

WINTER SURVEYING IN LABRADOR

by

LIEUTENANT-COMMANDER E.H.B. BAKER, R.N.

The Hydrographic Survey of Labrador was commenced by H.M.S. *Challenger* in July 1932, and it was not long before it was realised that a great many years would elapse before it could be brought to a successful conclusion, if the survey was only carried out during that period when the coast was open to navigation.

With this view in mind, Commander A.G.N. WYATT, Royal Navy, then in command of H.M.S. *Challenger*, put forward a suggestion that a party of Officers and ratings should remain in Labrador the following winter and continue the charting of the coastline and carry out the topographical work, using NAIN as a main base and setting up survey camps of arctic tents or snow-houses in such positions as would be convenient, using dog-teams and sledges or travelling over the country and the sea ice.

The suggestion was approved by the Admiralty during the winter 1932-33, at which time *Challenger* was at Portsmouth undergoing the annual refit, and by the time the ship was ready to sail in April, all plans and preparations had been made and all stores and special clothing for the winter ordered. A party consisting of 3 Officers and 5 ratings was considered to be sufficient, and these were chosen from those who had volunteered, a doctor being included among the former.

The supplies and clothing were embarked at Halifax early in October 1933, when the ship visited that port in order to complete with oil fuel, and on November 13th, the ship steamed round to Nain and the task of landing the supplies and equipment was commenced. Volunteers were many and from all departments of the ship, and thanks to their enthusiastic efforts everything was ashore by the evening of November 15th. The temperature had been dropping steadily day by day, and the weather conditions had become such that it was impossible for the ship to delay any longer, and she accordingly sailed for England during the forenoon the following day, November 16th.

The Hudson Bay Company had kindly put at our disposal a disused Hospital, which was turned into a very comfortable Main Base Camp from which to work. The first fortnight ashore was taken up restowing and sorting out all the gear and stores, and converting the Hospital into living quarters for Officers and men.

One or two short trips were made with the dog-teams in order to get accustomed to them, and likewise to let them get used to our method of

handling them, and it was not long before we felt fairly confident, although what the dogs thought about it all at this stage of the proceedings, I don't quite know.

It had not been expected that we should be able to start surveying until about the beginning of February 1934, as in a normal year ice travel is not usually possible until about the middle of December, while January is usually a month in which one expects very bad weather. This year, however, the freeze-up was exceptionally early and ice travel commenced on November 25th, and by the middle of December it was possible to travel practically anywhere on the sea ice. In view of this a Survey Camp of short duration was planned, and commenced on 14th December, in order to "break in" everyone both to camp life and surveying under arctic conditions.

For all Survey Camps, a site was first selected in a suitable position, preferably where there was a plantation of spruce trees to break the force of the prevailing wind which invariably seemed to come from the West. Provisions and equipment were then taken out and cached on the site two or three days previous to the one on which it had been decided to pitch camp, as it was found quite impossible to take the requisite amount of gear on a single trip.

Great assistance was rendered by the Eskimos and Settlers, who were always keen to sledge any of our gear out if they knew they would be passing one of our camp sites on their trips. They were all extremely trustworthy and always ready to help us in any way.

Even with these preparations the sledges were very heavily loaded on the day the party finally set out for camp and the speed of travel on these occasions seldom exceeded four to five miles per hour unless the going on the sea-ice was exceptionally hard. Once the camp site was reached it did not take long to pitch camp and have everything squared off, thanks to the ease with which the arctic tents were set up. If it had been decided to use snow-houses to live in, we usually got an Eskimo to build a couple, two or three days beforehand, for, although we could build them ourselves, we were never as expert as an Eskimo and took about four times as long, and a snowhouse for comfort must be well built.

The essential instructions for the Winter Party were "To chart all the coasts, islands, and rocks with their topography within a radius of 60 miles of Nain, and to keep a constant look-out for any disturbance of the ice which might indicate the presence of rocks or shoals and to fix such positions for future examination when the ice had broken up".

In order to comply with these instructions it was necessary to carry out a secondary triangulation and break down the Main Control. My original intentions were to man each survey camp twice, carrying out the marking and triangulation over an area covered by the size of the plane tables during the first camp, then proceeding back to the base for a short spell in order to calculate and plot the positions of the stations and marks, and then manning the camp again and charting the coastlines and completing the topography in that area.

This scheme had to be abandoned owing to the extreme changeability of



FIG. 4

*On the way to one of the Survey camps,
having just left NAIN.*

*En route pour un camp de levé,
venant de quitter NAIN.*



FIG. 5

*Typical spring sledging,
sledge completely submerged.*

*Transport typique par traîneau au printemps,
le traîneau complètement submergé.*

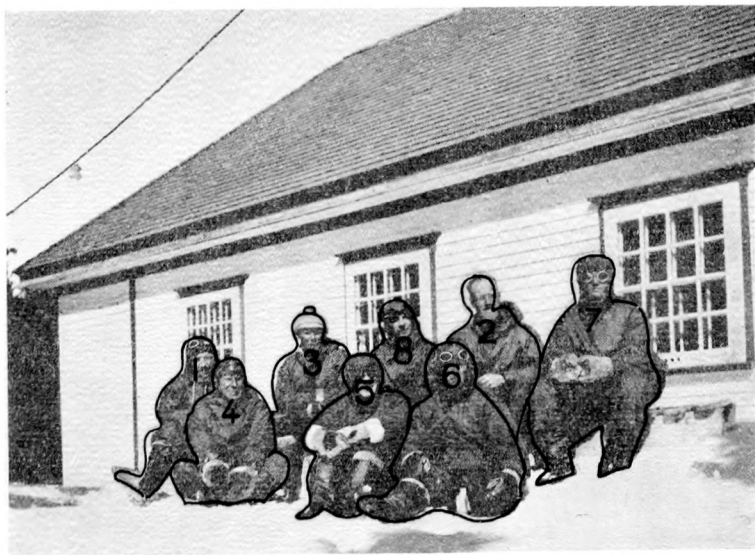


FIG. 6

1. Lt. Cdr. E.H.B. Baker 2. Lt. D.W. Deane 3. Surg. Lt. Cdr. E.W. Bingham 4. R.O. J.D. Stephenson
5. L.S. T.O. Hampson 6. A.B. F. Marshall 7. A.B. J. Marlow 8. Steward J. Holgate



FIG. 4

*On the way to one of the Survey camps,
having just left NAIN.*

*En route pour un camp de levé,
venant de quitter NAIN.*



FIG. 5

*Typical spring sledging,
sledge completely submerged.*

*Transport typique par traîneau au printemps,
le traîneau complètement submergé.*



FIG. 6

1. Lt. Cdr. E.H.B. Baker 2. Lt. D.W. Deane 3. Surg. Lt. Cdr. E.W. Bingham 4. R.O. J.D. Stephenson
5. L.S. T.O. Hampson 6. A.B. F. Marshall 7. A.B. J. Marlow 8. Steward J. Holgate



FIG. 1

NAIN
Main base survey.

NAIN
Base principale du camp de levé.



FIG. 2

*A survey camp, showing snowshoes
and arctic tents.*

*Un camp de levé montrant les raquettes
et les tentes pour l'Arctique.*



FIG. 3

Observing at an ice station.

Observations à une station sur les glaces.

the weather which made it quite impossible to make out any definite plans ahead, and rarely was one able to carry out successfully a programme that had been mapped out only the previous day. The marking, triangulation, coastlining and topographical work were carried out more or less simultaneously.

The actual scheming out of the triangulation was a simple matter, for, thanks to the numerous islands which fringe the coast, well conditioned triangles and polygons were easily formed, and if by chance the islands in any area were found to be too widely spaced, a secondary triangulation station was set up in the ice in the exact position required. These ice stations were by far the most stable and withstood all the winter gales. A hole was chopped in the ice, a small hop-pole inserted and packed round with ice and snow which froze solid in a few hours.

It would now be as well to enlarge on one or two of the various aspects of surveying as carried out under these conditions.

SETTING UP MARKS AND ERECTING TRIANGULATION STATIONS.

The erection of all marks, whether for use as secondary stations or for the purposes of fixing one's position while coastlining, occupied a great deal of time, far greater than that which would be required under normal conditions. Practically all the marks consisted of stone cairns surmounted either by flagged hop-poles or small spruce trees, the latter being cut down and trimmed, leaving a good sized tuft at the top.

The material used for building the cairns was of course frozen solid to the ground, and each individual stone or boulder had to be broken out by means of a maul or the back of an axe, and at times had to be carried some distance to the site. The plantations of spruce tree were very few and far between, and it was found best to cut down a large number from some big plantation and sledge them out to the various marks, rather than rely on finding a plantation while marking. Red calico was found to be best for the flags of small marks near the shoreline, while the usual black or red flags were used for the secondary stations. A certain amount of "yellow wash" was taken ashore as an experiment, but as much time would have been wasted cutting a hole in the ice for water to mix it with, it was not used, especially as the first good snowfall would have obliterated it.

THE HANDLING OF THEODOLITES AND SEXTANTS.

A certain amount of trouble was experienced in the early stages when using theodolites, the lubricant becoming so thick and sticky owing to the temperature that the instrument was only turned with great difficulty. This was remedied by stripping it and removing all traces of oil and using paraffin as a lubricant, which was found to be most satisfactory.

The time taken to complete a set of observations at a station was very much longer than would be necessary in a temperate climate owing to the number of compulsory "stand-easies" that had to be taken to warm up one's hands and feet.

Many experiments were carried out by all of us to find an efficient but warm covering for our hands when working a theodolite. Many variations were tried, and the warmest and handiest combination to work in was found to be a pair of chamois leather gloves over which was worn a pair of "Newfoundland mitts" of thick wool. These mitts had the index finger separate from the other three and we found them very practical for levelling and working a theodolite and even for booking.

For sledging and travelling from station to station, a pair of sealskin fingerless mitts were worn over the other two pairs and made for greater warmth and comfort.

Sextants were found to be quite easy to handle even with the sledging gloves on, especially the drum type of sextant.

CHARTING THE COASTLINES.

Coastlining in the winter seems to have many advantages over the same work as carried out in a temperate climate, especially in a country such as Labrador where the coastal indentations are numerous and varied in size. Instead of having to walk round the coastline of every small bay and inlet as would be the case ordinarily, they could be "shot in" as one walked across the mouth, and if the bays were fairly big or there were no natural objects to which angles could be taken, the assistant went round the foreshore with the sledge and planted small red flags, which were recovered on the return to camp.

When coastlining the numerous islands, it became doubtful whether the use of a sledge was justified, as the islands were all fringed with heavy broken-up ice humps formed by the rise and fall of the tide over the boulders and known locally as "bilycatters", over which it was quite impossible for a sledge to travel. This meant that when using a sledge it had to be driven round clear of these obstructions, and having stopped it when a fix was required the surveyor and his assistant would have to walk in through the "bilycatters" until the high line was reached. Much time was thus wasted and it was found far quicker, once the dogs had become used to us and our ways, to stop the sledge on the foreshore of an island, walk round and chart the coastline and pick the team up at the conclusion. For travelling from one island to another the sledge and team were invaluable.

ICE DISTURBANCE.

With regard to the ice disturbance, it proved valuable for giving the position of shoal water, but only where the shoals had a depth of 4 feet or less over them. Shoals over which the depths were known to be only 7 or 8 feet and whose positions were accurately known, showed an unbroken and flat surface on the ice above.

"INKING IN".

The inking in, in the evening, of the work carried out in the field during the day, presented somewhat of a problem to start with. The arctic tents, while comfortable enough for camping, were extremely small; and when it came to handling a field board inside them and trying to plot and ink in, they were found quite unsuitable. In addition to the lack of space, great strain was put on one's eyes due to the power of the light, 2 or 3 candles giving insufficient, as the reflecting power of the inside of the tent had been reduced to practically nil owing to griminess from the primus stove fumes.

After one or two attempts which resulted in much bad language and splitting headaches, the problem was solved by building a snowhouse. In the middle of this was placed a large block of snow which served as a table, two candles, lashed to the handles of harpoons stuck in the snow either side of it, providing the illumination, which appeared to be about equal to 100 c.p. lamps thanks to the snow walls.

A deerskin rug on which to kneel and a primus stove roaring alongside, completes the picture, inking in being carried out in great comfort thenceforth.

The bottle of ink was slung on a piece of line over the stove in order to keep its contents in a liquid state, and in addition it was found necessary to apply the nib to the flame of the primus every half minute or so, as the ink froze on the pen whilst actually inking in.

CAMP LIFE.

This was on the whole enjoyed by everyone. The tents, although small, were very cosy, and with the primus stoves going a temperature of 70° or more was maintained. Once the stove was out, of course, the temperature soon dropped, and at night was only some 10° higher than that outside. Snowhouses were palatial compared to the tents and kept a very steady temperature of about + 15° to + 20° F. without the use of a stove. They had their disadvantages, however, as the walls dripped when the stove was alight for cooking meals, and insufficient temperature could be raised in them for the drying of wet boots and clothes.

This difficulty was overcome by carrying a spare tent which was erected and used solely as a drying room after coming back to camp in the evening.

A small shelter of snowblocks was usually built in which the surveying instruments, flags, rope and spunyarn, etc., were stowed, while various precautions were taken to keep the dog-food from being stolen by the ever hungry teams. Sometimes it was hauled up into a decent sized tree if there was one handy, sometimes the boxes of chopped up codfish would be stowed under the heaviest sledge and sometimes stowed out of reach on top of a large boulder which, however, had to be at least 15 feet high. The spare snowhouse was used in one of our camps to stow 3 seal carcasses in, but this

was not an unqualified success, as the teams broke in about midnight, which necessitated a sortie on our part in order to dislodge them. This was no easy matter, and took a strenuous and blasphemous half-hour. Even then we were not to be left in peace for, after having cleared them out as we thought, repaired the damage to the snowhouse and barricaded it with sledges, etc., we turned in again. Very soon we heard sounds of contented crunching, and having leapt out to repel boarders again, found that one clever old dog had secreted himself under the carcasses during the riot and had been barricaded inside and was having the meal of his life.

The only efficient method of caching their food was to bury the boxes under cairns of heavy stones, but this of course could only be done in the spring. This completely outwitted the dogs and we slept secure in the knowledge that our night's rest would not be disturbed by their incessant raids on their larder.

The dog harness, sledge bridles and dog-whips were either stowed in between the double walls of the tents or hung up out or reach in trees, for all being made of sealskin line or walrus hide, were good fare for the dogs as we found out to our cost on several occasions.

An early breakfast and then away sledging and tramping all day was the general routine, getting back to camp in the evening. The dogs were then fed (every alternate day) by half the party while the other half brewed a mug of tea or cocoa, after which the inking in was completed. The camp was then snuggled down for the night and the evening meal of pemmican stew, sometimes made more savoury by the inclusion of a ptarmigan shot while out surveying, was cooked and eaten, and it was not long after this that the whole camp was turned in and asleep.

Books were always taken out to camp as there were many days when one could not stir from the tents while a blizzard howled outside. During these times sleeping and eating was the order of the day, and many fearsome concoctions (which, however, tasted delicious) were cooked by way of experiment.

SLEDGE DOGS.

It would be unfair to leave out any mention of our dogs, who were most interesting companions and without whose help little could have been accomplished.

We had heard various stories of the savage natures of these beasts, but soon discovered that except for isolated cases these yarns were grossly exaggerated, and that when treated decently and looked after well they were the most loveable and docile of creatures. Among themselves of course they fought like fury on occasions, chiefly at feeding time, but that was only to be expected. Their strength and sagacity were quite phenomenal, and one has to work with them to appreciate their real worth.

Ordinarily when once harnessed to a sledge, they were used to travelling long distances without stopping, and in consequence they found our work somewhat strange and took a little time to understand the necessity for stopping so often, as we did when coastlining. Once they realised that they had

to stop every hundred yards or so, it was amazing how quickly they got the drift of what was going on. They would stop dead at the word of command and all sit or lie down and watch solemnly while the necessary angles were being taken and booked. As soon as the sextant was put away and they heard the lid of the sledging box bang down, they were up and away following the trend of the coast without another word of command. The leader would even look round as soon as they came to a rocky point, as much as to say "I suppose you are stopping to fix here", and if by any chance one did not require a fix and passed on, the look of pained surprise on the faces of the whole team was most amusing to see.

Naturally suspicious at first, in a land where little or no affection was their lot, they became affectionate to such a degree as to be almost embarrassing at times, especially when one left them for a few hours whilst coastlining round an island or when making a theodolite station on top of a hill. They would then crowd round on one's return, and jostle and shove in their efforts to be petted.

Their food was an everlasting problem due, mainly, to the dearth of seals caught or shot in the autumn, which was due to the early freeze-up, and it was only through buying from the Eskimos a large quantity of salted cod which was too wet for sale to the Hudson Bay Company for export, that we were able to tide over the food question until the spring sealing.

This cod had of course to be soaked in running fresh water for three or four days, in order to remove the salt which would otherwise have been injurious to the dogs.

Even with this amount of cod behind us we were only able to feed them every other day, and codfish, while appeasing their voracious appetites for a time, has not the necessary nourishment or strength-giving power required for dogs that were working as hard as were ours. In consequence the poor beasts were very thin by the time the spring sealing came along.

SLEDGES AND SLEDGING.

The sledges we used were wider than the type in common use by the local inhabitants, and were made for us specially. Of the four sledges made, two were 16 feet in length and two 8 feet, while all were 2 ft. 3 ins. in width.

The large sledges were originally designed for carrying the gear to and from the camps while the smaller variety were to be mainly used for surveying. We soon found out, however, that the long sledges were far easier for the dogs to haul and for us to steer even though they were very much heavier, for sea ice travel is always a bumpy business at the best of times, and the long sledges rode more easily and smoothly over the rough going than did the small ones which jumped and slewed about like mad things, especially when careering down steep hills, which was not particularly good for the instruments, etc., carried in the sledging box.

Sledging during the winter was good fun as the going although rough and bumpy was usually hard, and walking or running alongside the sledge was

fairly easy and not too tiring once one was in good training. During the Spring, however, it was quite a different story.

In the early Spring the snow soon began to get soft and sticky with the heat of the sun, making travelling a tiring business both for dogs and men, and it usually meant that one or more of us had to don snowshoes and "break trail" ahead of the teams, and as none of us were as expert on snowshoes as were the Eskimos, our rate of progress was not excessive.

As the Spring advanced, the melting snow running off the hills combined with that which was melting on the sea-ice, with the result that its surface was soon covered with water which ranged in depth from a few inches up to two or three feet in places.

This necessitated the use of Flats — the local term for small flat-bottomed boats about 12 to 14 feet long — which were lashed to the sledges. The gear was stowed inside them and thus kept dry, and in addition, when the water was deep and the dogs compelled to swim, the flats kept the sledges afloat and the whole outfit was then poled along in order to help the dogs.

Surveying under these conditions became a slow business, as the average speed across the "runs" and bays was never much more than about 1 1/2 m.p.h., much time therefore being wasted in travelling to and from the camp. The shorelines were hugged as much as possible when travelling at this time of year in order to take advantage of the ice which was usually harder and drier close inshore, especially in the early morning before the sun had had time to affect it.

Good time was made under these conditions, but it was the wading across long stretches of wet slushy ice that took it out of both dogs and men, the ice under the water being pocketed with innumerable holes, the edges of which were as sharp as razors. This resulted in the dogs getting sore and cut feet and it was not long before we had a number of cripples on our hands.

Boots for the dogs were fashioned out of sealskin and fitted before starting out each morning, but as the wearers invariably removed and ate their footgear during the frequent stops, the demand and consumption soon outbalanced the supply. Another trait that some of the dogs developed about this time was the eating of their own and others' harnesses and the chewing through of the sealskin traces, and it was with feelings of surprise mingled with intense annoyance, when first it happened, that we saw half the team get up at the word of command and trot away with their traces dangling and an air of innocence on their faces, meanwhile the remainder of the team gazed at them with envy which soon changed to anger when they realised that they were still hitched to the sledge.

It took some little time to spot the culprits, of which there were usually only one or two in each team, but when once found it did not take long to cure them, although the treatment was somewhat brutal.

By the beginning of June the ice was getting in a very bad state and all the "rattles" (narrow channels through which the tide runs very swiftly) were now open water making sledging a tricky and somewhat dangerous pas-

time, with the result that surveying was abandoned on the 4th June, all the party returning to the Main Base camp to await the "break-up" which, however, did not occur until 25th June.

AFTER THE "BREAK-UP".

Before H.M.S. *Challenger* left the coast, arrangements had been made for the charter of a small schooner in order that the Winter Party might carry on after the ice had broken up, and this was accordingly taken over at the end of June.

It was fitted with an auxiliary motor, a three cylinder affair of somewhat doubtful vintage which was in its component parts when the schooner was turned over to us, but which was, we were assured, in "good running order". An attempt to assemble this machine ended in failure, a sledge hammer being required to fit one of the pistons into its cylinder with the result that it was quite impossible to crank the engine. On examination it was found that the cylinder wall had bulged slightly, due no doubt to the fact that the owner had kept the engine under the snow the two previous winters. This we did not find out until long after. The engine was then dismantled and used as ballast, and the party then set off under sail to finish up odd bits of triangulation, etc., that had to be abandoned owing to the ice breaking up round the outlying islands which it did at the end of April. A motor trap-skiff was also hired to assist in this work as well as to tow the schooner back to camp at odd times, the wind at this time of year being fitful and uncertain in direction.

All the marks erected during the winter for coastlining were now renewed and the cairns whitewashed in preparation for ship and boat sounding when *Challenger* returned. This work, as it turned out, was somewhat superfluous, as when the ship arrived on July 23rd, orders had already been given for the clewing up of this survey, which was to be done as quickly as possible, with the result that most of the marks were not used again.

SPORT.

During the whole of the winter and spring plenty of opportunities occurred for sport, chiefly in the form of shooting, and in a lesser degree skating and ski-ing, and advantage was always taken to indulge in one of these whenever possible.

Although no caribou were shot by any of us, chiefly owing to the amount of time that was required to get to and from the districts they inhabited, plenty of sport was had in the form of ptarmigan and duck shooting, the former being plentiful and much appreciated as a change from tinned food. Deer meat was purchased locally and made a welcome change in the fare at the Base camp, while sealmeat also became quite popular, especially the liver.

In conclusion, I think it can be safely said that no finer experience could have been had by any of us, and that there is not a member of the Winter

Party who would not jump at the chance of repeating it. We were all exceptionally fit thanks to the tremendous amount of walking and general exercise that was our daily portion, and although at times there were hardships, these are all the more pleasant to look back on knowing that they were over-come.

Although this winter work was more or less in the nature of an experiment, it was undoubtedly successful, and with the experience gained during that one winter the greater success of any further expedition of this nature would be ensured.

