructions on how to use them on one of the bulkheads, clotheshooks, a shelf and a rack on the bulkhead to hold one's personal possessions. There was no plumbing in any of the staterooms, and any water used had to be brought there by one of the waiters. Once this water had been used, it was collected in a commode pail located below the open effluent pipe of the sink. These commode pails were occasionally used for a night time convenience, possibly because unlike the Whitehorse and Casca the Klondike does not appear to have had chamber pots. The furnishings of a stateroom were, according to all information, certainly quite adequate for what they were intended, namely to supply a passenger a sleeping place and privacy for, at the most, three nights.

As had been stated, there was originally no running water in any of the staterooms. Hot and cold running water was provided in the various washrooms. For those passengers who desired more water than what was provided in the carafes in the staterooms, water barrels with a spigot near the bottom were strategically located, usually by the companionways, on both the forward saloon and boat decks. The fact that the water for the washrooms was taken directly from the river could at times be bothersome for those taking baths as the grit content of this water could be quite high. The problem of grit in the bath water
was partially alleviated by placing a bath towel in the bottom of the tub once the sediment had settled.  

Housekeeping practices on the passenger decks were similar to any summer hotel of the time. The rooms were cleaned out every morning by the cabin stewards; that is the beds were made, the water glasses changed, the commode pails emptied, the carpets swept, and, if there was a change of passenger or if port was reached, the rooms would be given a complete change of linen and towelling. 

Cabin comfort, depended to a large degree upon the weather. The spring and the fall could be quite cold, and as there were no heaters in the cabins, one would expect that most passengers would spend a considerable part of the journey in the dining room and observation lounge where heat was provided. Eiderdowns were only provided to the officers of the vessel. During the summer months the heat could be quite oppressive, and even with the screened doors and windows left open, there must have been very little, if any, cross ventilation. The passenger staterooms were, therefore, largely exposed to the vagaries of external temperatures. 

Security for those passengers occupying staterooms was minimal. Even though the cabin doors could be locked up, no purser ever remembers assigning keys to any of the passengers. There appears to have been no fear of anything being stolen from the vessel or its passengers.
Probably the main reason why theft was not a problem on the vessels was that there was really nowhere to go with one's booty, as all passengers would have to pass through two good check points, Dawson or Whitehorse, to leave the country, or take their chances in the Yukon wilderness, which is not a very appealing prospect for the uninitiated.

The quality of accommodation for the passengers changed very little through the years of the vessel's operation, even after conversion. There is little evidence presently available to indicate that changes, besides the addition of the Texas deck cabins, occurred prior to the ship's conversion to cruise service. The difficulty lies in trying to distinguish alterations made in that year from those that may have come before. Whatever the case, the life of the passenger was made somewhat more comfortable in the last two years of the Klondike's operation. Plumbing was installed throughout the vessel, providing hot and cold running water to every stateroom. Heating may also have been provided at that time. The actual furnishings of the cabins, however, do not appear to have changed, and so the stateroom still presented a spartan and confined atmosphere. The greatest change to passenger comfort was in the common areas of the vessel. The addition of the bar-lounge, through the extension of the saloon deck housing aft, must have made the trip along the river much more comfortable and enjoyable. Changes were also effected to the dining room and
observation room; fortunately very little is known of these alterations. From the few photographs available of the above areas, it appears that "fancier" lighting fixtures were attached, and an attempt was made to change the decor through the addition of the photographic panels on the dining room bulkheads. The Klondike never was a luxurious vessel, as her main function was as, freighter, and even after its alterations to cruise ship the luxuries that were provided appear to have been restricted to the public areas of the vessel.

Even though the staterooms had the barest of necessities, this did not mean that a passenger's stay on board was something that had to be endured. There were many diversions available to the traveller on the Klondike. Information as to what was available or what was coming up, such as shuffleboard, quoits, badminton, a raffle or card game, was generally posted on the bulletin board outside of the purser's office. Quoits, shuffleboard and badminton were generally played on the open area of the aft saloon deck; a shuffleboard court was laid out thwartships just aft the saloon deck housing; a net for badminton was slung between the hogposts if the open space was available; the quoit pegs were placed anywhere there was an open space. The raffle, which might be run either by the chief steward or the purser, was often for a Hudson's Bay blanket, the price of the ticket being determined by the number of
passengers on board. Card tournaments were occasionally organized. The games were generally played on the dining room tables once these had been cleared. Organized activities were not restricted to competitions or raffles. If sufficient interest were shown by the passengers, a dance could be held on the freight deck, using a tarpaulin sprinkled with cornstarch as the dance floor and a gramaphone as a source of music. Time was another factor in determining what diversions would or could be offered passengers. Both gold panning and fishing required that the vessel tie up to the shore. When time and a suitable location such as Domville Bar were available, the passengers could be given fishing lines with bacon as bait, and allowed to prepare their catch, which was usually grayling, up in the galley for their own consumption. Again, if time were available, the vessel might tie up somewhere four to five gold nuggets could be planted by the purser in a set area along the shore such as Goddard Point on Lake Laberge and a competition would be held among those interested passengers to see who could find the nuggets, with the winners being allowed to keep their loot.

The activity that probably occupied most of the passengers' time was sight-seeing from both inside the vessel and out. The scenery to be viewed along the river is captivating. The company put out a booklet noting the places of interest along the river, thereby allowing the
passengers to trace the progress of the vessel. All of this could be viewed from any external area of the ship, with wicker and wooden chairs being provided for this activity, or if there were inclement weather from inside the observation lounge where the passengers were provided with a more than 180 degree view of the river. Included in the continuously changing scenery, was a variety of wildlife such as cariboo, moose and bear, which the ship's crew went out of their way to show the passengers if such were spotted.  

The vessel and its associated activities were prime targets for the inquisitive passenger. Passengers were generally allowed to view the vessel's operation as long as they did not get in the way. If time and conditions allowed, a passenger might be invited up to the wheelhouse to view the operation from there, and might even be allowed to "steer" the vessel in a calm section of the river or on Lake Laberge, as Prince Philip did when he was taken for an excursion on the Klondike. Although the wheelhouse was usually out of bounds to the passengers, such was not the case with the freight deck and all of the activities that were performed there. The engine room, with its two compound condensing engines driving the pitman arms, must have held a certain fascination for many passengers. The stokehold, where the fireman would be working and feeding the boiler with an average of one cord of wood per
hour, also drew the passengers' attention. Here, as with the wheelhouse, a number of passengers were allowed to participate; however, in this case work was more manual and possibly dangerous for the hot face of the boiler was not something that could be ignored or treated with disrespect. There were also the actions involved with lining up through the rapids and of docking along the way stops on the river that could catch the passengers' attention. Then, of course, there were those trips when the vessel grounded, which provided passengers with an opportunity to observe the ceaseless activities involved in the placement of the spars or a deadman needed to free the vessel.

There were also those quieter moments when passengers were left to their own devices. At such times they may have read whatever was provided on board or what they themselves had bought. They may also have used such times to write letters or post cards; the materials for both could have been obtained from the purser. A writing desk with lamp was provided on the forward panel of the stack housing in the observation lounge.²¹ Besides reading and writing there were also the general conversations one could have with fellow travellers.

The company tried to make the passengers' stay on board as pleasant as possible; however, there were a number of discomforts that could not be avoided. Some of these, such as uncomfortable temperatures have already been dealt with.
Bad language by the crew could, for the most part, be controlled by the officers responsible, and it may have been, under some circumstances, quite understandable to those who overheard it. The more pervasive nuisance during the Yukon summer was the bugs, with the mosquito and blackfly vying with each other for the title "pest of the year." The only recourse a passenger had to cope with the swarms of bugs that hovered outside the vessel was citronella, which apparently was used quite liberally by some passengers. One's stateroom might not offer escape from the ever present bug menace since the cabin steward might have inadvertently left the screen door open, as he was wont to do at times with some of the officer's cabins.

Deck fare passengers, who might account for more than half of the travellers carried on any one trip, were not afforded the opportunity of escaping the ever present attacks of the bug hordes, or, for that matter, most other discomforts. Available to them as sleeping accommodations were single or two tier bunks lashed to one of the stanchions at the aft end of the freight deck, or if they preferred they could sleep on the freight deck as most of the Indians were likely to do. No women were allowed to sleep down on the freight deck; they had to be accommodated in staterooms. Second class passengers were restricted to the freight deck and the aft end of the
saloon deck, as the dining room and forward lounge and promenade were off limits to them. It seems doubtful that such passengers were allowed to partake of the various organized activities. Their meals, if they chose to take them on board, which many did not, were eaten in the crews' mess, both before and after the crew had eaten.26 The food they ate was the same as that served to everyone else on board. These passengers were restricted to using the crews' washrooms, which were located aft of the crew's quarters on the freight deck.27 As a good percentage of such deck fare passengers were simply going a short distance, some of the discomforts indicated above were probably not even noticed.

The majority of deck fare passengers were local inhabitants travelling from point to point along the river. The Indians used the riverboats to get themselves and their belongings upriver, whereas on the downriver run they relied mainly on their own small craft. They did not generally have an exact idea of the schedule that the vessels ran on the river, but simply flagged down the first boat that came along after their decision to move had been made. They transported everything they owned which included dogs, boats and even hot food that they might have been cooking when the vessel came along. The Indians generally carried their own bedding and simply used the freight deck as a sleeping platform.28
Rowdyism among the second class passengers was not unknown, particularly where miners going for a night on the town or native people who had imbibed too much were involved. Most of these problems could be easily handled by the deck crew. For any passenger who could not be controlled through persuasion, the trip on the vessel was shorter than what had been planned on, as the offenders would be dropped off at the nearest settlement or encampment.

The provisions available to the company for the vessels were certainly equal to those provided to any restaurant or hotel of comparable size. The only limiting factors, as far as the food was concerned, were the quality of provisions purchased by the company, the adequacy of preservation equipment and the skill of the people who prepared the meals.

Baked goods, having for the most part a very short shelf life, were made on board. Bread, pies and cookies were baked each day according to requirements. This did not mean that manufactured goods such as Ormond's Tea Biscuits, which have a relatively long shelf life, were not carried. Bread was probably the most consistent item produced daily in the bakeshop with 16 loaves being about the normal quantity required on board the Klondike. Pies were only limited by the types of fillings that could be obtained which, for the most part, were of the canned variety. The
cookies that were offered seem to have been similar to those made in most homes: peanut butter, coconut, oatmeal, raisin, and macaroons. This home-baked goods approach appears also to have been reflected in the brownies, date squares and the various types of date loaves offered. Depending upon individual skills, some cooks also produced fancier pastries for both the passengers and crew.29

Desserts did not consist only of baked goods. Various fresh and canned fruit were available. The greatest treat on board, as far as some crew members were concerned, was the home-made ice cream that was produced on board the vessel in a two gallon ice cream maker.30

The production of meals on board, although made difficult by the small quarters allowed for the galley and lack of adequate refrigeration, was not hindered by lack of variety in food. Vegetables, both canned and fresh, were readily available. The fresh vegetables were grown locally around Dawson, and when not in season were imported from the "outside." The canned goods were, for the most part, stored in the pantry and the fresh vegetables in a vegetable locker cooled by ice located just aft of the saloon deck housing on the Klondike. The meat probably suffered the most from the lack of adequate refrigeration facilities on board. The meat on the Klondike was stored in a meat locker that sat on the saloon deck up against the transom. This location had been chosen to take advantage of the cool water spray that
was thrown up by the paddlewheel. The major source of cooling was provided by blocks of ice. Even with the ice present, meat, after it has sat in the locker for a week in the heat of summer, did, at times, have to be treated with vinegar before it could be consumed. Preservation was aided by the fact that most of the meat that was placed in the locker entered it in a frozen state. There was also, besides frozen meats, some fresh meats such as cariboo, moose and fish which was obtained locally. The meat that the locker contained, was as varied as that found in any moderate-sized meat counter today.\textsuperscript{32}

Dairy products, kept in an oversized ice box located on the aft saloon deck directly by the galley door, suffered equally from the lack of adequate refrigeration.\textsuperscript{33} Fresh milk was not carried and those on board had to rely on canned Pacific Milk.\textsuperscript{34} The fact that the Yukon had very few cows to produce fresh milk was probably also a contributing factor. The lack of fresh milk also meant that butter in its salted form had to be imported from the "outside." Chickens were also a rare commodity in the north and most, if not all, of the eggs used on board came north in a cold pack and were at times of low quality.\textsuperscript{35}

The soups that were served appear to have presented little problem. Stocks for most soups were carried on board, some probably in cans.\textsuperscript{36} The only difficulty concerning soups could have been the quality of the water
which had to be obtained from the river; however, a good supply of cooking water was stored in barrels on the aft saloon deck to be used at those times when the river water was not useable.\textsuperscript{37}

The passengers were served at tables in the dining room which on the \textit{Klondike} was located directly aft of the observation lounge and forward of the galley. This was the same area in which the officers took their meals. There is some confusion as to the seating arrangements. That the officers were seated at a long table appears to be fairly certain; however, whether passengers used a similar table in addition to smaller ones, is not clear.\textsuperscript{38} The passengers certainly did use small round tables, seating four each. The tables were set with what could be best described as heavy cafeteria-style dishes, distinguished by a few simple green bands.\textsuperscript{39} The silverware was of standard restaurant quality some of which may have had the company monogram on the handles.\textsuperscript{40} The table settings rested on the linen table cloth with the company monogram in the center. These table cloths and the linen napkins were kept in a small closet or locker just aft of the waiters' station at the aft end of the dining room. The table, when set, had on it, besides the cutlery and dishes, various condiments such as ketchup, H.P. sauce, salt and pepper and sometimes a dish of celery and green olives.\textsuperscript{41} Attempts were also made to brighten up the dining area through the
inclusion of flowers on the tables and various plants in tin hangers hung from the deckhead frames.

Once the passengers were seated at the tables in the dining room, they were in the hands of the waiters. The choice of food that was available to them was indicated by a menu, that had been prepared by the chief steward in conjunction with the chief cook, and it usually included five major items. Once the passenger's choice had been made, this would be conveyed to the pantry man, whose job it was to fill the order from the prepared food in the galley. The plates containing the individual servings were handed back to the waiters over the top of the lower half of the dutch door that separated the galley from the dining area. The waiters generally doled out the desserts in individual servings, on the table located in the waiter's station aft of the dining room and demarcated from it by a curtain. The amount of personalized service a waiter gave to any of the passengers was left completely up to the individual, and probably depended upon the likelihood and size of the tip that might have been forthcoming.43
Conclusion

There appears to be some debate as to whether or not the river operation prior to the 1950s was at all profitable. Some former crew members felt that the Klondike at least, because of its cargo capacity of 300-350 tons, must have made some money for the company. But this view does not take into account those years when there was little freight to be shipped from the mines, or those years during WWII when the Klondike appears to have spent more time on the skidways than in the water. When the large quantities of freight were not there, money had to be obtained from the passenger trade and the smaller riverboats with larger passenger capacity, such as the Casca and Whitehorse were used instead. The general consensus, therefore, has to be on the side that the river operation was at least marginally profitable and certainly necessary for the survival of the Yukon.

It is difficult without a full set of financial records to make any definitive comment about the economic viability of the river division. What must be taken into account, however, is the fact that the river division did not operate
in isolation, but was a necessary part of a tightly integrated transportation system that extended down to Seattle and Vancouver. For the system to function all of segments, whether it be the ships coming up the coast, the railway over the White Pass or the vessels on the river had to be operational, and any cost analysis would have to take into account the whole transportation network and not one isolated aspect of it.

One may be able to judge the company's view of the physical assets of the river division by whether or not the riverboats were insured. The argument is that if a substantial amount of money was made off of this sector, actions would probably have been taken to protect it and conversely if it was marginal at best the extra cost of insurance may have pushed it into the red, thereby becoming a cost which the company may not have been able to absorb. Insurance appears to have been carried on cargo, but only that originating in Seattle bound for Skagway. A former crew member thinks that the fact that a man was kept on guard at the riverboat moored at the lower end of Lake Laberge during the winter would indicate that insurance was probably carried. It would seem more likely, however, that the guard on the steamer was more than likely kept there to keep vandals off during the winter months. No conclusive evidence has as yet been found that would indicate that the ships were in fact insured and statements by certain company officials appear to indicate that they were not.\(^5\)
The death blow to the river division was of course the road development that occurred during and after the war, allowing 12 month movement of goods instead of the five or six allowed by the river. Those who view the demise of riverboats as being due to a change of presidents upon Wheeler's retirement cannot be supported, especially if the assertion that the river division was marginal even at the best of times is true. The fact that an attempt was made to continue the river division through the inauguration of a cruise ship service, namely a converted Klondike which cost an additional $100,000, must be viewed as a serious attempt by the company to keep at least one steamer operating. This attempt to continue the river division does not, however, address itself to the question of whether or not this last attempt was handled properly. Some feel that the failure of the cruise service was due not to lack of interest or viability but to too few passenger staterooms and poor co-ordination and merchandising by both the Canadian Pacific Airlines and the B.Y.N. Co. Whether or not the cruise service was viable is in the final analysis a moot point for with the opening of the all weather road allowing twelve month movement of freight and tourists, the main financial source which had sustained the river division was gone and the riverboats were doomed to pass into history as they had in so many other areas of Canada and the U.S. over the previous hundred years.
Appendix A

**Ship's Company**
The list of crew members that follows cannot be considered to be complete. This list was derived from ship's articles and crew lists which are only available until 1945. There are some names excluded of people who served subsequent to that date. These were, however, derived from steamship inspection reports which unfortunately only note masters, pilots and engineers and not those who served in other capacities. Even in the time frame covered, the list is probably not definitive as it probably does not take into account temporary assignment in times of need.

Various abbreviations were used in the list, most of which were obvious. There were some for which no explanation could be found.

- D.H. - deckhand
- S.T. - (single trip)
- R.T. - (round trip)
- C.L.B. - (not known)
- ni - (not known)
- N/T - (trip north)

**Appendix A**

<table>
<thead>
<tr>
<th>Year</th>
<th>Age</th>
<th>Position</th>
<th>Length of Employment</th>
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<td>Baker</td>
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</tr>
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</tr>
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<td>D.H. (Workaway) $1.00/m.</td>
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</tr>
<tr>
<td>Name</td>
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<td>D.F. Bacon (Can.)</td>
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<td>28</td>
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<td>16</td>
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<td>Year</td>
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<td>1930</td>
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<td>H. Brown (Can.)</td>
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<td>Chas. Brufalt (Sweden)</td>
<td>44</td>
<td>1930</td>
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* appointed Master—Sept. 26/46 on account of sickness, Cap’n Cogltan.

(May 31st)
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<td>trip</td>
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<td>D.H.</td>
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<td>H.A. Carmichael (Can.)</td>
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<td>58</td>
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<td>J. Chamberlain (Can.)</td>
<td>28</td>
<td>1940</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>Season</td>
</tr>
<tr>
<td>Edward Charlie (Native)</td>
<td>19</td>
<td>1946</td>
<td>D.H.</td>
<td>$95</td>
<td>Season</td>
</tr>
</tbody>
</table>
George Charlie (Can.)
21 1929 Deck Hand $60/m. R.T.

Eric Christen (Can.)
35 1946 Messman $105/m. Season
1946 Pantryman $130/m. Season

H. Christmas (Can.)
34 1946 D.H. $95/m. Trip

T.P. Christmas (Can.)
24 1946 D.H. $95/m. Trip

M.S. Clarke (Eng.)
54 1934 Pantryman $76.50/m. R.T.

C.M. Coghlan (Can.)
55 1929 Master $300/m. Season
   1930 Master $300/m. Season
   1933 Master $270/m. R.T.
   1934 Master $270/m. Season
   1935 Master $285/m. Season
   1936 Master $300/m. Season
   1937 Master $300/m. Season
   1938 Master $300/m. Season
   1939 Master $300/m. Season
   1940 Master $300/m. Season
   1942 Master $300/m., C.L.B. Season
   1943 Master $300/m., C.L.B. Season
   1944 Master $320/m. Season
   1945 Master $320/m. Season
   1946 Master $320/m. Season

F. Coghlan (Can.)
52 1930 Stewardess $1/m. S.T.
   1930 Stewardess $1/m. S.T.

Frank I. Coghlan (Can.)
18 1938 D.H. $60/m. R.T.
   1939 D.H. $60/m. R.T.
   1940 D.H. $60/m. Season

Melvin Constable (U.S.A.)
12 1942 Asst. Steward $50/m., C.L.B. R.T.

John Copethorne (Ireland)
21 1930 Waiter $60/m. R.T.

Charles Corrigan (Can.)
44 1930 2nd Engineer $250/m. Season
   1937 2nd Engineer $250/m. Season
A.G. Courguin (Can.)
43  1939 Extra Pilot $200/m. Season
    1940 Ex. Pilot $200/m. Season

Robert John Cox (Scotland)
  84  1930 Waiter $60/m. R.T.

M.D. Crerar (Can.)
  26  1936 Baker $100/m. R.T.
    1937 Chief Cook $140/m. R.T.
    1939 Cook $140/m. R.T.

Neil Crerar (Can.)
  33  1939 Workaway $1/m. S.T.

Bill Cronkkite (Can.)
  15  1946 Messboy $85/m. Season

A. Cunningham (Can.)
  21  1939 Workaway $1/m. S.T.

C.H. Cunningham (Can.)
  58  1946 Frt. Clerk $170/m. Season

L. Cyr (Can.)
  14  1934 Pantry Helper $50/m. R.T.

D

Victor Danielson (U.S.A.)
  53  1946 Workaway $130/m. Trip
    Stewards Dept.

J.M. Davidson (Scotland)
  44  1935 Pantryman $80.75/m. R.T.
    1936 Pantryman $85/m. R.T.
    1937 Pantryman $85/m. R.T.

George Dawson (Can.)
  27  1929 D.H. $60/m. R.T.

Gerald Day (Can.)
  29  1946 Fireman $120/m. Season

A.H. DeBastien (Can.)
  30  1943 D.H. $75/m. Season

Joe de Caluivé (Eng.)
  51  1937 Waiter $60/m. Season
    1942 Waiter $60/m., C.L.B. R.T.
<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Year</th>
<th>Position</th>
<th>Rate</th>
<th>Notes</th>
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<tr>
<td>E.H. Decerr (British)</td>
<td>57</td>
<td>1935</td>
<td>2nd Cook</td>
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<td>Russell Denny (Can.)</td>
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<td>1942</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>C.L.B. Season</td>
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<td>B.J. Devlin (Can.)</td>
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<td>$60/m.</td>
<td>R.T.</td>
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<td>William De Wolf (Can.)</td>
<td>33</td>
<td>1943</td>
<td>D.H.</td>
<td>$75/m.</td>
<td>C.L.B. Season</td>
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<td>Peter Diach (Can. - Winnipeg)</td>
<td>27</td>
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<td>C.L.B. Season</td>
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<tr>
<td>Stanley Divers (Can.)</td>
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<td>D.H.</td>
<td>$75/m.</td>
<td>Season</td>
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<td>C.J. Doheny (Can.)</td>
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<td>1946</td>
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<td>1946</td>
<td>2nd Mate</td>
<td>$185/m.</td>
<td>Season</td>
</tr>
<tr>
<td>J.N. Douglas (Scot.)</td>
<td>69</td>
<td>1945</td>
<td>Niteman</td>
<td>$105/m.</td>
<td>Season</td>
</tr>
<tr>
<td>M. Douglas (Eng.)</td>
<td>68</td>
<td>1943</td>
<td>Night Man</td>
<td>$85/m.</td>
<td>C.L.B. Season</td>
</tr>
<tr>
<td>Vincent Doyle (Can.)</td>
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<td>1944</td>
<td>Waiter</td>
<td>$185/m.</td>
<td>Season</td>
</tr>
<tr>
<td>W. Drseren (Can.)</td>
<td>22</td>
<td>1929</td>
<td>D.H.</td>
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<td>R.T.</td>
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<td>D. Duff (Scot.)</td>
<td>67</td>
<td>1946</td>
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<td>R.H. Dunbar (Can.)</td>
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<td>1945</td>
<td>Fireman</td>
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<td>Season</td>
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<tr>
<td>J.E. Dunn (Can.)</td>
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<td>James Easby (Eng.)</td>
<td>35</td>
<td>1942</td>
<td>Pantryman</td>
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<td>C.L.B. Season</td>
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<tr>
<td>Name</td>
<td>Age</td>
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<td>Position</td>
<td>Salary/Rate</td>
<td>Notes</td>
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<td>G.D. Edwards (Can.)</td>
<td>201</td>
<td>1945</td>
<td>Purser</td>
<td>$205/m.</td>
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<tr>
<td>J.A. Elliott (Can.)</td>
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<td>R.T.</td>
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<td>J.J. Elliott (Irish)</td>
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<td>2nd Engr.</td>
<td>$250/m.</td>
<td>Season</td>
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<td>1933</td>
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<td>$225/m.</td>
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<tr>
<td>H. Farher (Can.)</td>
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<td>1939</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<td>1940</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>Season</td>
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<tr>
<td>C.M. Farguhar (Can.)</td>
<td>20</td>
<td>1933</td>
<td>Messman</td>
<td>$63/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1934</td>
<td>Messman</td>
<td>$63/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>J.H. Faught (Can.)</td>
<td>33</td>
<td>1944</td>
<td>Waiter</td>
<td>$1.05</td>
<td>Season</td>
</tr>
<tr>
<td>James Findlay (Can.)</td>
<td>21</td>
<td>1940</td>
<td>Fireman</td>
<td>$85/m.</td>
<td>Season</td>
</tr>
<tr>
<td>Clifford Fisher (U.S.A.)</td>
<td>15</td>
<td>1942</td>
<td>Asst. Steward</td>
<td>$60/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>Wm. O. Flaherty (Can.)</td>
<td>22</td>
<td>1939</td>
<td>Waiter</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>Ormond W. Fleming (Can.)</td>
<td>18</td>
<td>1942</td>
<td>Waiter</td>
<td>$60/m., C.L.B.</td>
<td>Season</td>
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<tr>
<td>John G. Ford (Scotland)</td>
<td>52</td>
<td>1937</td>
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<td>$250/m.</td>
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<td>Season</td>
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<td>1939</td>
<td>2nd Eng.</td>
<td>$250/m.</td>
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<td>2nd Eng.</td>
<td>$250/m.</td>
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<td>$320/m.</td>
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<td>Chf. Engl</td>
<td>$320/m.</td>
<td>Season</td>
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<tr>
<td>Jack Forde (Can.)</td>
<td>28</td>
<td>1938</td>
<td>Purser</td>
<td>$150/m.</td>
<td>Season</td>
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<td>Purser</td>
<td>$150/m.</td>
<td>Season</td>
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<td>Purser</td>
<td>$150/m.</td>
<td>Season</td>
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<td>1942</td>
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<td>$150/m., C.L.B.</td>
<td>Season</td>
</tr>
<tr>
<td>Name</td>
<td>Age</td>
<td>Year</td>
<td>Position</td>
<td>Salary</td>
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<tr>
<td>P.M. Forrest (Can.)</td>
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<td>1938</td>
<td>Workaway</td>
<td>$1/m.</td>
<td>S.T.</td>
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<tr>
<td>R.J. Fowler (Can.)</td>
<td>19</td>
<td>1946</td>
<td>Waiter</td>
<td>$105/m.</td>
<td>Season</td>
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<tr>
<td>L.G.H. Fox (Can.)</td>
<td>20</td>
<td>1933</td>
<td>D.H.</td>
<td>$55/m.</td>
<td>R.T.</td>
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<tr>
<td>John A. (Jack) Fraser (Can.)</td>
<td>13</td>
<td>1946</td>
<td>Messboy</td>
<td>$85/m.</td>
<td>Season</td>
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<tr>
<td>J.P. Frieman (Eng.)</td>
<td>59</td>
<td>1934</td>
<td>Chf. Cook</td>
<td>$126/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td></td>
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<td>1935</td>
<td>Chf. Cook</td>
<td>$133/m.</td>
<td>R.T.</td>
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<td></td>
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<td>1936</td>
<td>Chf. Cook</td>
<td>$140/m.</td>
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<tr>
<td>W. Garden (Eng.)</td>
<td>22</td>
<td>1940</td>
<td>Fireman</td>
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<td>Season</td>
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<tr>
<td>C.E. Gardiner (Eng.)</td>
<td>42</td>
<td>1942</td>
<td>Purser</td>
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<td>J.A. Gardner (Can.)</td>
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<td>Pilot</td>
<td>$270/m.</td>
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<td></td>
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<td>Season</td>
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<tr>
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<td>64</td>
<td>1945</td>
<td>Pilot</td>
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<td>Season</td>
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<tr>
<td>P. Garson (Sweden)</td>
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<td>1929</td>
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<tr>
<td>Joe Garvon (Can.)</td>
<td>73</td>
<td>1942</td>
<td>Workaway</td>
<td>$1/m.</td>
<td>S.T.</td>
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<tr>
<td>Peter Gebtaith (Can.)</td>
<td>33</td>
<td>1944</td>
<td>D.H.</td>
<td>$95/m.</td>
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<tr>
<td>W.H. Gec (Eng.)</td>
<td>67</td>
<td>1943</td>
<td>Chief Cook</td>
<td>$175/m., C.L.B.</td>
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<td>1944</td>
<td>Chf. Cook</td>
<td>$195/m.</td>
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<tr>
<td>J. Gillan (Scotland)</td>
<td>27</td>
<td>1934</td>
<td>Frt. Clerk</td>
<td>$55/m.</td>
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<tr>
<td>C.A. Gillespie (Eng.)</td>
<td>37</td>
<td>1942</td>
<td>D.H.</td>
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<td>Hector Godin (Can.)</td>
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<td>$80.75/m.</td>
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<tr>
<td>Name</td>
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<td>Position</td>
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<td>Fred Good (Can.)</td>
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<td>Fireman</td>
<td>$120/m.</td>
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<td>56</td>
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<td>S. Gorton (Can.)</td>
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<td>T.R. Gough (Can.)</td>
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<td>$76.50/m.</td>
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<tr>
<td>K. Grant (Can.)</td>
<td>23</td>
<td>1934</td>
<td>D.H.</td>
<td>$55/m.</td>
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<tr>
<td>Vito Greeco (Italy)</td>
<td>52</td>
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<td>R.O. Greenius (Can.)</td>
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<td>J.P. Greenwood (Eng.)</td>
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<td>61</td>
<td>1936</td>
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<tr>
<td>T.L. Gurfador (France)</td>
<td>45</td>
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<tr>
<td>T.M. Hagen (U.S.A.)</td>
<td>48</td>
<td>1946</td>
<td>Waiter</td>
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<td>one way to Circle</td>
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<td>Alec Halkett (Can.)</td>
<td>18</td>
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<td>$55/m.</td>
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<td>D.H.</td>
<td>$55/m.</td>
<td>R.T.</td>
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<td>$170/m.</td>
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<td>J. Hamilton (Can.)</td>
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<td>R.T.</td>
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<td>R.T.</td>
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<tr>
<td>J. Harbottle (Can.)</td>
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<td>R.T.</td>
</tr>
<tr>
<td>Name</td>
<td>Age</td>
<td>Year</td>
<td>Position</td>
<td>Pay 1</td>
<td>Pay 2</td>
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<tr>
<td>C. Harison (Can.)</td>
<td>64</td>
<td>1939</td>
<td>Workaway</td>
<td>$1</td>
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<tr>
<td>Chas. Harris (Eng.)</td>
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<td>1938</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<td>1939</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>Thomas B. Harrison (Eng.)</td>
<td>46</td>
<td>1930</td>
<td>Chief Cook</td>
<td>$140/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>F. Hart (Can.)</td>
<td>27</td>
<td>1942</td>
<td>Waiter</td>
<td>$60/m.,C.L.B. Season</td>
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</tr>
<tr>
<td>W. Heleapeau (?) (Scot.)</td>
<td>33</td>
<td>1937</td>
<td>D.H.</td>
<td>$1/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>Art Hempell (Germany)</td>
<td>29</td>
<td>1935</td>
<td>Messman</td>
<td>$66.50/m.</td>
<td>R.T.</td>
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<tr>
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<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>Joseph Henry (Can.)</td>
<td>42</td>
<td>1942</td>
<td>ni</td>
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<td>1943</td>
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<td>Percy Henry (Can.)</td>
<td>16</td>
<td>1943</td>
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<td>Ft. Yukon to Dawson Season</td>
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<td>Peter Henry (Can.)</td>
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<td>F.C. Herron (Can.)</td>
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<td>L.M. Hill (Can.)</td>
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<td>1946</td>
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<td>C.R. Hogg (Can.)</td>
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<td>Season</td>
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<td>R.M. Hoggan (Can.)</td>
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<tr>
<td>Name</td>
<td>Age</td>
<td>Year</td>
<td>Position</td>
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<td>K. Hoever (Can.)</td>
<td>69</td>
<td>1939</td>
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<td>R. Holland (Eng.)</td>
<td>38</td>
<td>1934</td>
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<td>$1/m.</td>
<td>S.T.</td>
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<td>John Hoochi (Can.)</td>
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<td>Workaway</td>
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<td>R.T.</td>
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<td>E.J. Howell (Can.)</td>
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<td>J. Huhotson (?) (Can.)</td>
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<td>1930</td>
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<td>Charles Isaac (Native)</td>
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<td>Duke Isaac (Can.)</td>
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<td>Trask Johnston</td>
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<td>Roddy B. Jack (Native)</td>
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<td>L. Stan Jackman (Can.)</td>
<td>28</td>
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<td>George Jak (Can.)</td>
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<td>$60/m.</td>
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<td>Alf. E. James (Australian)</td>
<td>64</td>
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<td>Chief Steward</td>
<td>$185/m.</td>
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<tr>
<td></td>
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<td>C/Steward</td>
<td>$205/m.</td>
<td>Season</td>
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<td>Chas. James (Eng.)</td>
<td>36</td>
<td>1929</td>
<td>Workaway</td>
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<td>S.T.</td>
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<tr>
<td>Name</td>
<td>Age</td>
<td>Year</td>
<td>Position</td>
<td>Salary</td>
<td>Type</td>
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<td>M.A. James (Can.)</td>
<td>25</td>
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<td>Walter James (Can.)</td>
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<td>1930</td>
<td>Waiter</td>
<td>$60/m.</td>
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<td>James Johnnie (Can.)</td>
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<td>J. Jonathon (Can.)</td>
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<td>D.H.</td>
<td>$75</td>
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<td>C.E. Jones (Eng.)</td>
<td>56</td>
<td>1937</td>
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<td>$60/m.</td>
<td>Season</td>
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<tr>
<td>F.I. Jones (Can.)</td>
<td>20</td>
<td>1943</td>
<td>Fireman</td>
<td>$100/m., C.L.B.</td>
<td>Season</td>
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<td>Herbert E. Jones (Eng.)</td>
<td>67</td>
<td>1946</td>
<td>Ch. Steward</td>
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<td>Season</td>
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<td>M. Kalenak (Can.)</td>
<td>24</td>
<td>1946</td>
<td>Fireman</td>
<td>$120/m.</td>
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</tr>
<tr>
<td>I. Kazinsky (Can.)</td>
<td>26</td>
<td>1934</td>
<td>D.H.</td>
<td>$1/m.</td>
<td>S.T.</td>
</tr>
<tr>
<td>Andrew M.A. Keay (Can.)</td>
<td>18</td>
<td>1933</td>
<td>D.H.</td>
<td>$55.00</td>
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<td>D.H.</td>
<td>$55/m.</td>
<td>R.T.</td>
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<td>D.H.</td>
<td>$57.50/m.</td>
<td>R.T.</td>
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<td>1936</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<td></td>
<td>1937</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<td>1938</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>Sid Keay (Can.)</td>
<td>24</td>
<td>1933</td>
<td>D.H.</td>
<td>$55/m.</td>
<td>R.T.</td>
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<tr>
<td></td>
<td></td>
<td>1934</td>
<td>D.H.</td>
<td>$55/m.</td>
<td>R.T.</td>
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<tr>
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<td>1935</td>
<td>D.H.</td>
<td>$57.50/m.</td>
<td>R.T.</td>
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<td>1936</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
</tr>
<tr>
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<td>1937</td>
<td>2nd Mate</td>
<td>$125/m.</td>
<td>Season</td>
</tr>
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<td>1938</td>
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<td>$125/m.</td>
<td>Season</td>
</tr>
<tr>
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<td>1939</td>
<td>2nd Mate</td>
<td>$125/m.</td>
<td>Season</td>
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<td>1940</td>
<td>1st Mate</td>
<td>$150/m.</td>
<td>Season</td>
</tr>
<tr>
<td>Bill Keillor (Can.)</td>
<td>19</td>
<td>1942</td>
<td>D.H.</td>
<td>$60/m., C.L.B.</td>
<td>Season</td>
</tr>
</tbody>
</table>
John W. Kelly (Scotland)
  48  1930  Baker  $100/m.  R.T.
  1930  Messman  $70/m.  R.T.

Paul Kelly (Can.)
  -  1942  Fireman  $85/m.  R.T.

E. Keoblse -  
  22  1929  Oiler  $1/m.  R.T.

B.W. King (Eng.)
  54  1938  Pantryman  $85/m.  R.T.
  1945  Pantryman  $130/m.  Season

Bennie Kingwell (U.S.A.)
  16  1937  Messboy  $50/m.  R.T.

W.M. Knudson (Can.)
  20  1946  Fireman  $120/m.  Season

H. Koshevoy (Can.)
  19  1929  Messman  $70/m.  R.T.

M. Kurncy (Russia)
  56  1942  Ch. Cook  $140/m., C.L.B. Season

L

F.Y. LaGure (Ireland)
  45  1934  Waiter  $55/m.  R.T.

Geo. (G.S.) Landen (Eng.)
  34  1933  Sec. Cook  $90/m.  R.T.
  34  1934  Sec. Cook  $90/m.  R.T.

Lucien Larente (Can.)
  22  1946  Workaway  ni  ni

(F. Lawrence) -
  -  1929  Chief Cook  $140/m.  R.T.

A.R. Le Page (U.S.A.)
  30  1936  D.H.  $1/m.  N/T

D.H. LePage (Can.)
  20  1929  Purser  $150/m.  Season
  1930  Purser  $150/m.  Season

W. Lesyek (Polish)
  32  1940  D.H.  $60/m.  Season
<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Year</th>
<th>Position</th>
<th>Salary</th>
<th>Duration</th>
</tr>
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<tbody>
<tr>
<td>C.J. Lieuwen (Holland)</td>
<td>31</td>
<td>1933</td>
<td>D.H.</td>
<td>$55/m.</td>
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</tr>
<tr>
<td>A. Lindstrom (Sweden)</td>
<td>63</td>
<td>1936</td>
<td>D.H.</td>
<td>$1/m.</td>
<td>N/T</td>
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<tr>
<td>D. Lloyd (Can.)</td>
<td>20</td>
<td>1930</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>W.L. Lloyd (Can.)</td>
<td>17</td>
<td>1944</td>
<td>D.H.</td>
<td>$95/m.</td>
<td>Season</td>
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<td>F.D. Locke (Can.)</td>
<td>28</td>
<td>1930</td>
<td>Deck Hand</td>
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<td>Scotty Jock Lon (Can.)</td>
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<td>Ross S. Lord (Can.)</td>
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<td>Henry Lougheed (Can.)</td>
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<td>19</td>
<td>1940</td>
<td>Messman</td>
<td>$70/m.</td>
<td>Season</td>
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<tr>
<td>G. Macaulay (Scot.)</td>
<td>30</td>
<td>1929</td>
<td>Tinsmith</td>
<td>$1/m.</td>
<td>R.T.</td>
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<td></td>
<td></td>
<td></td>
<td>(Fireman)</td>
<td></td>
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<tr>
<td>M. Macaulay (Scot.)</td>
<td>35</td>
<td>1933</td>
<td>1st Officer</td>
<td>$135/m.</td>
<td>R.T.</td>
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<td></td>
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<td>1934</td>
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<td>R. MacDonald (Can.)</td>
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<td>D.H.</td>
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<td>Donald MacLean (Scot.)</td>
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<tr>
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<td>Salary</td>
<td>Employment Type</td>
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<tr>
<td>1937</td>
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<td>R.T.</td>
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<tr>
<td>1938</td>
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<td>R.T.</td>
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<tr>
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<td>R.T.</td>
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<td>R.L. Macready (Can.)</td>
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<tr>
<td>1935</td>
<td></td>
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<td>R.T.</td>
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<td></td>
<td>Grant Macpherson (Can.)</td>
<td>Waiter</td>
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<td>R.T.</td>
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<td>1929</td>
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<td>Robert L. Magee (Can.)</td>
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<td>A. March (Can.)</td>
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<td>William Maruk (Can.)</td>
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<td>$85/m., C.L.B.</td>
<td>Season</td>
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<tr>
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<td>A.S. Martin (Can.)</td>
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<td>Trip</td>
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<tr>
<td>1946</td>
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<td>Howard Martin (Can.)</td>
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<td>1946</td>
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<td>L. Menegas (Greece)</td>
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<td>David Mervyn (Native)</td>
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<td>Harry S.H. Metcalf (Can.)</td>
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<td>-</td>
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<td>Bruce F. Meyers (U.S.A.)</td>
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<tr>
<td>Name</td>
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<td>Position</td>
<td>Salary</td>
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<td>S.J. McCallen (Can.)</td>
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<td>-</td>
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<td>H.A. McClelland (Can.)</td>
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<td>D.H.</td>
<td>$95/m.</td>
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<td>Gordon McDonald (Can.)</td>
<td>19</td>
<td>1942</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>C.L.B. Season</td>
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<td>A.J. McDonald (Can.)</td>
<td>45</td>
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<td>D.H.</td>
<td>$1/m.</td>
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<tr>
<td>J. McDonald (Scot.)</td>
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<td>1943</td>
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<td>$300/m.</td>
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<td>J.L. McDonald (Can.)</td>
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<tr>
<td>C. McEwan (Can.)</td>
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<td>1944</td>
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<td>1 trip</td>
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<td>Sterling McGrath (U.S.A.)</td>
<td>21</td>
<td>1929</td>
<td>Waiter</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>W. McGregor (Eng.)</td>
<td>54</td>
<td>1933</td>
<td>Pantryman</td>
<td>$76.50/m.</td>
<td>R.T.</td>
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<td></td>
<td>54</td>
<td>1934</td>
<td>Chf. Steward</td>
<td>$135/m.</td>
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<td>Chf. Steward</td>
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<tr>
<td>Taylor McGurdy (Can.)</td>
<td>23</td>
<td>1929</td>
<td>D.H.</td>
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<td>C. McInnes (Can.)</td>
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<td>Wm. McIntosh (Scot.)</td>
<td>28</td>
<td>1929</td>
<td>Oiler</td>
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<td>D. McKay (Scot.)</td>
<td>56</td>
<td>1934</td>
<td>Chief Officer</td>
<td>$270/m.</td>
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<td></td>
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<td>Chief Officer</td>
<td>$285/m.</td>
<td>Season</td>
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<td>Chief Officer</td>
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<td>Season</td>
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<tr>
<td>Name</td>
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<td>Year</td>
<td>Position</td>
<td>Salary</td>
<td>Period</td>
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<tr>
<td>G. McKay (Can.)</td>
<td>19</td>
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<td>Messman</td>
<td>$66.50/m.</td>
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<td>B. McKimmie (Can.)</td>
<td>34</td>
<td>1939</td>
<td>Waiter</td>
<td>$60/m.</td>
<td>S.T.</td>
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<tr>
<td>J. McLaren (Scotland)</td>
<td>48</td>
<td>1945</td>
<td>2nd cook</td>
<td>$160/m.</td>
<td>Season</td>
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<tr>
<td>G. McLaughlin (Can.)</td>
<td>46</td>
<td>1944</td>
<td>2nd Cook</td>
<td>$160/m.</td>
<td>Season</td>
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<td>M. McLean (Can.)</td>
<td>27</td>
<td>1937</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td></td>
<td></td>
<td>1938</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>A. McLeod (Scotch)</td>
<td>62</td>
<td>1945</td>
<td>2nd Mate</td>
<td>$170/m.</td>
<td>Season</td>
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<tr>
<td>Clifford McLeod (Can.)</td>
<td>14</td>
<td>1943</td>
<td>D.H.</td>
<td>$75</td>
<td>Season</td>
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<td>16</td>
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<td>S.M. McLeod (Can.)</td>
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<td>1944</td>
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<td>$95/m.</td>
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<td>1945</td>
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<td>$95/m.</td>
<td>Season</td>
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<td>J. McMalon (Ireland)</td>
<td>45</td>
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<td>Fireman</td>
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<td>M.W. McSaraney (Can.)</td>
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<td>$60/m.</td>
<td>R.T.</td>
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<td>1930</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<td>J. Minnius (Can.)</td>
<td>31</td>
<td>1945</td>
<td>Frt. Clerk</td>
<td>$150/m.</td>
<td>Season</td>
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<td>1946</td>
<td>Purser</td>
<td>$205/m.</td>
<td>Season</td>
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<td>F.H. Mitchell (U.S.A.)</td>
<td>22</td>
<td>1939</td>
<td>Waiter</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>J. Mitchell (Eng.)</td>
<td>32</td>
<td>1937</td>
<td>D.H.</td>
<td>$1/m.</td>
<td>N/T</td>
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<tr>
<td>Danny Moran (Can.)</td>
<td>20</td>
<td>1943</td>
<td>Pantryman</td>
<td>$110/m., C.L.B.</td>
<td>Season</td>
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<td>J. Moran (Can.)</td>
<td>19</td>
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<td>Messman</td>
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<td>R.T.</td>
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<tr>
<td>Name</td>
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<td>Position</td>
<td>Salary/Season</td>
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<td>F. Moey (Can.)</td>
<td>62</td>
<td>1940</td>
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<td>B. Molman (Hungary)</td>
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<td>D.H.</td>
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<td>W.I. Moore (Eng.)</td>
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<td>W.J. Moore (Can.)</td>
<td>67</td>
<td>1944</td>
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<td>$205/m. Season</td>
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<td>W.O. Moore (Eng.)</td>
<td>50</td>
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<td>55</td>
<td>Waiter</td>
<td>$60/m. Season</td>
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<td>L.G. Morgan (Can.)</td>
<td>29</td>
<td>1935</td>
<td>Waiter</td>
<td>$57.50/m. R.T.</td>
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<tr>
<td>E. Morrison (Scotch)</td>
<td>60</td>
<td>1945</td>
<td>Pilot</td>
<td>$320/m. Season</td>
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<td>Roy Moutton (Can.)</td>
<td>16</td>
<td>1943</td>
<td>Waiter</td>
<td>$85/m. C.L.B. Season</td>
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<td>H. Mountain (Can.)</td>
<td>24</td>
<td>1930</td>
<td>D.H.</td>
<td>$60/m. R.T.</td>
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<tr>
<td>R. Mountain (Can.)</td>
<td>18</td>
<td>1930</td>
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<td>N. Murdoch (Scot.)</td>
<td>24</td>
<td>1936</td>
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<td>Adam Murmus (Czechoslovakia)</td>
<td>43</td>
<td>1940</td>
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<td>M. Murphy (Ireland)</td>
<td>34</td>
<td>1944</td>
<td>Workaway</td>
<td>$1/m. Season</td>
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<td>Eno. B. Murray (Can.)</td>
<td>27</td>
<td>1945</td>
<td>2nd Mate</td>
<td>$185/m. Season</td>
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<td>F. Murray (Colorado-U.S.)</td>
<td>65</td>
<td>1929</td>
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<td>1930</td>
<td>Pilot</td>
<td>$300/m. Season</td>
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<tr>
<td>W.F. Murray (Can.)</td>
<td>53</td>
<td>1934</td>
<td>Wkaway</td>
<td>nil S.T.</td>
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</table>
H.S. Murs (Can.)
30  1938   Waiter $60/m.  R.T.
    1940   Waiter $60/m.  Season

E.W. Musgrove (Can.)
34  1940   Waiter $60/m.  Season

S. Naughton (Can.)
58  1946   Waiter $105/m.  Season

J.W. Needham (Can.)
23  1943   Asst. Purser $150/m.  Season
    24  1944   Purser $205/m.  Season
    1945   Purser $205/m.  Season

D.E. Negroporte (Eng.)
57  1938   Cook $140/m.  R.T.
    1940   Cook $140/m.  Season

H.R. Nicholson (Can.)
22  1937   Messman $70/m.  R.T.
    1938   2nd Cook $100/m.  R.T.

P. Noe (Can.)
61  1939   Night Man $60/m.  R.T.

A.F. Olsen (Can.)
20  1944   D.H. $95/m.  Season
    21  1945   D.H. $95/m.  Season

Herbert O'Neil (Can.)
37  1942   D.H. $60, C.L.B.  Season
    1943   2nd Mate $150, C.L.B.  Season
    1944   2nd Mate $170  Season

P. Page (Ireland)
50  1933   Chf. Steward $135/m.  R.T.
    1934   Steward $135/m.  Season

Stan Page (Can.)
48  1945   D.H. $95/m.  Season
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<tr>
<th>Name</th>
<th>Age</th>
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<th>Position</th>
<th>Salary</th>
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<tr>
<td>T.G. Page (Eng.)</td>
<td>40</td>
<td>1929</td>
<td>Carpenter</td>
<td>$1/m.</td>
<td>R.T.</td>
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<tr>
<td>R.E. Palmer (Can.)</td>
<td>33</td>
<td>1945</td>
<td>Steward</td>
<td>$105/m.</td>
<td>Season</td>
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<tr>
<td>R. Parker (Can.)</td>
<td>22</td>
<td>1939</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>Charles J. Parsons (Can.)</td>
<td>32</td>
<td>1946</td>
<td>Messboy</td>
<td>$105/m.</td>
<td>Trip</td>
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<tr>
<td>I.A. Pateson (Can.)</td>
<td>52</td>
<td>1943</td>
<td>D.H.</td>
<td>$75/m.</td>
<td>Season</td>
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<td>Floyd Peters (Can.)</td>
<td>18</td>
<td>1943</td>
<td>D.H.</td>
<td>$75/m., C.L.B.</td>
<td>Season</td>
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<td>L. Petrus (Can.)</td>
<td>26</td>
<td>1946</td>
<td>Waiter</td>
<td>$105/m.</td>
<td>Season</td>
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<tr>
<td>Fred Petty (Can.)</td>
<td>23</td>
<td>1929</td>
<td>Deck Hand</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>F.J. Prossur (Can.)</td>
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<td>Messman</td>
<td>$70/m.</td>
<td>R.T.</td>
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<td></td>
<td></td>
<td>1930</td>
<td>Waiter</td>
<td>$60/m.</td>
<td>R.T.</td>
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<td></td>
<td></td>
<td>1933</td>
<td>ni</td>
<td>ni</td>
<td>ni</td>
</tr>
<tr>
<td>F.H.T. Phillips (Eng.)</td>
<td>20</td>
<td>1937</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>Pleauliu (?) (Can.)</td>
<td>50</td>
<td>1946</td>
<td>Messman</td>
<td>$105/m.</td>
<td>Season</td>
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<tr>
<td>M.F. Plym (Can.)</td>
<td>45</td>
<td>1929</td>
<td>Workaway</td>
<td>$1/m.</td>
<td>S.T.</td>
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<tr>
<td>J. Pruward (Eng.)</td>
<td>50</td>
<td>1933</td>
<td>Chf. Cook</td>
<td>$126/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>H. Ralph (Scot.)</td>
<td>58</td>
<td>1936</td>
<td>D.H.</td>
<td>$1/m.</td>
<td>N/T</td>
</tr>
<tr>
<td>Chas. Rees (Eng.)</td>
<td>56</td>
<td>1946</td>
<td>Baker</td>
<td>$160/m.</td>
<td>Season</td>
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<tr>
<td>Nicholas Reganall (Can.)</td>
<td>24</td>
<td>1946</td>
<td>Fireman</td>
<td>$120/m.</td>
<td>Season</td>
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Charles Reid (Can.)
61 1935 Asst. Purser $1/m. S.T.

James Reid (Can.)
21 1943 Fireman $100/m., C.L.B. Season

Sam Reinchen (Can.)
24 1939 D.H. $60/m. R.T.
1940 D.H. $60/m. Season

E.M. Reynolds (Can.)
18 1943 Waiter $85/m., C.L.B. Season

Ted Richards (Can.)
16 1933 D.H. $55/m. R.T.

W. Riding (Eng.)
23 1935 Waiter $57.50/m. R.T.

William W. Riley (Can.)
21 1946 2nd Cook $160/m. Season

D. Ritchie (Can.)
24 1939 Workaway $1/m. S.T.

Frank Rivers (Native)
16 1946 D.H. $95/m. Trip

Jimmy Robert (Can.)
40 1942 Workaway $1/m. S.T.

Arthur Roberts (Can.) (Native)
18 1943 D.H. $75/m., C.L.B. Season
18 1944 D.H. $95/m. Season
1945 D.H. $95/m. Season

Stanley Roberts (Native)
36 1945 D.H. $95/m. Season
1946 D.H. $95/m. Trip

Jas. A. Robertson (Japan ?)
63 1944 Cook $195/m. Season
(probably Jas. A. Robertson (Can.).

Jas. A. Robertson (Can.)
54 1935 D.H. $1/m. S.T.
65 1946 Ch. Cook $195/m. Season

O.L. Robinson (Can.)
20 1936 D.H. $60/m. Season
<table>
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<tr>
<th>Name</th>
<th>Age</th>
<th>Year</th>
<th>Title</th>
<th>Salary/m.</th>
<th>Notes</th>
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<tr>
<td>J.J. Rogers (Can.)</td>
<td>58</td>
<td>1946</td>
<td>Asst. Purser</td>
<td>$1/m.</td>
<td>One way to Circle</td>
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<td>R.B. Roreer (French)</td>
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<td>1930</td>
<td>D.H.</td>
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<td>R.T.</td>
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<td>C.B. Ross (Can.)</td>
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<td>1943</td>
<td>Purser</td>
<td>$185/m.</td>
<td>C.L.B. Season</td>
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<td>Tony Rossi (Italy)</td>
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<td>1942</td>
<td>2nd Cook</td>
<td>$100/m.</td>
<td>C.L.B. Season</td>
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<td>G.C. Round (Can.)</td>
<td>27</td>
<td>1940</td>
<td>Waiter</td>
<td>$60/m.</td>
<td>Season</td>
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<td>A. Rushworth (Can.)</td>
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<td>Season</td>
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<tr>
<td>J. Sandover (Eng.)</td>
<td>43</td>
<td>1944</td>
<td>Waiter</td>
<td>$105/m.</td>
<td>Season</td>
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<tr>
<td>Stephen W. Sansky (Can.)</td>
<td>26</td>
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<td>Season</td>
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<tr>
<td>J.B. Sansom (Can.)</td>
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<td>R.T.</td>
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<td>P. Salmon (Can.)</td>
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<td>R.T.</td>
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<td>L. Salmon (Can.)</td>
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<td>L. Sauder (Can.)</td>
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<td>Season</td>
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<td>W.S. Schell (Can.)</td>
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<td>1944</td>
<td>D.H.</td>
<td>$95.</td>
<td>Season</td>
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<td>Name</td>
<td>Age</td>
<td>Year</td>
<td>Position</td>
<td>Salary</td>
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<td>K. Schellinger (Can.)</td>
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<td>1935</td>
<td>D.H.</td>
<td>$1/m.</td>
<td>R.T.</td>
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<tr>
<td>J. Scotland (British)</td>
<td>44</td>
<td>1929</td>
<td>Chief Eng.</td>
<td>$300/m.</td>
<td>Season</td>
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<td>1930</td>
<td>Chief Eng.</td>
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<td>1933</td>
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<td>$270/m.</td>
<td>R.T.</td>
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<td>1934</td>
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<td>$270/m.</td>
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<td>Chief Eng.</td>
<td>$285/m.</td>
<td>Season</td>
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<td>1936</td>
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<td>$300/m.</td>
<td>Season</td>
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<td>1937</td>
<td>Chief Eng.</td>
<td>$300/m.</td>
<td>Season</td>
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<td>$300/m.</td>
<td>Season</td>
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<td>1939</td>
<td>Ch. Eng.</td>
<td>$300/m.</td>
<td>Season</td>
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<td>1940</td>
<td>Ch. Eng.</td>
<td>$300/m.</td>
<td>Season</td>
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<td></td>
<td>1943</td>
<td>Ch. Engineer</td>
<td>$300/m.</td>
<td>C.L.B. Season</td>
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<td>1944</td>
<td>Ch. Eng.</td>
<td>$320/m.</td>
<td>Season</td>
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<tr>
<td>Henry Scott (Scot.)</td>
<td>20</td>
<td>1942</td>
<td>D.H.</td>
<td>$60/m. C.L.B.</td>
<td>Season</td>
</tr>
<tr>
<td>John Scott (U.S.A.)</td>
<td>23</td>
<td>1934</td>
<td>Wkaway</td>
<td>$55/m.</td>
<td>S.T.</td>
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<tr>
<td>Gus Scurrrey</td>
<td></td>
<td>1929</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>A.R. Shatford (Can.)</td>
<td>28</td>
<td>1938</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>J. Sheean (Eng.)</td>
<td>46</td>
<td>1943</td>
<td>Waiter</td>
<td>$85/m. C.L.B.</td>
<td>Season</td>
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<td></td>
<td>46</td>
<td>1942</td>
<td>Waiter</td>
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<tr>
<td>Henry Sidney (Can.)</td>
<td>20</td>
<td>1929</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>David Silas (Can.)</td>
<td>20</td>
<td>1929</td>
<td>Deckhand</td>
<td>$60/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>J. Slain (Can.)</td>
<td>47</td>
<td>1944</td>
<td>Waiter</td>
<td>$105/m.</td>
<td>Season</td>
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<tr>
<td>Frank Slim (Can.)</td>
<td>35</td>
<td>1933</td>
<td>D.H.</td>
<td>-</td>
<td>S.T.</td>
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<tr>
<td>O. Slim (Can.)</td>
<td>20</td>
<td>1945</td>
<td>D.H.</td>
<td>$95/m.</td>
<td>Season</td>
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<tr>
<td>Watson Smarch (?) (Can.)</td>
<td>18</td>
<td>1929</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>Name</td>
<td>Age</td>
<td>Year</td>
<td>Position</td>
<td>Salary</td>
<td>Employed By</td>
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<tr>
<td>Daniel Smith (Can.)</td>
<td>23</td>
<td>1940</td>
<td>Baker</td>
<td>$100</td>
<td>Season</td>
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<tr>
<td>Frank Smith (Can.)</td>
<td>39</td>
<td>1942</td>
<td>Workaway</td>
<td>$1/m.</td>
<td>S.T.</td>
</tr>
<tr>
<td>George Smith (Native)</td>
<td>27</td>
<td>1946</td>
<td>Workaway</td>
<td>-</td>
<td>Season</td>
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<tr>
<td>G.C. Smith (U.S.A.)</td>
<td>40</td>
<td>1930</td>
<td>D.H.</td>
<td>$1/m.</td>
<td>S.T.</td>
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<tr>
<td></td>
<td></td>
<td>1936</td>
<td>Oiler</td>
<td>$1/m.</td>
<td>N/T</td>
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<tr>
<td>Robert Smith (Scot.)</td>
<td>23</td>
<td>1940</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>S.T.</td>
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<tr>
<td>Rodrick Smith (Can.)</td>
<td>18</td>
<td>1929</td>
<td>D.H.</td>
<td>$60</td>
<td>R.T.</td>
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<tr>
<td>S. Smith (Eng.)</td>
<td>40</td>
<td>1929</td>
<td>2nd Cook</td>
<td>$100/m.</td>
<td>R.T.</td>
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<tr>
<td>W.J. Smith (Can.)</td>
<td>21</td>
<td>1930</td>
<td>Deckhand</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>Rex Somegawa (Japan)</td>
<td>36</td>
<td>1930</td>
<td>Baker</td>
<td>$100/m.</td>
<td>R.T.</td>
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<tr>
<td>R. Spence (Can.)</td>
<td>20</td>
<td>1930</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>J.C. Spring (Can.)</td>
<td>52</td>
<td>1944</td>
<td>Waiter</td>
<td>$105/m.</td>
<td>Season</td>
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<tr>
<td>A. Squirchak (Can.)</td>
<td>21</td>
<td>1943</td>
<td>D.H.</td>
<td>$75/m..C.L.B.</td>
<td>Season</td>
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<tr>
<td>F.D. Stark (Can.)</td>
<td>25</td>
<td>1946</td>
<td>D.H.</td>
<td>$95/m.</td>
<td>Season</td>
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<tr>
<td>Arthur Stevens (Alaska)</td>
<td>38</td>
<td>1943</td>
<td>Pilot</td>
<td>ni</td>
<td>Season</td>
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<tr>
<td>J.W. Stiles (Can.)</td>
<td>21</td>
<td>1943</td>
<td>D.H.</td>
<td>$75/m..C.L.B.</td>
<td>Season</td>
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<td>A.J. Storer (Scot.)</td>
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<td>1929</td>
<td>Waiter</td>
<td>$60/m.</td>
<td>R.T.</td>
</tr>
<tr>
<td>C.H. Storry (Can.)</td>
<td>19</td>
<td>1930</td>
<td>Fireman</td>
<td>$85/m.</td>
<td>R.T.</td>
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</table>
R. Summerfield (Can.)  
20 1930  D.H.         $60/m.    R.T.

Wm. Sutherland (Can.)  
18 1929  Waiter        $60/m.    R.T.

Philip Swift (Can.)  
26 1938  D.H.         $60/m.    R.T.

J.P. Syroid (Can.)  
23 1946  D.H.         $95/m.    Trip

Harry Takinoto (Japan)  
50 1930  Cook         $140/m.    R.T.

Fred Taylor (Can.)  
17 1943  D.H.         $75/m.,C.L.B. Season
18 1944  D.H.         $95 Season

W.D. Taylor (Can.)  
21 1930  Freight Clerk $1/m.    S.T.

D. Teal (Can.)  
24 1946  Messman      $105/m. Season

C. Thomas (Eng.)  
36 1936  Fireman      $1/m.    N/T

R.A. Thomas (Can.)  
53 1945  D.H.         $95/m. Season

G.W. Thomson (Can.)  
23 1933  Waiter       $55/m.    R.T.

John Thompson (Scot.)  
17 1942  D.H.         $60/m.,C.L.B. Season

C.B. Tipping (Can.)  
44 1929  Mate         $150/m. Season
43 1930  Mate         $150/m. Season

David Torry (Native)  
29 1946  D.H.         $95/m. Season

C. Townsend (Can.)  
33 1934  Fireman      $76.50/m. R.T.
33 1935  Fireman      $80.75/m. R.T.
33 1936  Fireman      $85/m. R.T.
33 1937  Fireman      $85/m. R.T.
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<thead>
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<th>Year</th>
<th>Name</th>
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<th>Salary</th>
<th>Notes</th>
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<tr>
<td>1938</td>
<td>Fireman</td>
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<td>1939</td>
<td>Fireman</td>
<td>$85/m.</td>
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<td>R.T.</td>
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<tr>
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<td>E. Tubb (Can.)</td>
<td>D.H.</td>
<td>$60/m.</td>
<td>R.T.</td>
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<tr>
<td>32</td>
<td>1939</td>
<td>D.H.</td>
<td></td>
<td></td>
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<td>L.A. Tucker (Can.)</td>
<td>D.H.</td>
<td>$75/m., C.L.B.</td>
<td>Season</td>
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<tr>
<td>17</td>
<td>1943</td>
<td>D.H.</td>
<td></td>
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<tr>
<td>18</td>
<td>1944</td>
<td>D.H.</td>
<td>$95</td>
<td>Season</td>
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<td></td>
<td>George Van Bibber (Can.)</td>
<td>18 1942</td>
<td>Workaway</td>
<td>$1/m.</td>
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<td>F. Vay (NFLD)</td>
<td>2nd Eng.</td>
<td>$250/m., C.L.B.</td>
<td>Season</td>
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<tr>
<td>60</td>
<td>1942</td>
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<td>F. Vey (NFLD)</td>
<td>2nd Eng.</td>
<td>$270/m.</td>
<td>Season</td>
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<tr>
<td>61</td>
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<tr>
<td>61</td>
<td>1944</td>
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<td>Howard E. Vey (Can.)</td>
<td>21 1939</td>
<td>Pantryman</td>
<td>$85/m.</td>
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<td>1940</td>
<td>Pantryman</td>
<td>$85/m.</td>
<td>Season</td>
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<td></td>
<td>J. Wakefield (Can.)</td>
<td>33 1933</td>
<td>2nd Officer</td>
<td>$135/m.</td>
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<td></td>
<td>1934</td>
<td>2nd Mate</td>
<td>$135/m.</td>
<td>Season</td>
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<td></td>
<td>1935</td>
<td>2nd Mate</td>
<td>$142.50/m.</td>
<td>Season</td>
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<td>2nd Mate</td>
<td>$150/m.</td>
<td>Season</td>
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<td>1938</td>
<td>Extra Pilot</td>
<td>$200/m.</td>
<td>Season</td>
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<tr>
<td>42</td>
<td>1943</td>
<td>Ch. Officer</td>
<td>$300/m., C.L.B.</td>
<td>Season</td>
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<td>1945</td>
<td>Pilot</td>
<td>$320/m.</td>
<td>Season</td>
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<td>A. Walkden (Eng.)</td>
<td>D.H.</td>
<td>$1/m.</td>
<td>S.T.</td>
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<tr>
<td>37</td>
<td>1935</td>
<td>D.H.</td>
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<td>C. Walls (Can.)</td>
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<td>$95/m.</td>
<td>Season</td>
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<tr>
<td>19</td>
<td>1946</td>
<td>D.H.</td>
<td></td>
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<tr>
<td></td>
<td>Fred Walsh (Scot.)</td>
<td>Chief Steward</td>
<td>$150/m.</td>
<td>R.T.</td>
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<tr>
<td>45</td>
<td>1929</td>
<td>Chief Steward</td>
<td></td>
<td>Season</td>
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<td></td>
<td>1930</td>
<td>Chief Steward</td>
<td></td>
<td>Season</td>
</tr>
<tr>
<td></td>
<td>1942</td>
<td>Ch. Steward</td>
<td>$150/m.</td>
<td>Season</td>
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<td></td>
<td>H. Warner (Can.)</td>
<td>Waiter</td>
<td>$105/m.</td>
<td>Trip</td>
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<tr>
<td>64</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Age</td>
<td>Year</td>
<td>Position</td>
<td>Salary/Season</td>
</tr>
<tr>
<td>-----------------------------</td>
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<td>---------------</td>
</tr>
<tr>
<td>H.A. Watts (Can.)</td>
<td>18</td>
<td>1942</td>
<td>ni</td>
<td>ni</td>
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<tr>
<td>Harry Watts (Can.)</td>
<td>18</td>
<td>1943</td>
<td>2nd Cook</td>
<td>$140/m., C.L.B. Season</td>
</tr>
<tr>
<td>Jack Weise (U.S.A.)</td>
<td>16</td>
<td>1930</td>
<td>Waiter</td>
<td>$60/m.</td>
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<tr>
<td>S.T. Wheeler (British)</td>
<td>54</td>
<td>1929</td>
<td>Freight Clerk</td>
<td>$1/m.</td>
</tr>
<tr>
<td>S.J. White (Can.)</td>
<td>34</td>
<td>1946</td>
<td>3rd Eng.</td>
<td>$225/m.</td>
</tr>
<tr>
<td>W. Whitson (Scot.)</td>
<td>21</td>
<td>1940</td>
<td>D.H.</td>
<td>$60/m.</td>
</tr>
<tr>
<td>John Wholley (Can.)</td>
<td>23</td>
<td>1946</td>
<td>Fireman</td>
<td>$120/m.</td>
</tr>
<tr>
<td>I. Wickstrom (Can.)</td>
<td>46</td>
<td>1938</td>
<td>Workaway</td>
<td>$1/m.</td>
</tr>
<tr>
<td>J. Wideski (Can.)</td>
<td>16</td>
<td>1946</td>
<td>Waiter</td>
<td>$105/m.</td>
</tr>
<tr>
<td>J. Wigans (Can.)</td>
<td>19</td>
<td>1946</td>
<td>2nd Cook</td>
<td>$160/m.</td>
</tr>
<tr>
<td>C. Wilander (Can.)</td>
<td>17</td>
<td>1944</td>
<td>Messman</td>
<td>$105/m.</td>
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<tr>
<td>A. Wilcockson (Eng.)</td>
<td>24</td>
<td>1929</td>
<td>Waiter</td>
<td>$60/m.</td>
</tr>
<tr>
<td>S.C. Wilcox (Can.)</td>
<td>30</td>
<td>1944</td>
<td>Fireman</td>
<td>$120/m.</td>
</tr>
<tr>
<td>D.M. Wilson (Can.)</td>
<td>27</td>
<td>1929</td>
<td>Wheelsman</td>
<td>$150/m.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1930</td>
<td>Wheelsman</td>
<td>$150/m.</td>
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<tr>
<td></td>
<td></td>
<td>1933</td>
<td>Purser</td>
<td>$135/m.</td>
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<tr>
<td></td>
<td></td>
<td>1934</td>
<td>Purser</td>
<td>$135/m.</td>
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<tr>
<td>R.A. Wilson (Can.)</td>
<td>20</td>
<td>1940</td>
<td>Waiter</td>
<td>$60/m.</td>
</tr>
<tr>
<td>A.E. Williams (Can.)</td>
<td>57</td>
<td>1944</td>
<td>Pantryman</td>
<td>$130/m.</td>
</tr>
<tr>
<td>Name</td>
<td>Age</td>
<td>Year</td>
<td>Position</td>
<td>Salary / Rate</td>
</tr>
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<td>-----------------------</td>
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<td>--------</td>
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<tr>
<td>W.H. Williamson (Scot.)</td>
<td>60</td>
<td>1942</td>
<td>Asst. Steward</td>
<td>$1/m. S.T.</td>
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<tr>
<td>W. Witheur (Eng.)</td>
<td>49</td>
<td>1930</td>
<td>D.H.</td>
<td>$1/m.</td>
</tr>
<tr>
<td>J.J. Wood (Can.)</td>
<td>34</td>
<td>1946</td>
<td>Messboy</td>
<td>$1/m. Trip</td>
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<tr>
<td>Mrs. J. Wood (Can.)</td>
<td>34</td>
<td>1946</td>
<td>Stewardess</td>
<td>$1/m. Trip</td>
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<tr>
<td>Mike Wood (Native)</td>
<td>32</td>
<td>1943</td>
<td>D.H.</td>
<td>$75/m., C.L.B. Season</td>
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<tr>
<td></td>
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<td>1944</td>
<td>D.H.</td>
<td>$95/m. Season</td>
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<td>1945</td>
<td>D.H.</td>
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<tr>
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<td>1946</td>
<td>D.H.</td>
<td>$95/m. Trip</td>
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<tr>
<td>Frank H. Woodstrike (U.S.A.)</td>
<td>62</td>
<td>1944</td>
<td>Niteman</td>
<td>$1/m.</td>
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<tr>
<td>W. Woolven (Eng.)</td>
<td>41</td>
<td>1944</td>
<td>D.H.</td>
<td>$95/m. Season</td>
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<td>1945</td>
<td>D.H.</td>
<td>$95/m. Season</td>
</tr>
<tr>
<td>Joe Word (Can.)</td>
<td>15</td>
<td>1944</td>
<td>Waiter</td>
<td>$105/m. Season</td>
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<tr>
<td></td>
<td></td>
<td>16</td>
<td>Mess</td>
<td>$105/m. Season</td>
</tr>
<tr>
<td>V. Worley (Can.)</td>
<td>20</td>
<td>1940</td>
<td>D.H.</td>
<td>$60/m. Season</td>
</tr>
<tr>
<td>Marc H. Clarke Wright (Australia)</td>
<td>29</td>
<td>1929</td>
<td>oiler</td>
<td>$1/m. R.T.</td>
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<tr>
<td>F.L. Young (Can.)</td>
<td>39</td>
<td>1934</td>
<td>2nd Eng'r</td>
<td>$225/m. Season</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1935</td>
<td>2nd Eng'r.</td>
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<td>1936</td>
<td>2nd Eng'r</td>
<td>$250/m. Season</td>
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<td></td>
<td></td>
<td>1940</td>
<td>Ch. Eng.</td>
<td>$300/m., C.L.B. Season</td>
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<td></td>
<td></td>
<td>1944</td>
<td>Chief Eng.</td>
<td>$320/m. Season</td>
</tr>
<tr>
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<td></td>
<td>1944</td>
<td>Chf. Eng.</td>
<td>$320/m. Season</td>
</tr>
<tr>
<td>C.H. Yealit (Can.)</td>
<td>15</td>
<td>1944</td>
<td>Waiter</td>
<td>$105/m. Season</td>
</tr>
</tbody>
</table>
Endnotes

Introduction to the Steamboat
1 Louis C. Hunter, Steamboats on the Western Rivers (New York: Octagon Books, 1969), p. 61-180. A much more detailed treatment of riverboat evolution can be found in this excellent history of steamboats. The work deals specifically with navigation on U.S. river systems; however, his detailed explication of the technical evolution of the riverboat is applicable to such vessels that plied Canadian waters. In some sense significant portions of this chapter can be considered as a paraphrase of what L. Hunter has written.

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1 For a succinct account of the history and nature of river transport in the Yukon see James Weppler "The S.S. Klondike, the Last Sternwheeler," Manuscript Report Series No. 91 (Parks Canada, Ottawa, 1962).
4 Canada. Department of Environment, Parks Canada, S.S. Klondike Oral History Project (Hereafter cited as PC, KOH), Howard Perchie Interview, p. 4.
5 PC, C-8400-598, Bostock to Harvey, 18 April 1973. PC, KOH, A. Courquin Interview, p. 23. PC, KOH, B. Bromley Interview.
7 Canada. Ministry of Transport (Hereafter cited as MOT), File Number 9562-188, Wheeler to Richardson, 16 March 1928.
8 YTA, WP&YR, Annual Reports of the River Division, 1928-35.
10 PC, KOH, Steinbeck Interview, p. 122-23.
12 PC, KOH, Bromley Interview.
13 PC, KOH, Keay-Moran Interview, p. 104-5.
14 PC, KOH, Keay-Moran Interview.
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1. PC, KOH, Dunn Interview, p. 8-9.
2. PC, C-8400-598, Perchie to Bennett, 4 November 1973.
4. PC, KOH, Bromley Interview.
5. PC, KOH, Steinbeck Interview, p. 113.
6. PC, KOH, Jones Interview, p. 204.
7. PC, KOH, Smith, Crawford, Jensen Interview, p. 43-45.
8. PC, KOH, Perchie Interview, p. 9-16.
9. PC, KOH, Olsen Interview, p. 67.
10. PC, KOH, Steinbeck Interview, p. 86-87, 90.
11. PC, C-8400-598, Smith to Bennett, 4 June 1974.
12. PC, KOH, Jones Interview, p. 220.
13. PC, KOH, Coghlan Interview, p. 57-58; Farber Interview, p. 93-94; Dunn Interview, p. 8-9.
14. PC, KOH, Perchie Interview, p. 145.
15. PC, KOH, Farber Interview, p. 93-94.
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17 PC, KOH, Smith, Crawford, Jensen Interview, p. 42.
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20 PC, KOH, Smith, Crawford, Jensen Interview, p. 53-54.
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26 PC, KOH, Smith, Crawford, Jensen Interview, p. 5.
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30 PC, KOH, Farber Interview, p. 45; Doheny Interview, p. 34.
31 PC, KOH, Perchie Interview, p. 29.
32 PC, KOH, Jensen Interview, side 2, p. 2; MOT, 9562-188, Rogers to Widsher, 30 January 1941.
33 PC, KOH, Dunn Interview, p. 12-13.
34 PC, KOH, Perchie Interview, p. 73-75, 140; Doheny Interview, p. 29.
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36 PC, KOH, Dunn Interview, p. 10-11; Lesyk Interview, p. 78; Perchie Interview, p. 150; PC, C-8400-598, Smith to Bennett, 14 June 1973. 37 PC, KOH, Perchic Interview, p. 107.
38 PC, KOH, Jones Interview, p. 221.
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68 PC, KOH, JC, Saturday, II, p. 50; Saturday, V, p. 36, 42; Perchie Interview, p. 7-8.
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70 PC, KOH, Bromley Interview, p. 69; JC, Saturday, I, p. 37-38.
71 PC, KOH, JC, Saturday, V, p. 43; Bromley Interview, p. 73; Hogg Interview, p. 9.
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74 PC, KOH, Doheny Interview, p. 60.
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92 PC, KOH, Hogg Interview, p. 24.
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94 PC, KOH, Innes-Taylor Interview, p. 163-164; Forde Interview, p. 19, I.
95 PC, KOH, Keay-Moran Interview; Bromley Interview.
96 PC, KOH, JC, Saturday, V, p. 13.
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98 PC, KOH, Dunn Interview, p. 140.
100 PC, KOH, Forde Interview, p. 14; Dunn Interview, p. 6.
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113 PC, KOH, Forde Interview, p. 7, I; Dunn Interview, p. 53.
114 PC, KOH, AS, 25 June 1975; WSS, I, p. 51; Forde Interview, p. 9-10, I; Forde Interview, p. 18, 20, II; Dunn Interview, p. 138.
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149 PC, KOH, Lesyk Interview, p. 44.
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153 PC, KOH, Farber Interview, p. 69-70.
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42 PC, C-8400-598, Bromley to Bennett, 30 October 1973.
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2 PC, KOH, Bromley Interview.
3 PC, KOH, Perchie Interview, p. 39.
4 PC, KOH, Courquin Interview, p. 20; PC, KO, Gordon Interview, p. 4, 14-15.
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7  PC, KOH, Hogg Interview, p. 158.
8  PC, KOH, Innes-Taylor Interview, p. 179-180.
9  PC, KOH, Bromley Interview.
10 PC, KOH, Gordon Interview, p. 10; PC, KOH, Perchie Interview, p. 72.
Glossary of Terms

abaft: to the rear, behind
amidship: a) in or toward that part of a ship midway between the bow and the stern
b) in or toward that part of the ship midway between the sides
c) in or towards the middle

Back pressure: residual pressure on the exhaust side of a steam-engine piston against which the steam on the intake side must work

berth: a) a place where a ship lies when at anchor or at a wharf
b) a sleeping accommodation that consists typically of a shelf or frame fixed to a wall and is provided with a mattress and bedding

bilge: a) the part of the underwater body of a ship lying between the flat of the ship's bottom and the straight vertical topsides; specifically the point of the greatest curvature
b) the lowest point of a ship's inner hull adjacent to the keelson

block: a wooden or metal case enclosing one or more pulleys, provided with a hook, eye, or strap by which it may be attached to an object, and used to change the direction of motion of the object or, when two or more pulleys are compounded, to change the rate of motion or exert increased force

boiler: the part of a steam generator in which water is converted into steam and which consists usually of metal shills, headers, and tubes that form the container for steam and water under pressure

boiler feedwater: the water pumped into a boiler for conversion into steam, usually consisted of condensed exhaust steam and 'makeup' fresh water treated to remove air and impurities

boiler horsepower: b.h., a unit for measuring the power of a steam boiler, being the equivalent of 34.5 pounds of steam evaporated from and at 100°C per hour
boiler scale: scale, chiefly calcium sulphate, formed on the walls and tubes of a steam boiler. If excessive, it leads to overheating of the metal and ultimate failure.

boiler tubes: steel tubes forming part of the heating surface in a boiler. In water-tube boilers the hot gases surround the tubes; in locomotive and some marine boilers (fire-tube boilers), the gases pass through the tube.

bulkhead: an upright partition separating compartments, such as a partition separating compartments on a ship. It may be watertight, oiltight, gastight or partially open.

bumper: a buffer (as a log or a bundle of rope) suspended down the side of a ship or boat; namely a device for absorbing shock and lessening or preventing damage in collision or impact with another object.

capstan: a machine for moving or raising heavy weights by winding cable around a vertical spindle mounted drum which is rotated manually by bars fitted into sockets in the drumhead or driven by steam or electric power, pawls at the foot of the drum permitting rotation in one direction only.

carvel-built: built with the planks meeting flush at the seam instead of overlapping.

caulk: a) to stop up and make water tight the seams of a boat or ship by driving in tarred oakum or cotton twist or wicking and filling up with a water proofing compound.
b) to stop up and make tight against leakage by forcing in a sealing substance.

caulking iron: a chisel like tool with a concave edge for receiving a (caulking chisel or caulking yarn) and driving it into a seam.

caulking tool.
caulking mallet: a wooden mallet with a very long head used for driving a caulking iron.

clinker built: having the external plank lap jointed.

cock: a faucet, tap, valve or similar device for starting, stopping or regulating the flow of a liquid.
companionway: a ship's stairway running from one deck to another
condenser: a chamber in which steam or water vapour is condensed to water especially for the purpose of reducing back pressure in a steam engine by the circulation or introduction of cooling water, which renders it possible to obtain a greater amount of useful work per pound of steam used; in it a high degree of vacuum is maintained by an air pump; the condensed water was returned to the boiler as boiler feed water
cord: usually a unit of wood equal to a stack 4x4x8 or 128 cubic feet
crib: a) a heavy supporting or strengthening framework b) a form of timber support
cylinder: the tubular chamber in which the piston of an engine or pump reciprocates by the pressure or expansive force of the working fluid; the internal diameter is called the bore, and the piston travel the stroke
davit: a fixed or movable crame that projects over the side of a ship or over the hatchway and is used especially for hoisting ship's boats, anchors, or cargo
deadman: a) a buried log serving as an anchor b) a stout timber or log used as an anchorage
deadweight: a ship's lading including the total weight of cargo, fuel, stores, crew, and passengers
deckhead: the ceiling of a compartment of a ship
donkey boiler: an auxiliary boiler (as one carried aboard ship for use in port)
donkey engine: a small usually portable auxiliary steam, diesel, compressed air, or other engine; one used to power a windlass on shipboard
draught (draft): the depth of water a ship draws especially when loaded
dry ice: trademark used for a substance that consists of solidified carbon dioxide usually in the form blocks, that at -78.5°C changes directly to a gas as it absorbs heat, and that is used chiefly as a refrigerant and coolant
economizer: an apparatus for utilizing heat otherwise wasted; specifically a bank of tubes, placed across a boiler flue, through which the feed water is pumped, being heated by the otherwise wasted heat of the flue gases.

firebox: a chamber as of a steam boiler that contains a fire; that part of a locomotive-type boiler containing the fire; the grate is at the bottom, the walls and top being surrounded by water.

fire-tube boiler: a boiler in which water surrounds the tubes through which hot gases pass from the furnace to the stack.

fo'c's'le: the forward part of a merchantman where the sailors live either under the deck or in a compartment above the deck; in the vessels that plied the Yukon River this term was appropriated for the crews' quarters located at the aft end of the freight deck.

foredeck: the forepart of the main deck of a ship.

galley: the kitchen and cooking apparatus of a ship.

gangplank: a long narrow movable platform or bridge used in entering or leaving a ship.

gland: a) a device for preventing leakage of steam, water, gas, or other fluid past a point; specifically, the movable part of a stuffing box by which the packing is compressed.
b) a device for preventing leakage at a point where a rotating or reciprocating shaft emerges from a vessel containing a fluid under pressure.
c) a sleeve or nut used to compress the packing in a stuffing-box.

hawser: a large rope for towing or mooring a ship or securing it at a dock.

helm: a) a lever or wheel controlling the rudder of a ship for steering; broadly speaking the entire apparatus by which a ship is steered.
b) deviation of the position of the helm from the amidships position.

hog-chain: a chain or tie rod used in a ship to prevent hogging.
hog-frame: a trussed frame extending fore and aft especially in American river and lake steamers, being usually above deck and reaching to the ends to increase longitudinal strength and stiffness and prevent hogging

hogging: a) to cause a ship to bow up in the middle and sag at the ends b) to become curved upwards in the middle like a hog's back; used especially of a ship or its bottom or keel

jack: a portable lifting machine for raising heavy weights through a short distance, consisting either of a screw raised by a nut rotated by hand gear and a long lever, or a small hydraulic ram

jackstaff: a staff which is fixed on the bowsprit cap or in the bow of a ship

keel: a longitudinal timber or series of timbers scarfed together extending from stem to stern along the center or the bottom of a boat, often projecting below the bottom, constituting the boat's principle timber to which the ribs are attached on each side

keelson: a longitudinal structure in the framing of a ship to contribute stiffness, prevent local deformations, and distribute over a considerable length the effect of concentrated loads

king post: a post that supports the cargo booms on cargo ships. The term here has been transposed to the two main hog posts that sit on the ship's centerline

knee: a piece of timber naturally or artificially bent for use in supporting structures coming together at an angle as in the framing and deck beams of a ship

knuckle: the meeting of two surfaces at a sharp angle as in the timbers of a ship

lagging: material, such as asbestos padding or a plaster mixture of asbestos and magnesia, applied for thermal insulation especially around a cylindrical object

lap joint: a joint made by overlapping two ends or edges and fastening them together
lap strake: having overlapping strakes; characterized by the lapping of each strake on the outside of the one beneath it

locomotive boiler: the type of boiler used on steam locomotives; it consists of an internal fire-box at one end of the horizontal cylindrical shell from which the hot gases are led through fire-tubes passing through the water space into the smoke-box at the front of the boiler

log: a daily record of a ship's speed or progress or the full record of a ship's voyage including notes on the ship's position at various times and including notes on the weather and on important incidents occurring during the voyage

mess: a place where food is served

oakum: loosely twisted fiber usually of hemp or jute impregnated with tar or tar derivative (as creosote or asphalt) and used in caulking seams and in packing joints

packing: a) a thin layer or ring of elastic material (as paper, rubber, asbestos, copper) inserted between the surfaces of a flange joint to make it impervious to leakage
b) the material in a stuffing box which prevents leakage

paddlewheel: a wheel used to propel a steamship and originally having long paddles arranged about a hub or shaft end but later having floats or boards on its circumference and revolving in a vertical plane parallel to the ship's length

pawl: a pivoted tongue or sliding bolt on one part of a machine that is adapted to fall into notches or interdental spaces on another part so as to permit motion in one direction and prevent it in reverse as in a capstan or windlass

piston: a sliding piece moved by or moving against fluid pressure and usually consisting of a short cylinder fitting within a cylindrical vessel along which it moves back and forth
pitman: a rigid rod or arm (connecting rod) that transmits power from one reciprocating motion of a machine to one rotating part; in the case of the paddlewheel the power is transmitted from the reciprocating pistons of the steam engines to the rotating crank of the paddlewheel

port: the left side of a ship looking forward

rudder: a flat piece or structure of wood attached upright to a rudderpost so that it can be turned causing the ship's head to turn in the same direction because of the resistance offered to the water by the rudder. The Klondike had two sets of rudders; the main rudders located forward of the paddlewheel and a set of monkey rudders positioned aft of the paddlewheel

safety valve: an automatic escape or relief valve (as for a steam boiler) held shut by an arrangement exerting a definite and usually adjustable pressure so that the valve will lift and the steam can escape when the pressure exceeds a predetermined amount

shipwright: a carpenter skilled in ship construction and repair

skidway: a number of beams on which a small ship is constructed, repaired or stored

skiff: a light row boat

slough: a side channel or inlet

snatch block: a block that can be opened on one side to receive the bight of a rope

sound: to measure the depth of the water being traversed by a vessel

spar: a stout rounded typically solid piece of wood

sparring: to move or assist a stranded ship with a spar or spar and tackle

stanchion: a supporting post, that is an upright bar, post, prop, brace, or support

starboard: right side of the ship looking forward

stateroom: a room on shipboard or in other words a cabin

steam cock: a cock for passage of steam

steam siphon: a channel through which water passes as if in a siphon
stem: a piece of timber to which the sides of a ship are united at the fore end with the lower end scarfed to the keel

stern: the after or rear end of a ship

stokehold: a space in front of the boilers of a ship from which the furnaces are fed

strake: a continuous band of hull planking or plates on a ship

tackle: an assemblage of ropes and pulleys arranged to gain mechanical advantage for hoisting and pulling

transom: on the riverboats this term was applied to the aft end of the vessel exclusive of paddlewheel and its supporting structures

trim: to cause a ship to assume a desirable position in the water by the arrangement of ballast, cargo, or passengers

vent: an opening or hole for the escape or passage of air

winch: a powerful machine having one or more barrels or drums on which to coil a rope, cable, or chain for hauling or hoisting: windlass

wings: the part of the freight deck of a ship that is nearest the sides.
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White Pass and Yukon Corporation
Various files. Vancouver.
1) The S.S. Klondike as originally built in 1929.
   Courtesy of P.A.C.C 25230
2) In 1934, four additional cabins were added to the Texas deck cabins, after a decision by the Company to allow the Klondike a regular participation in the passenger carrying trade.

Courtesy of C.B. Andrews (42)
3) On 12 June 1936, the Klondike was holed and sank. There was no loss of life. Those on board reached shore safely and made themselves as comfortable as possible till help arrived. 

Courtesy of J. Dunn 72
4) The shore, for some on board, was not easily attained after the Klondike was holed. Evidence suggest that the drainage plugs had not been inserted when the lifeboats were launched. Water filled the lifeboats fairly quickly, but, fortunately, the shore was not far away and all those who were conveyed to safety in them reached their destination.

Courtesy of J. Dunn 42
5) The greatest menace, or more correctly, discomfort that those who were shipwrecked had to endure was probably the insect population. Relief from their harassment could be obtained to some degree through the building of smoky fires or in this case the construction of temporary shelters using the blankets salvaged from the Klondike.

Courtesy of J. Dunn 71
6) The sinking of a riverboat did not mean a total loss of that vessel, as everything that could be salvaged was. Here a barge with the Loon as tender, and using the Klondike's own spars rigged up as a derrick, is shown at work during the salvage operation.

   Courtesy of C. Beaumont
7) **Klondike** salvage being barged back to Whitehorse.  
   Courtesy of S. Smith 1
8) After the salvage operation was completed only the damaged hull remained to mark the spot where the *Klondike* finally came to rest. 

*Courtesy of United States Geological Survey 2987*

Courtesy of Howard Perchie
10) **S.S. Klondike** in frame, Whitehorse, Y.T., 1936

*Courtesy of Public Archives of Canada C-34905*
11) **S.S. Klondike** under construction above the skidways at Whitehorse, Yukon, 1936.

   Courtesy of Bill Crawford 3
12) S.S. Klondike under construction, Whitehorse, Y.T., 1936. Salvaged sections of the Klondike I were used in the construction of the second vessel to bear that name. The two king posts seen in place are an example of this policy.

Courtesy of Public Archives of Canada C-34901
13) Construction of the Klondike II was completed in 1937. The shaft of the paddlewheel salvaged from the first Klondike seen here being fitted to the new vessel reflects the fact that most if not all of the mechanical systems were transferred from the wrecked to the new vessel.

Courtesy of Jack Elliott 2
14) The S.S. Klondike moored in the slough at Lake Laberge in 1946. As the river below Lake Laberge cleared of ice two to three weeks before the lake a steamer was generally wintered at the slough to take advantage of the open river. Besides making the first main river trip of the season this steamer was put on the Steward River run to try and carry as much ore from Stewart to Stewart Landing so that when the actual shipping season started from Whitehorse there would be a cargo of ore waiting for the vessels at Stewart Landing to ship back to Whitehorse.

Courtesy of S. White 37
15) In 1950 four additional staterooms were added to the Texas deck cabins, which extended that housing aft the full length of the Skylight deck upon which these cabins sat. Overnight accommodations on board the Klondike, even with the additional cabins, were reduced in that year because of more stringent fire safety regulations.

Courtesy of Howard Perchie
16) In 1954 the S.S. Klondike was put on the river as a cruise vessel. To accommodate her new role additional housing encompassing a lounge was constructed on the aft saloon deck. Crews' quarters were also built on the freight deck to house some of the ship's complement that had occupied cabins on the passenger levels.

   Courtesy of Monte Alford
   Photo Collection (KC 362)
18) A mural in the passenger lounge addition of the Klondike in 1954. Courtesy of the Maritime Museum, Vancouver 81-29
After conversion to cruise service in 1954 the roof of the new saloon deck extension became the main focus of the passengers' outside activities. These pursuits ranged from sun bathing, shuffle board, quoits to simply enjoying the scenery.

Courtesy of the Maritime Museum,
Vancouver 81-26
20) After the vessels had been hauled up onto the skidways with the aid of large steel hawsers, one of which is visible in the photograph, the next step was to raise the ships above the ways and place them on cribs for winter storage. To raise the vessels above the ways in the 1930s, in order that the cribs could be placed under the hulls, screw jacks were used each of which required two men to turn them. All jacks had to be turned in unison so that a uniform lift was obtained. 

Courtesy of A.R. Shatford 32
21) The vessels, once placed upon the cribs, had planking that would have to be replaced the following spring, removed from their hulls. A plank, was, furthermore, removed from the hulls in their bow sections. The space left by the missing planks provided the hulls with necessary ventilation throughout the winter storage period.

Courtesy of Bill Bromley 33
22) The riverboats, once on the skidways, were separated from each other, when possible, by barges. The main purpose of this was to reduce the risk of fire spreading from one vessel to another. The barges being considered expendable in such an instance.

Courtesy of F. Dunn 113
23) The flooding of the Yukon River in the spring caused ice build up beneath the riverboats. This ice had to be removed before spring preparation of the vessels could proceed.

Courtesy of F. Dunn 106
24) The only way that the ice, that had built up beneath the hulls of the vessel could be removed was with picks and shovels.

Courtesy of F. Dunn 118
25) The order of work followed to launch the vessel in the spring was in essence the reverse of that followed in hauling them up the previous fall. Men are here in the process of jacking up the vessel in order that the cribs upon which she had sat all winter could be removed.

Courtesy of S. White
The vessel, once the cribs had been removed was lowered onto the butter boards that would carry it down the greased skidways into the water.

Courtesy of Howard Perchie
27) The **Klondike** hitting the water.

*Courtesy of Mrs. D. Wakefield*
28) A barge was placed down river from the launch position so that the vessel, once it had reached the end of its restraining cables after its launch, would be cushioned by the barge as she swung back in towards the shore.

Courtesy of Bill Lesyk 20
29) Once in the water, the vessels were either pulled or steamed under their own power to the WP&YR docks at Whitehorse, where they would receive all of the equipment and stores that had been placed in the commissary the previous fall.

Courtesy C.I. Cameron 264
30) For the downstream voyage from Whitehorse the vessel would steam upstream for a short distance at which point the bow was swung to port and the engines stopped. The manoeuvre allowed the force of the current to swing the bow around facing it downstream and once that position was reached the paddles were again engaged for the downstream voyage.

Courtesy of G.I. Cameron 251
31) The Klondike I making its turn around after leaving the Whitehorse dock. 

Courtesy of Gowen-Sutton Co. Ltd. (C. Hogg 98)
32) Of all the rapids on the Yukon River, Five Fingers Rapids, so called because of the five islands across the river, was, from the passengers' perspective, perhaps one of the more interesting.

Courtesy of the Vancouver Public Library Temp No. 64
The swiftness of the water at the 'Fingers' was only one of the problems that had to be overcome by vessels as the narrowness of the navigable channel presented its own inherent dangers. More than one vessel lost some of its housing in an encounter with the 'Fingers' before the channel was widened.

Courtesy of Mrs. H. Lewis
34) Before the navigation season was opened in the spring when the ice was still on the river and the water level was fairly low crews were sent to 'Five Fingers Rapids' to blast out a wider channel.  

Courtesy of R. Minter
35) Because of modifications engendered through blasting, the 'Fingers' today bear little navigational relationship to the rapids as steamed by the sternwheeler Victoria around 1900 when this photograph was taken.

Courtesy of the Vancouver Public Library Temp No. 62
36) A cable anchored at both ends of a rapid was used, along with the paddlewheel, to help pull a vessel through a rapid that could not be steamed. At the lower end of Five Fingers Rapids the vessel had to go into a bluff to pick up the cable and because of the nature of the shore line was the only place on the river where there were any tires to protect the vessel from damage.

Courtesy of Don Jones 13
37) Getting a line on the winch to pull the vessel through Five Fingers Rapids.

Courtesy of Claude Hogg
Once the line was on the winch, as long as no kinks were encountered that could cause the line to jump off of the winch drum, going through the rapids; although slow, was a fairly straightforward operation.

Courtesy of Bill Lesyk 11
39) When the line had served its purpose of helping the vessel through the rapids, it was taken off of the winch drum and heaved back into the water for use by the next vessel.

Courtesy of Bill Lesyk
40) Rapids were not the only hazards of navigation on the Yukon River. Herds of migrating cariboo could also prevent a vessel from keeping its appointed schedules. Courtesy of J.J. Forde
41) The ice field on Lake Laberge which broke up about 2-3 weeks after the river cleared prevented early navigation from Whitehorse. To enable a channel to be opened through the ice, lamp block, through great absorption of heat hostened the melting process, was spread near one shore. When it was deemed that the ice along this proposed route had degenerated enough a vessel pushing a stell hull barge forged a channel through the ice.

Courtesy of F. Dunn 112
42) The greatest danger in steaming the channel through the ice on Lake Laberge was that the wind would shift forcing the large lake ice pock into the shore. In such an eventuality the possible that the vessel would be crushed was not all that remote.

Courtesy of the Public Archives of Canada C-25237
43) Channels along the shore through the ice pock of Lake Laberge.

Courtesy of F. Dunn 84
44) In the early spring and late fall ice build up on the paddlewheel could drastically diminish its efficiency. At such times steam would be used to free the paddlewheel of its ice encrustation. A more serious problem with ice for the riverboats occurred in the fall when the rapid freezing of the river could catch a vessel far from a safe berth which may have meant the eventual loss of that vessel due to ice damage to its hull.

Courtesy of F. Dunn 127
45) The construction of a barge was similar to that of the hull of the riverboats that pushed it.

Courtesy of Syd Smith
The movement of a barge was controlled from the foredeck of the vessel pushing it. Cables used to swing the barge ran back from the barge to the winch through snatch blocks on the riverboats foredeck. The degree of swing was governed by retainer cables that ran straight back from the aft corner of the barge to the foredeck of the vessel.

Courtesy of Cyril Doheny #2
47) A load that was restricted to a barge was empty or full gasoline barrels. Given the right circumstances a mixture of gasoline fumes and air can be a highly explosive one. When a vessel was pushing such a loaded barge, no passengers were carried because of the inherent danger.

Courtesy of Cyril Doheny
48) The Klondike, although built to haul the same freight as a vessel and barge did at times push a barge. Its most active year in this regard was 1943 when it worked the lower river below Dawson carrying materials for the construction of the Alcan road.

Courtesy of YTA Haines Collection 1948
49) When the ship crews came up in the spring they were housed until the shipping season started in a structure known affectionately as 'Hotel Disaster'.

Courtesy of Hubert Farber 37
The wheelhouse was the main control center of a riverboat. From here the vessel was steered through the agency of the main steering wheel or a hydraulic steering control lever which in the Klondike's case extended aft at a right angle from the control panel located just aft the steering wheel. Communication to other parts of the vessel could be made through such systems as speaking tubes, bell pulls which were connected to bells located in other parts of the vessel or a ships telegraph that on the Klondike sat to the left of the steering wheel. Small control wheels for the Klondike's main search lights were also to be found on the control panel. In other words the wheel house contained all those things for the helmsman to do his job.

Courtesy of Bill Bromley
51) The forward windows of the wheelhouse were left open most of the time in order to provide the helmsman a clear and unobstructed view of the river. A canvas wind deflector called a 'dodger' was attached to the inside lower half of the open window and a sunshade on the outside provided some protection to those who stood at the wheel. The ship's bell as can be seen in this photograph sat forward of the wheelhouse with its lanyard hanging down over the forward edge of the Texas deck.

Courtesy of Bill Lesyk 25
52) A cushion covered bench sat along the aft bulkhead of the wheelhouse for the comfort of those visiting this area.

    Courtesy of Bill Bromley 3
The engine room was the engineer's workshop, office and to some extent his home, and its furnishings reflected the uses made of it as can be seen from the work desk, chair and cushion covered bench along the aft bulkhead. Communication was extremely important and the ship's telegraph hanging down from the deckhead in addition to the voice tubes near the starboard corner of the aft bulkhead kept the engineer in close contact with the wheelhouse and stokehold.

Courtesy of Sid White 29
54) Two compound, jet condensing steam engines provided the Klondike with all the power she required to do her assigned work effectively and efficiently.

Courtesy of Sid White 27
Steam to run the engines of a riverboat was provided by a locomotive type boiler, the tending of which was left up to firemen. Even with the highly efficient engines of the Klondike the firemen were required to move an average one cord of wood per hour from the deck into the fire box.

Courtesy of Al Olson
56) The purser on board a riverboat could be said to have been the vessel's bookkeeper, passenger agent and mailman in addition to which he provided other varied services. His office reflected his functions on board as it contained pigeon holes for way mail, ink stamps, filled clip boards and a desk containing the numerous forms required to run a vessel.

Courtesy of Fred Dunn 77
57) The main work force on the riverboats under the direction of the mates, was the deck crew. Some of those who served in the capacity on board the Klondike were from left to right, back row: Jim Issac, J. Scotland (engineer), unknown, D. Maclean, Herb O'Neil, S. McLeod, R. Caruso, Wilf Shields, Bill Woolman, Al Olson Front row: Claud Hogg, G. Taylor

Courtesy of C. Hogg 6
Most of the needs of the crew were provided by the company, however, some which could only be had for a price.

Courtesy of H. Forber 26
59) Most wood piles along the river were located in easily accessible locations so that, it was but a short and easy haul from the pile to where the wood was stored on board the vessel.

Courtesy of Bill Lesyk 18
60) Access to some of the wood piles along the river was quite difficult. Such wood piles presented an inherent danger to the physical well being of the crews that were required to work there. If the danger was deemed to be too great, the whole wood load may have been moved to a more accessible location.

Courtesy of Cyril Doheny 6
61) The deck crew was housed usually four to a cabin containing bunk beds. With the variable hours put in by this segment of the ship's complement these cabins were used for little else besides sleeping and storage of personal belongings.  

Courtesy of Shalford 37
The deck boy was responsible for keeping the decks washed among other duties. The ash and cinder that was continuously being emilled by the stack made this a never ending job. Len Saunders, shown with the brush, who filled this position on board the *Klondike* for a while, is shown here being helped by a deck crew member, H. Farber.

Courtesy of F. Coghlan
The possibility of fire was always a major concern on board the riverboats. Racks of fire buckets, most containing water and some filled with sand, were placed strategically on all deck levels.

Courtesy of Bill Lesyk
64) The steamer *Yukoner* on fire at Dawson, Y.T. April 1900.

Courtesy of P.A.C.  PA 16208
65) If a main river vessel reached Stewart Landing the same time that a load of ore concentrate arrived from up the Stewart River, a direct transfer of cargo took place as such a procedure saved several hours of work.

Courtesy of Frank Coghlan 27
The lead-silver ore concentrate was shipped from the mines in heavy burlap bags. The number of loaded bags shown stacked at Mayo gives some indication of the quantity of ore that had to be moved in one shipping season.

Courtesy of J. Dunn 139
When the depth of the river allowed an extra heavy load of ore concentrate to be carried, socks were also stowed along the boiler housing; however, this area was for the most part kept clear to allow easy access.

Courtesy of Bill Lesyk 22
68) Whereas after the opening of the silver-lead mines the upriver freight was mostly ore concentrate, the downriver cargos carried remained fairly constant namely those things required by any community to carry on its day to day activities.

Courtesy of Shatford 28
69) Storage facilities, other than those at Dawson and Whitehorse, for river cargo was non existent. Freight was simply unloaded onto the shore and left for the consignee to deal with as best he could.

Courtesy of Public Archives of Canada C25221
Docking facilities along the river, except for the larger communities, were non-existent. A single run off board was used if the quantity of cargo to be delivered was small. If, however, a substantial amount of freight was to be unloaded the main gang plank would be placed.

Courtesy of A. Shalford 39
The galley on board the Klondike II, although small if the number of people to be fed is taken into consideration, was so outfitted that the required work could be performed more than adequately. One of the crews who were asked to perform their appointed duties in this restricted space in the early years of the vessel was from left to right: Jim Moran, Ed Negro-Ponte, Harold Nicholson and John Dunn.

Courtesy of Harold Nicholson
In 1950 new fire regulations demanded that the bulkheads in the galley be covered with an asbestos coating and all shelving converted from wood to metal. The addition of four extra Texas deck cabins in that year also saw the elimination of the skylight in the deckhead and the installation of a fume hood over the larger coal burning stove.

Courtesy of Bill Bromley
One of ways in which work in the galley could proceed with a minimum amount of fuss was to store many of the products used there and also to perform some of the necessary galley functions in other areas. The coal for the stove was held in a bin which sat against the outside aft saloon deck bulkhead. Vegetables were stored in their own locker on the aft saloon deck in front of which can be seen, in 1943: Harry Watts, Archie Bee and Denny Moran cleaning rhubarb. 

Courtesy of Bill Maruk
74) One of the more sought after desserts by the crew was ice cream that was made on board in a two gallon icecream maker. There appears to have been no lack of volunteers to turn the handle as two deck crew members, Hubert Farber and Bill Lesyk seem to indicate. 

Courtesy of Bill Lesyk
75) Meat used on board the Klondike was stored in a well ventilated locker that sat up against the Transom where it could catch the cool spray thrown up by the paddlewheel.

Courtesy of Harold Nicholson 5
Water for use on board the vessel was taken directly from the river. For those areas of the river where the water was not fit for human consumption, clear water was stored in wood barrels as shown in the previous photograph and metal ones as shown here which were located on the various deck levels.

Courtesy of Bill Lesyk
77) Very little food went to waste on the river as grease, breadstuffs and table scraps were sold as dog food to the Indians. This trade provided the galley crew with additional pocket money above their monthly salary.

Courtesy of Harold Nicholson 6
78) The most frequent damage that occurred to the riverboats was the breakage or loss of the rudders or the paddlewheel buckets. Extra stock for the replacement of these members were carried so that repairs could be effected immediately after the damage had happened.

Courtesy of Frank Coghlan 45
79) Immediately after the cargo had been loaded at Whitehorse the gang plank was inserted in between the stanchions of the saloon deck to allow for the loading of the passengers

Courtesy of G.I. Amero 28
80) On the Klondike some of the organized activities held for the passengers such as quoits, badminton and shuffleboard, as shown here, were held on the aft saloon deck.

Courtesy of the Maritime Museum, Vancouver 80-20
81) If time allowed and enough interest was shown, the purser hid several gold nuggets in a specified area along the shore line and a contest was held to see which passengers were adept at panning for gold. The lucky participants were allowed to keep the results of their labours.

            Courtesy of S. White  19
82) The observation lounge outfitted with couches and chairs, as shown here on the Str. Whitehorse in 1953, provided passengers in the daytime with a clear view of the river in the direction the vessel was travelling and at night a comfortable common area where they could intermingle.

Courtesy of Public Archives of Canada C-4312
Observation room, Str. Whitehorse
1953
83) The dining facilities on board the Klondike could be termed to have been quite adequate. The food served the passengers and the crew was the same and also substantial. The variety of food served was such that only the crew recognized that there was a cycle to what was offered on the menu.

   Courtesy of Bill Bromley 2