

Fig. 1. Map of Banks Island.

NARRATIVE OF A SECOND DEFENCE RESEARCH BOARD EXPEDITION TO BANKS ISLAND, WITH NOTES ON THE COUNTRY AND ITS HISTORY*

T. H. Manning

IN 1952, Mr. Andrew Macpherson and I, in a 22-foot canoe, examined the coast-line and harbours of Banks Island from De Salis Bay around the south and west coasts to Castel Bay, where adverse ice conditions and an early freeze-up prevented further progress. We cached our equipment and canoe about 12 miles up Thomsen River, and from there walked overland to Sachs Harbour (Manning, 1953; Macpherson, 1953). Upon our return to Ottawa, the Defence Research Board, under whose auspices the expedition had been conducted, decided that an attempt should be made to complete the examination of the remainder of the coast-line during the following summer. Subsidiary objects of the new trip were to continue observations on the fauna, to make collections of birds, mammals, and plants for the National Museum of Canada, and to excavate some of the Eskimo houses at Cape Kellett that were being washed away by the sea. If possible, we were also to obtain some astronomical fixes for the control of the air photographic survey. Unfortunately, Macpherson, who had been north with me each summer since 1949, had to visit England in 1953. His place was taken by Capt. I. M. Sparrow, R.E.

Arrangements were made through Mr. L. B. Post, Acting Sub-District Administrator at Aklavik, who visited Sachs Harbour in April, for the Eskimos to mark out a landing strip on a sandbar about 2 miles west of Sachs Harbour. On May 10, we landed there on wheels in an R.C.A.F. Dakota piloted by F/O D. H. McNeill. Also in the aircraft was Dr. E. O. Höhn of the University of Alberta, who intended to spend the summer at Sachs Harbour studying the bird life, and to return in July or August with the Eskimos to Tuktoyaktuk. The landing strip was adequate, and, as the snow probably never accumulates on the bar to any extent, it might be used by wheeled aircraft throughout the winter. The surface was still reasonably firm after the thaw in late June, and summer landings also might be practicable.

On May 10 there was every indication of an early spring. We, therefore, immediately made arrangements with the Eskimos to hire three dog teams, and on the 12th Sparrow and two Eskimos, Pete Sydney and Andy Carpenter, started for Thomsen River to take up our summer supplies and bring back

*The expenses incurred in preparing this paper were defrayed by a grant from the Northern Research Co-ordination Centre, Department of Northern Affairs and National Resources.



Fig. 2. June 16, 1953. Looking up Kellett River about 2 miles from its mouth. The scarp along the north side of the valley can be seen in the left distance. The pebble island in the foreground would probably be covered at the time of maximum run-off.

specimens and surplus equipment which had been cached there the preceding year.

On May 15, three Eskimos, Fred Carpenter, Pat Herschel, and Bertram Pokiak, helped remove my camp to Cape Kellett. The preceding autumn the ground in the Cape Kellett area had remained thawed and snowless later than at Sachs Harbour or any other part of western Banks Island, presumably because of the warming effect of the open water about the cape, but now there was practically no snow-free ground at Cape Kellett or along the coast to the north, although the southern slope of the Sachs Harbour ridge and the plains to the south of Sachs River were already half bare. However, the slightly raised ruins of some of the Thule houses at Cape Kellett were nearly bare, and the excavation of two was begun at once. The weather remained cold, some days the ground surface did not thaw, and occasionally drifting snow covered the houses, but by removing the thawed soil once or twice on the warmer days, a depth of $1\frac{1}{2}$ to 2 feet was reached by mid June and excavation was practically completed. On May 30, Sparrow returned from Thomsen River, and assisted in the digging and in the collection of birds and mammals.

On June 24, we moved back to Sachs Harbour to prepare for our walk north and to examine the lowland about Sachs River which for some time had been completely snow-free. Overland travel with a loaded sledge was no longer practicable between Cape Kellett and Sachs Harbour, and the sea ice was covered by a fair amount of water, but, except for the shallow places around the shore, it was still quite solid, very different from its state at this time in 1952 (*See Manning, 1953, p. 179*). In fact, there were indications everywhere that this year spring was at least 3 weeks later. In 1952, the Eskimos had had difficulty in getting back from Egg River on June 2, and had had to go around the mouth of Kellett River; this year, the river could be crossed on snow bridges as late as June 16, and the Eskimos were still

hauling heavy loads of driftwood overland to Sachs Harbour from near the mouth of the river.

Although it was obvious that after such a late spring we should have difficulty with swollen rivers, we decided we must leave for Castel Bay by June 28 if we were to be prepared for a sudden change in weather and an early opening of the ice along the north coast. We took with us three pack dogs. These carried a maximum of about 25 pounds each and enabled us to keep our own loads below 30 pounds. With this weight we could walk in comfort and pay more attention to the country than had been feasible with the heavier loads necessary without dogs on our summer walk to Sachs Harbour in 1952. On the first part of the walk we were accompanied by Höhn, who also brought a pack dog and carried his own tent.

We wore light rubber, knee-length boots which had been designed to imitate the Eskimo sealskin boot.¹ To avoid wetting the duffle socks and vamps worn inside these boots, we usually changed into running shoes when crossing rivers above boot depth. If there had been less snow and warmer weather, we should, as in the previous summer, also have worn them at other times. Most Banks Island rivers have firm, level beds of gravel and pebbles, but the current is usually too swift for a footing to be retained in depths much over 3 feet. We crossed Kellett River in about 2½ feet of water without difficulty, but while hurriedly returning for one of the dogs that had failed to follow, I stepped into a deep pool formed by the current where the stream reunited after passing an island and was immediately sucked under by the whirlpool effect. In a larger river, or encumbered by a load, it might have been difficult to get out.

Among the hills, which rise to about 600 feet to the north of Kellett River, there was almost two-thirds snow cover, and every little stream had deep, slushy snow along its banks and an icy bottom on which it was impossible to retain a foothold in rubber boots. As it was necessary to unload the dogs for every crossing where the water reached up to their packs, progress was very slow, and when we got to Lennie River we decided to abandon a direct, overland crossing to Thomsen River, and instead, to head for the coast, where there seemed to be less snow and where we could avoid the larger streams by going out on the sea ice. We were also influenced by the impossibility of making useful topographical observations on the snow-covered terrain, and indeed, it was often difficult even to recognize our position on the air photographs. As we neared the coast there was less snow, and places could be found to cross the small streams where there was no slush along their banks or ice in their beds. About 6 miles from its mouth Lennie River broadens out and was quite easy to cross.

At Big River Höhn turned back, and we headed out over the good firm sea ice to avoid the river and its still snow-covered valley. On July 5, we crossed Storkerson Bay from our 1952 cache to Cancolim Harbour. The ice,

¹These boots were developed on behalf of the Defence Research Board with the co-operation of Mr. A. E. Blouin, of the Protective Equipment Group, and of Mr. W. H. Dotzenroth, of the Dominion Rubber Company of Canada.

particularly on the north side, was badly holed, and probably we should have been better off if we had crossed near the entrance to the bay. On July 8, we reached the valley of Bernard River and crossed over the sea ice to Bernard Island to avoid the channel that had been cut seaward through the ice from the river mouth. Next day we crossed back on the north side of the river and started inland up the valley. There had been distinctly more snow along the coast north of Storkerson Bay than there had been to the south, and conditions were worst near the mouth of Bernard River. However, after a day's walk inland, there was a marked change, and it soon became evident that the spring had been much earlier there than in any other part of the island we had seen north of Sachs ridge. Most streams were less than half the depth they had been at the height of the run-off, but the main northern branch of Bernard River was still over 3 feet deep where we crossed it, and Bernard River itself certainly could not have been crossed without swimming almost its whole width. Later in the season, however, it would probably not be difficult to cross (cf. Stefansson, 1921a, p. 235). On September 6, 1952, just above the northeast tributary, it contained only a few inches of water.

On July 15, we reached our cache on Thomsen River and found our supplies in good condition. The walk, about 200 miles measured in a straight line from Sachs Harbour to Bernard Island and thence to Thomsen River, had taken us 17½ days, and the dogs, although still in good condition, were obviously tired of packing. Indeed, after the first few days, we found that they lagged badly if we actually travelled more than 8 hours a day, and we therefore tried to avoid longer days. The dogs' feet gave no trouble on overland travel even when the ground was gravelly or sandy, but on the ice their pads became worn and bled much quicker than they would have done had they been hauling a sledge. On the whole, the dogs gave us very little trouble. Occasionally the loads would slip and would have to be adjusted, and one dog objected strongly to crossing rivers. On the walk up the coast we usually let the dogs run free and pick their own route, but after we saw the caribou along Bernard River, it seemed safest to lead them.

On July 18, we went down Thomsen River and crossed Castel Bay to Mahogany Point. The shallow Castel Bay was completely ice free, and the comparatively warm river and bay water had cut a channel seaward for about a mile into the still unbroken winter ice in M'Clure Strait, making more open water around the point than we had seen at any time during our stay the previous August. The comparative absence of ice about Mahogany Point enabled us to set out fish nets, and we soon obtained a number of arctic char and whitefish. The surplus to our immediate requirements was dried as emergency dog feed in case we should have to travel back overland to Sachs Harbour after freeze-up. By July 31, when the ice in M'Clure Strait broke up and drifted in towards Mahogany Point, making fishing more difficult, we had some 200 pounds of partly dried fish. On July 29, three caribou were shot for specimens. A little of the meat was dried; the remainder was left in quarters, and, when we were not travelling, these were hung outside on



Fig. 3. July 2, 1953. Looking north across the ice at the mouth of Big River to Sea Otter Island which is about 100 feet high. The sand, gravel, and pebble bar which runs north from Siksik Point is typical of many along the west coast.



Fig. 4. July 11, 1953. Looking down and across Bernard River from about 2 miles east of the main northern tributary.

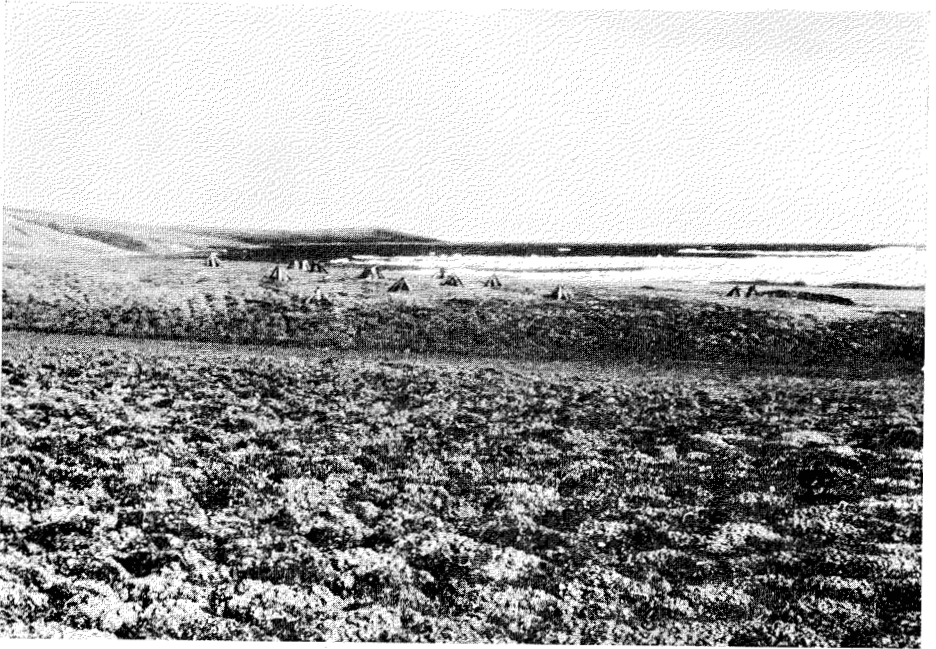


Fig. 5. August 10, 1953. Looking north along the west side of Mercy Bay from the position of M'Clure's cache to Providence Point, on the top of which the remnant of his beacon is situated. Some of the stacked barrel staves can be seen in the centre of the picture, and the coal pile at the right centre. The open water lies in the lee of Providence Point and of the shoals off it. There was almost exactly the same amount of water when we visited this spot on August 21, 1952. Note the typical frost-heaved mud in the foreground.

a pole irrespective of the weather. Two quarters which remained when we reached Holman Island in mid September were still perfectly fresh.

On August 2, a strong south-southeast wind began to move the ice off the shore between Castel and Mercy bays. We at once started to break camp, but it soon became too rough to load the canoe on the western side of the point. While we were moving the half-loaded canoe around to the north side, the engine was swamped, and we were blown out to the pack $1\frac{1}{2}$ miles off shore. We worked our way into the pack without seriously damaging the canoe, and by making frequent moves, obtained shelter until the evening, when the wind dropped and we were able to go back and complete the loading. Early next morning we rounded Investigator Point into Mercy Bay, where the ice prevented further progress. On August 5, Sparrow walked to M'Clure's cache with two dogs and brought back a load of barrel staves and coal.

On August 8, the ice along the west side of Mercy Bay loosened, and just before midnight we left Investigator Point and began to edge along the shore until we were stopped by the falling tide early next day. On the 9th we reached M'Clure's cache and loaded up with barrel staves and coal. We also

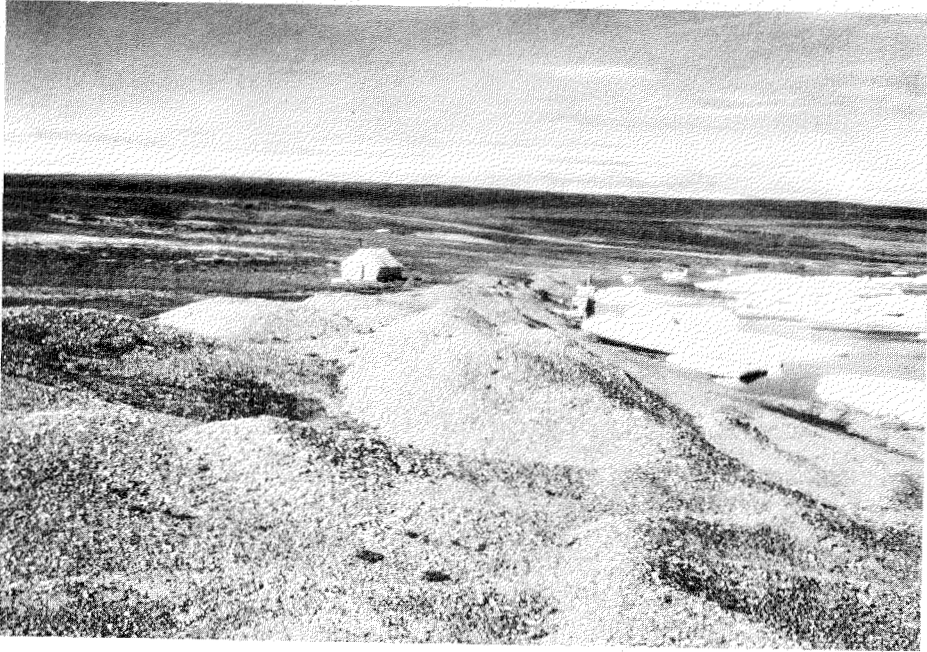



Fig. 6. August 11, 1953. The beach hummocked by ice pressure on the north side of the point immediately south of M'Clure's cache.

stacked most of the remaining staves so that they would be dry if we or another party needed them later. The amount we could carry with us was only a small proportion of the whole. We probably took all the better pieces of coal, including one weighing over 10 pounds, but a large amount of slack and small pieces remained. Like Morin (1910b, p. 176), we failed to find either the graves of John Kerr, John Ames, and John Boyle, who were buried on the beach 400 yards from the *Investigator* (Armstrong, 1857, pp. 560, 575), or the tablet erected to their memory (Osborn, 1856, p. 288).

From M'Clure's cache to the head of Mercy Bay there was open water in the small coves, but the points could only be squeezed past at high tide. The extreme head of the bay was completely open, as was the shallow, muddy water along the east side, where there was just sufficient depth for the canoe and outboard to run at slow speed.

During a quick, but fairly thorough, examination of Mottley Island we were unable to find the Eskimo 'huts' referred to by M'Clure (1854, p. 51), and if they still exist, they must be inconspicuous.¹ A more detailed examination was inadvisable, as the wind was rising and the dogs, which had been following us along the mainland shore, might wander off.

¹The words 'Esquimaux Remains' on MS. Chart D1073 appear to refer to the north central part of Mottley Island. Armstrong (1857, p. 527) mentions only that there was evidence that the islands (one is a mere rock) had been visited by Eskimos. Chart D1073 (Fig. 12) also marks 'Esquimaux Remains' on a hilltop about three-quarters of a mile inland and W.15°N. of the tip of the point at the head of Mercy Bay.


 House of Commons

Ottawa June 6 1909

This is to certify that Officer
 Jules Morin, 2nd Officer of
 the C. G. S. Arctic, have landed
 on Cape Hamilton June 6/09
 on the way to inspect the
 cashy at Mercy Bay,
 and then visited the camp
 at Point Providence where I
 tried to have information
 about the cashy and the
 ship in winter
 and then return to
 winter harbor on
 the C. G. S. Arctic have
 wintered in 1908 & 1909
 and return East in the
 middle of August to
 Pond Bay.
 Hall was aboard when I
 left 17 May
 God bless the King.
 O. J. Morin Officer

means of the information to get

Fig. 7. O. J. Morin's record from Cape Vesey Hamilton.

On August 12, we reached Back Point, but further progress was completely blocked by ice pushed up on shore. Next day, I walked inland to look for signs of a volcano reported by Green (1910, p. 157) and Morin (1910b, p. 176). However, all the hills near Back Point are covered by, and probably largely consist of, the till-like material so common on Banks Island, and none had the remotest resemblance to a volcano. I was also unable to find any sign either of the two cairns which Green (1910, p. 153) says he found on 'prominent points' near Back Point, or of the one he says his party built there and in which he left a record. However, Sparrow later found in a gully about 200 yards east of our camp staves and the bottom of a barrel, together with a piece of copper which might have been used to attach a staff. This was doubtless the remains of the 'mark' 9 miles northeast of M'Clure's cache (M'Clure, 1855a, p. 109). Krabbé (1855b, p. 716) says it consisted of a cask filled with stones. It had already been upset, probably by a bear, when seen by Krabbé on May 11, 1854.

Along the western side of Mercy Bay there was practically no driftwood, but on the east, particularly near the head of the bay, it was quite plentiful, and included several pieces 8 to 10 inches in diameter, perhaps enough all told to last a party like ours most of the winter. There was less about Back Point, and east of there we found only a few pieces, probably because the ice lining the shore prevented it stranding. We were surprised to find very little wreckage from the *Investigator* on the east shore of Mercy Bay, far less than at Mahogany Point and elsewhere on the east side of Castel Bay. This suggests that she may have been carried out of Mercy Bay and westward along the coast before breaking up.

On August 16, I walked to Cape Vesey Hamilton to look at the cairn originally built by Krabbé¹ (1855b, p. 716). There was no sign of Krabbé's record, and the pick-axe he left there had probably been removed by Green (1910, p. 153), who, however, found no record and considered that the cairn had been rifled. A record left by Morin (1910b, p. 176), who visited the cairn a few days after Green, had been perfectly preserved in a glass sealer. I copied it onto the paper in which it had been wrapped, and returned the copy to the sealer together with a note of my own. The original (See Fig. 7) is now in the Public Archives of Canada.

During the first half of August there were no northerly gales, and most of the pack visible from the entrance to Mercy Bay consisted of broken sheets of thin, rotten, 1-year ice. On August 16, a strong northerly wind blew in heavy old ice. The pressure turned the 1-year ice on edge or rafted it to several times its original thickness. On August 19, a 15- to 20-m.p.h. wind from the east opened a lead from about 4 miles east of Back Point to half-way or more across the mouth of Mercy Bay. Unfortunately there was by this time a quarter of a mile of heavy pack grounded or jammed off Back Point, as well as in Mercy Bay itself, separating us from the lead. The wind continued for 2 more days, and the lead gradually widened and extended, but

¹Lieut. Court visited the Cape Vesey Hamilton region (M'Clure, 1854, p. 49; Armstrong, 1857, p. 472), but there seems to be no evidence that he built this or any other cairn there as stated by Morin (1910b, p. 174).

it was not until August 22 that the ice left the entrance to Mercy Bay and allowed us to reach the lead. The dogs had followed the canoe along the shore for most of the way around Mercy Bay, but it was clear that eastward from Back Point there was going to be too much stranded ice for them to see us. We, therefore, made a cache of all surplus equipment and clothing of doubtful value, and discarded some of the coal and barrel staves we had brought from M'Clure's cache in order to lighten the canoe and make room for the dogs, which, however, still had to lie on top of the load. As they would insist on standing up in critical moments, they considerably reduced the seaworthiness of the already overloaded canoe,¹ and rough water twice forced us to seek shelter among the grounded ice along the shore before we reached Cape Vesey Hamilton. We rounded this cape at 2.00 a.m. on August 23, and continued to Pim Ravine, where we were blocked by the pack and had hastily to cut a way in to shore through the young ice that had been forming among the grounded floes for the last few days. A few minutes later the pack closed in behind us, and we congratulated ourselves on having been stopped at a place where there was a shelf of flat land between the shore and the cliffs, and where a ravine (*See Manning et al.*, 1956, pl. IVB) appeared to offer a good route south. It had snowed during the night, and 2 or 3 inches of snow already lay in the ravine. This was added to during the next few days, and almost certainly did not completely thaw again before spring. It was soon clear, however, that considerably more snow would be needed before sledge travel along the stony bottom of the ravine would be practicable, and as there was no sign of caribou and little chance of hunting seals in the tightly pressed pack, we decided it would be necessary to carry our load up the snow-covered scree slopes and gullies to the 800-foot high plateau, where there was 4 or 5 inches of snow. Our concern, however, was unnecessary, for on August 28 a strong easterly wind, blowing slightly from seaward, started to open a lead along the shore. We packed and got off at about 1600 hours. As far as Cape Rodd the lead was several hundred yards wide. East of there, it was narrower and filled with slush and small ice fragments. Except around the outwash fans at the entrance to the ravines, a solid ice shelf, rising about 10 feet above the sea, lay unbroken along the coast. Immediately above the ice were steep scree slopes topped by nearly vertical cliffs. To be caught by ice pressure resulting from a sudden change of wind or tide in such a situation would have meant almost certain loss of the canoe and most of the load. Finally, it became too difficult to force the canoe through the brash ice, and we retraced our route for about 2 miles to an outwash fan at the entrance to a ravine, where we had noted safe shelter behind grounded ice. Although it was only the end of August, the young ice behind the grounded pack easily bore our weight.

After a few hours' sleep we woke to find a strong southerly wind had opened a wide lead along the shore. We had no further difficulty from the

¹We had used up about half the gasoline we had taken from Sachs Harbour in 1952, but we had added to our load survey equipment, a small komatik, a pair of skis and snowshoes, as well as some extra food and the dried fish caught at Mahogany Point.

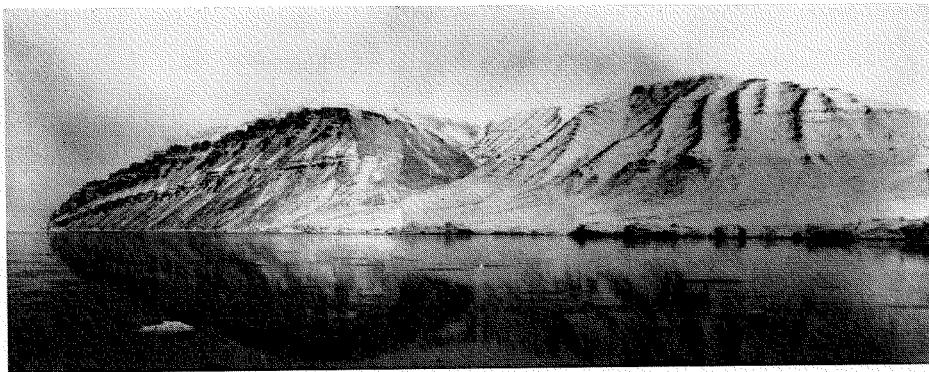


Fig. 8. August 23, 1953. Looking east from between Cape Vesey Hamilton and Pim Ravine. In the right hand photograph there is a narrow flat between the shore and the scree slopes. Farther west, towards Cape Vesey Hamilton, the screes again drop directly to the water. The easterly dip which can be seen in these photographs also continues to the westward.

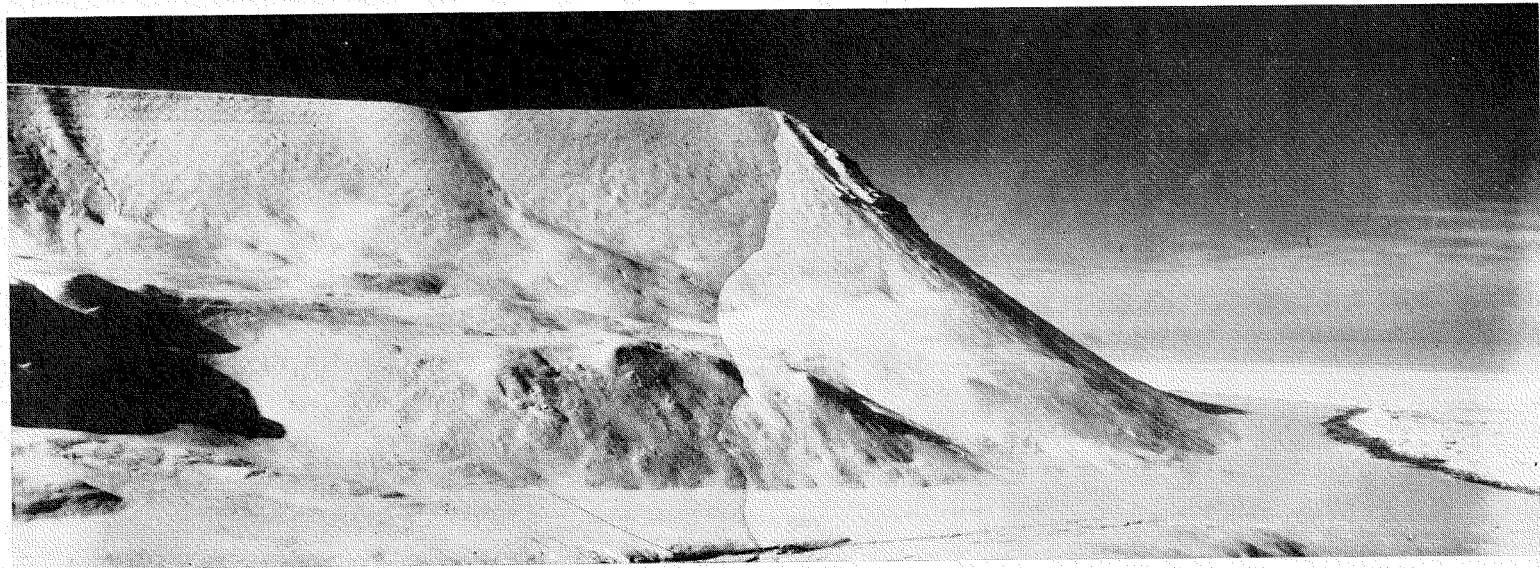


Fig. 9. August 27, 1953. Looking northwest from about a mile east of Pim Ravine. The best route onto the plateau appeared to be up the centre of the 800-foot slope facing the photographer. Note the narrow fringe of shallow water and tidal mud inside the grounded ice which sheltered our canoe.

ice until we were near Russell Point. There strong currents were causing rapid movement and some pressure against the fragments of an ice island and the piled up pressure ridges that lay on the point. After a 6-hour wait, the ice loosened with a change of tide, and by going farther out among the pack than is normally advisable, we were able to round the point and get into the open water of Prince of Wales Strait. As we travelled southeast from Cape Rodd, we noticed a gradual decrease in the amount of snow along the coast, and at Cape Russell the land was entirely bare. Another indication of warmer weather was the absence of young ice amongst the grounded pack in Prince of Wales Strait.

Off Cape Russell we sighted the icebreaker U.S.S. *Burton Island* and followed her down the coast for about 10 miles. When she stopped for the night we went on board and were hospitably entertained until a rising wind forced us to hurry ashore. Next morning a strong northerly gale was driving loose pack into Prince of Wales Strait and had undoubtedly again blocked the northern coast of Banks Island. On August 31, we continued south down Prince of Wales Strait, usually keeping close in to shore in the shallow water behind the grounded ice, but occasionally having to make hurried dashes into the fast-moving pack to get around the pressure ridges at the points. On September 1, we crossed the strait to Princess Royal Islands. Near the place where the *Investigator* had wintered in 1850-51, there was a stranded ice island. From Princess Royal Islands we headed south along the Victoria Island coast, and after being held up for a few days by bad weather, reached Holman Island on September 11. Two days later we were picked up by an Associated Airways Norseman, and were back in Ottawa on September 15.

During the summer, notes were made on the coast-line traversed, air photographs were compared with ground features, both along the coast and on our overland walk, about 350 ground photographs were taken to show topographical detail, tide readings were taken whenever possible, and an astronomical position was obtained at Mahogany Point. One hundred and ninety-two bird (See Manning *et al.*, 1956) and 212 mammal specimens were obtained for the National Museum of Canada as well as artifacts from the Cape Kellett Thule houses. We also collected geological and plant specimens. The latter are recorded in Porsild (1955).

History of Exploration

In 1820, Lieut. F. W. Beechey sighted land to the southwest from the Melville Island coast, and Parry, who saw it the following day, named it "Banks's Land, out of respect to the late venerable and worthy President of the Royal Society" (Parry, 1821, pp. 237-8).

Thirty years later, on September 7, 1850, Commander R. J. LeM. M'Clure landed from H.M.S. *Investigator*¹ on a fine pebbly beach a short way eastward

¹A condensed account of the voyage of the *Investigator* is given by M'Clure (1854; 1855a,b) in the Parliamentary Papers; a longer narrative was published by Osborn (1856), who had access to M'Clure's records; but the best description of the country is by Armstrong (1857), surgeon to the expedition. The accounts (which have minor discrepancies) of all three authors have been used in preparing the following summary.

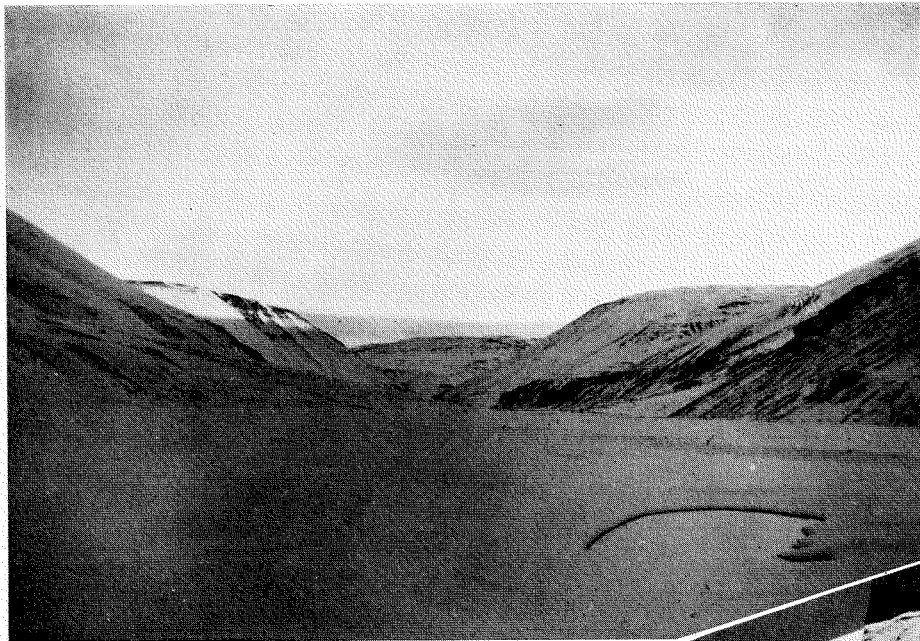


Fig. 10. August 28, 1953. The ravine 11 miles south-east of Pim Ravine where we were stopped by ice. The hills were estimated to be about 700 feet high, that is to say, a little lower than those at Pim Ravine. The slopes up to the plateau are distinctly less steep and the gullies more open than in the ravines farther to the northwest.

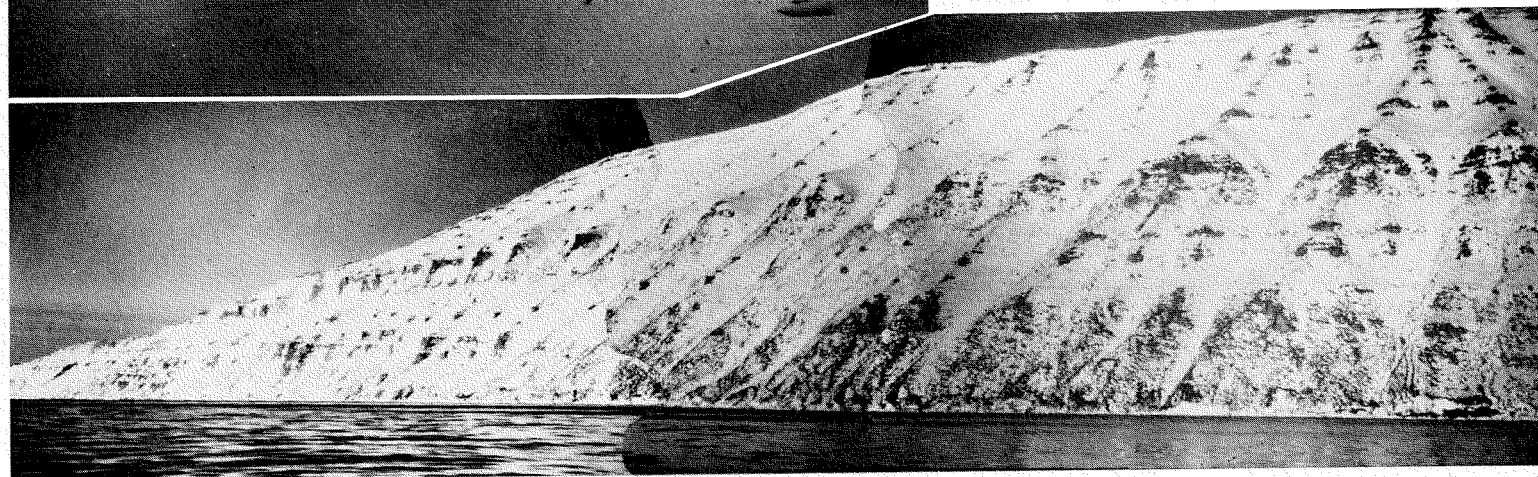


Fig. 11. July 29, 1953. Cliffs and scree slopes estimated to be 500 to 600 feet high midway between Rodd Head and Parker Point. The narrow ice foot is a little more broken than it was farther to the northwest.

of Nelson Head, and, being unaware that this was part of the island discovered by Parry, named it "Baring's Island" in honour of the First Lord of the Admiralty. From Nelson Head, the *Investigator* sailed northeastward into Prince of Wales Strait, where she reached latitude $73^{\circ}07'$, longitude $117^{\circ}10'$ on September 17. All hope of getting farther north that year was abandoned by the end of September, and preparations were made for wintering in the pack about $2\frac{1}{2}$ miles north of Princess Royal Islands.

Between October 21 and 31, a sledge party under M'Clure visited the northeast point of Banks Island. The following spring another party under Lieut. S. G. Cresswell left the *Investigator* on April 18 and followed the northeast coast of Banks Island as far as Cape Vesey Hamilton. On May 22, 2 days after his return from the north, Cresswell set out again along the southern coast and reached Cape Lambton.

The *Investigator* was liberated from the ice on July 14, 1851, but having got only 3 miles farther north than in the previous year by August 16, M'Clure abandoned the attempt to pass through Prince of Wales Strait and sailed southward, rounding Nelson Head in open water on August 17. After examining the harbour on the north side of Cape Kellett, which was found to have a depth of 5 fathoms, the *Investigator* made rapid progress up the west Banks Island coast, keeping 1 to 2 miles off shore and inside the pack ice. On August 19, she passed inside Norway and Robilliard islands,¹ obtaining a minimum depth of $2\frac{1}{2}$ fathoms within the latter channel. After rounding Cape Prince Alfred, the ice, which lay 700 to 800 yards off shore, became much heavier. On August 20, the pack closed in and M'Clure was forced to secure the ship to a piece of grounded ice near Ballast Beach. A little progress was occasionally made along the coast, but Colquhoun Point was not passed until September 19, and Cape Crozier not until the 23rd. Progress was then rapid in comparatively open water until 1930 hours, when, in snow and darkness, the ship, which had entered Mercy Bay, ran upon a mud bank 600 yards off Providence Point. After floating her off next day, they proceeded 3 miles farther into the bay, where M'Clure decided to winter. That night the *Investigator* was firmly frozen in.

On October 4, a sledge party under Mr. S. Court went about 18 miles (M'Clure, 1854, p. 49) (11 miles according to Armstrong, 1857, p. 472) along the coast to a position thought to have been reached by Cresswell the preceding spring, but was unable to find Cresswell's cairn, probably because of the slumping of the land in that area. Further progress along the coast was blocked by open water.

On April 11, 1852, M'Clure left for Melville Island, returning to Mercy Bay on May 9 after depositing a record at Winter Harbour. The ice in Mercy Bay did not break up that year; by August 19 new ice was forming, and by the 27th it would bear a man. No major excursions were made from Mercy Bay during the summer of 1852, and in the following winter all the

¹M'Clure (1854, p. 44) indicates that they passed between these islands, but it is clear from Armstrong (1857, p. 385) and Osborn (1856, p. 203) as well as from the charts that they went to landward of both.

expedition's energies were concentrated on hunting to supplement their reduced rations.

On April 6, 1853, a sledge party under Pim (1855) arrived at Mercy Bay from H.M.S. *Resolute*, then wintering with H.M.S. *Intrepid* at Dealey Island. Two days later M'Clure started back with Pim in order to communicate personally with Capt. Kellett of the *Resolute*. On April 15 a party of 28 under Cresswell also left for the *Resolute* in order to save the *Investigator's* food supplies for another summer's attempt to get free and for a possible further winter. However, on M'Clure's return with Dr. Domville (1855), it was determined that the crew were not fit for this (Armstrong and Domville, 1855, pp. 70-2), and as a sufficient number of men to work the ship did not volunteer to remain, it was decided that she must be abandoned. The greater part of the ship's stores and provisions were placed on the beach, a cairn was built on a neighbouring hill (See p. 70), and a tablet erected to the memory of the three men who had been buried on the beach. Then the remainder of the expedition, 32 all told, left for Melville Island by sledge on June 3 to join the *Resolute* and *Intrepid* which intended to return to England the following summer. However, they were caught by the Melville Sound pack and frozen in in the autumn. Next spring, 1854, Krabbé (1855a,b), master of the *Intrepid*, made a sledge journey to the *Investigator*. He reached Russell Point on April 28, and followed the coast from there to Mercy Bay, where he arrived on May 5. He found that the ice of Mercy Bay had again failed to break up during the preceding summer, and the *Investigator* floated in 11 fathoms of water on a bearing S.12°E., 1,400 yards distant from the cairn, and 426 yards from the nearest point of the beach. She had leaked during the preceding summer and contained considerable ice, so additional supplies and equipment were moved ashore to M'Clure's cache.

All the zoological specimens collected during the *Investigator's* voyage were abandoned when the crew retreated to Dealey Island (Armstrong, 1857, p. 603), and apparently even a number of journals were left behind, as Krabbé (1855b, p. 715) mentions being able to find only Lieut. Haswell's in the ship in 1854. Krabbé also recovered some zoological and botanical specimens on this visit. The latter are still extant (Porsild, 1955, pp. 30-1). On May 14 he left Cape Vesey Hamilton for Melville Island.

On August 26, 1851, Nelson Head was sighted by Capt. Richard Collinson in H.M.S. *Enterprise*. From there, Collinson followed M'Clure's route of the preceding year up Prince of Wales Strait, reaching latitude 73°30', at the extreme northern part of the strait, on August 31. Further progress was then blocked by pack ice and they turned south to look for a wintering place on the west side of Banks Island. On September 7 they reached Terror Island, but ice prevented them proceeding farther. Kellett Harbour was considered too exposed¹ for wintering, and the bar at Sachs Harbour prevented the ship from entering. As they knew of no other harbour in southern Banks Island, they returned eastward to Victoria Island, and found safe anchorage at

¹Or too shallow (Collinson, 1855a, p. 945; 1855b, p. 199).

Walker Bay (Collinson, 1889, pp. 152-165). Next summer, on August 26, a brief landing was made 12 miles east¹ of Nelson Head (Collinson, 1889, pp. 228-9).

During early May 1854 a sledge party from the *Resolute* under Meham (1855a) travelled down Prince of Wales Strait to Ramsay Island in search of the *Enterprise*. The only part of Banks Island visited was Russell Point, on May 16.

The accounts of Meham (1855b), Krabbé (1855b), Domville (1855), and Pim (1855), like those of most of the Franklin Search reports published in the Parliamentary Papers, are illustrated by detailed charts showing their routes and the coast-line surveyed. Unfortunately, similar charts do not accompany the reports of M'Clure and Collinson or of the sledge journeys of their officers. The track of the *Investigator* is shown on Inglefield's comparatively small-scale chart (1853),² and the track of both the *Investigator* and the *Enterprise* on the equally small-scale charts accompanying Osborn (1856), Armstrong (1857), and Collinson (1889), but the best chart of M'Clure's and Collinson's discoveries north of latitude 72° is published with the 1855 Parliamentary Papers (Chart 1854) on a Mercator scale of ¾ inch to 1° longitude. South of latitude 72°, a similar chart illustrates Collinson (Collinson and Rae, 1855). Neither of these charts shows the tracks of the ships or, with one exception, of the sledge parties, but the northern chart gives a line of soundings along the west Banks Island coast which no longer appears on Admiralty charts (Admiralty Chart No. 2118). No soundings are given along the north coast, although a few were certainly taken (Armstrong, 1857, pp. 388-9). A number of comparatively detailed MS. charts of Collinson's and M'Clure's voyages are preserved in the Admiralty Hydrographic Office's archives. A list of those relevant to Banks Island, prepared from the photostats in the Public Archives of Canada, is given as Appendix III. There is a remarkable variation in detail even among those drawn by Stephen Court, Second Master on the *Investigator*. The one used for drawing Chart 1854 appears to have been L9304. MS. Chart D1075 and other charts originating from the *Enterprise* show sledge routes as well as ship tracks, but the only sledge routes shown on the *Investigator* charts are those crossing from Mercy Bay to Melville Island. The chart which M'Clure (1854, p. 41) says accompanies his letter and shows "the extent of discoveries and the course of each searching party" is, therefore, missing.

Considering the conditions under which the surveys were made, M'Clure's

¹Probably on the east side of De Salis Bay, See MS. Chart D1075.

²I think this must be the chart dated 1853 referred to by [Hinks] (1924, p. 522) as accompanying M'Clure's 1854 report in the Parliamentary Papers. However, it shows only a generalized track of the *Investigator* and the sledge route to Melville Island. Also, there are distinct differences, particularly about Mercy Bay and Russell Point, between it and the Admiralty Chart of 1855 as illustrated by [Hinks] (1924, p. 521). Inglefield (1853) is evidently taken direct from MS. Chart L9311, also signed by him, and seems to follow Stephen Court's originals (See Appendix III). The northern part of Banks Island on the Admiralty charts is from Chart 1854, which is on a larger scale and more detailed than Inglefield (1853), and apparently embodies Meham's survey (1855b) of Russell Point.

charts are in general remarkably accurate (cf. [Hinks] 1924, p. 523), certainly more accurate than is indicated by Stefansson (1921b, p. 298), and discrepancies between them and modern maps can frequently be explained by the appearance of the coast from off shore (cf. Wilkins, 1917, p. 66). M'Clure's failure to observe Storkerson Bay¹ may have been due to bad weather, and the weather was evidently again bad when they passed the entrance to Castel Bay shortly before running aground off Providence Point on September 22, 1852, but how Castel Bay, only 10 miles distant from Mercy Bay, could have failed to be discovered subsequently is, as Stefansson (1921a, pp. 361, 476) points out, a mystery. The most likely explanation is that it was discovered, but that the MS. charts on which the subsequent published charts were based were not revised. In support of this theory it may be noted that Chart D1073, the large-scale chart of Mercy Bay which, as the soundings indicate, must have been drawn after some months of residence, probably in the summer of 1852, correctly marks Providence Point and the *Investigator's* anchorage. The other MS. charts and the published charts mark Providence Point and the shoal on which the *Investigator* grounded at the northwest point of Mercy Bay, an error that must have been seen and realized at least by the navigator, Stephen Court, early in the winter. The chart accompanying Armstrong (1857) even suggests that Castel Bay may have been confused with the non-existent bay marked just east of Cape Crozier.

In 1908, the D.G.S. *Arctic*, J. E. Bernier, wintered at Winter Harbour on Melville Island, and during the following spring journeys were made from there to Banks Island. The first of these, under Morin (1910a, pp. 126-38), reached Banks Island near Russell Point and made an unsuccessful search for M'Clure's cairn there and at 'Mount Observation' before returning to Winter Harbour. The second party, under Green (1910, pp. 147-61), reached Rodd Head on May 19; then followed the coast to Mercy Bay. No trace of the *Investigator* or M'Clure's cache could be found, and after examining the west side of the bay they began the return journey on May 26. The third party to visit Banks Island was again led by Morin (1910b, pp. 167-77). They reached the coast near 'Mount Bernier' on June 2, and followed it westward to Mercy Bay, where the remains of M'Clure's cache were found. The return journey was begun on June 10.

From 1914 to 1917, there were always some members of the northern section of the Canadian Arctic Expedition (Stefansson, 1921a) on Banks Island, and an almost continuously occupied base camp, at which the *Mary Sachs* was hauled ashore in 1914 and where she remained throughout the expedition, was situated half-way between Cape Kellett and Sachs Harbour.² From 1915 to 1917, the *Polar Bear*, wintering first at Armstrong Point and then at Walker Bay on the Victoria Island coast just east of Banks Island, formed another base. A third was established by G. H. Wilkins, who took the *North Star*³

¹The entrance to this bay is clearly marked on Collinson's MS. Chart D1075.

²The site of this camp is now known locally as 'Mary Sachs'.

³This vessel could carry several tons, but drew only 4 feet 2 inches (Stefansson, 1921b, p. 291).

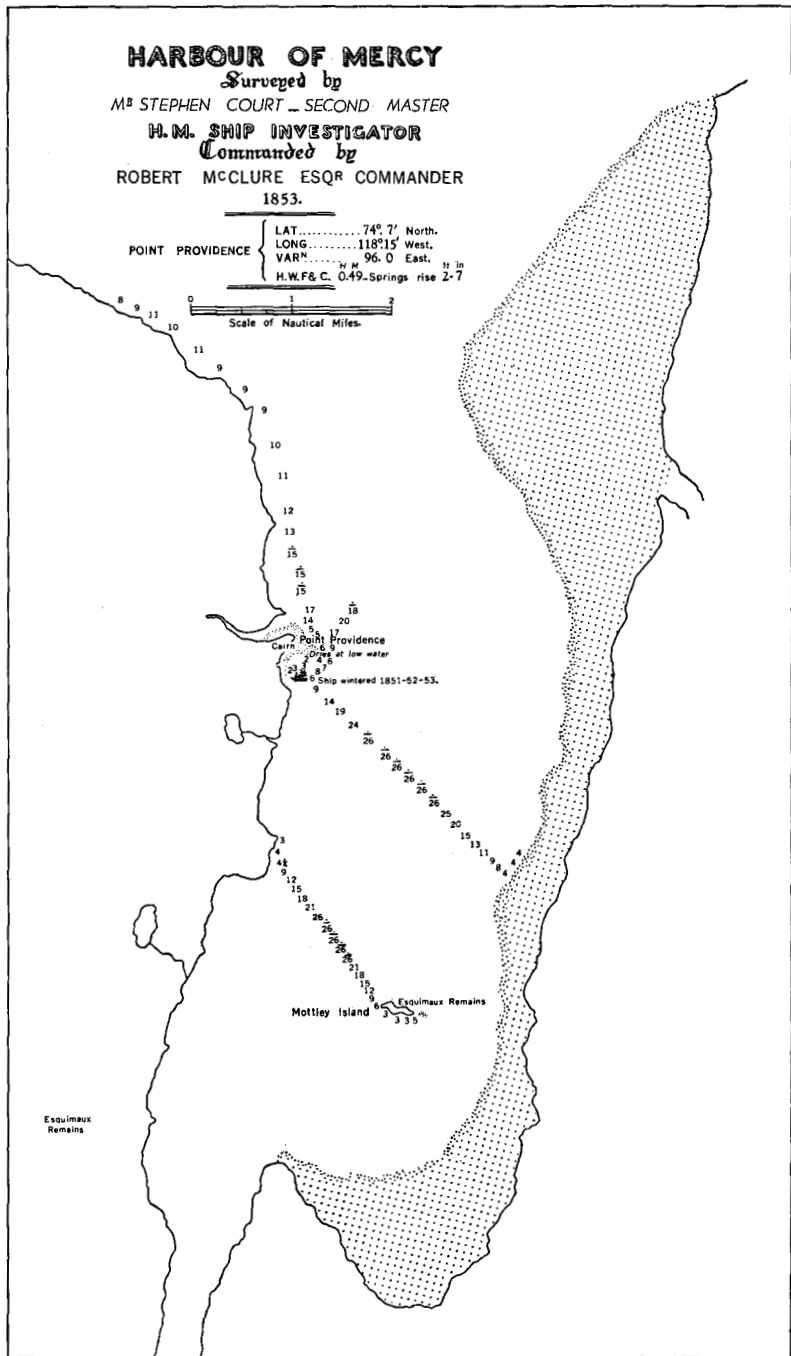


Fig. 12. This plan of Mercy Bay is drawn from a photostat copy, measuring 24 in. x 14 in., of the original document, which is preserved in the archives of the Hydrographic Department of the Admiralty. It is reproduced here by courtesy of the Hydrographer. The small size of the original figures necessitated redrawing rather than photographic reduction. The complicated but not very accurate hatching of the hills shown in the original has been omitted. The stippling on the east side of the bay shows the approximate limit of the lagoon which lies inside the grounded ice. This stippling is placed reasonably accurately except at the head of the bay, where deeper water lies considerably closer to land.

up the west coast to the vicinity of Norway Island in August 1915. The existence of these three bases resulted in a considerable amount of travelling on Banks Island and in some changes and additions to the map (See McDiarmid, 1923).¹ Also, about 100 bird and mammal specimens, now in the National Museum of Canada, were collected, chiefly at Cape Kellett, by G. H. Wilkins and P. Bernard. However, the main interest of the expedition was the Beaufort Sea and the islands north of M'Clure Strait, and neither the official accounts (Desbarats, 1916, 1918; Stefansson, 1920; Wilkins, 1917),² the semi-official (Stefansson, 1918, 1921a,b), nor the strictly popular (Noice, 1924; Montgomery, 1932; Masik and Hutchison, 1935) give any detailed account of the topography and geology.

On June 25, 1914, Stefansson and two companions landed on Norway Island, having crossed the ice from Martin Point, Alaska. From Norway Island, they discovered and crossed to Bernard Island and thence to Banks Island, where a caribou hunt was made into the interior. On September 1 they started southward down the coast, reaching Cape Kellett on the 11th and meeting Capt. Peter Bernard with the *Mary Sachs* which had been beached. The autumn was spent hunting in that vicinity. On December 22, Stefansson went to De Salis Bay and Prince of Wales Strait, primarily to see if any Eskimos were wintering on Banks Island. None were found, and he returned to the Kellett base. In mid February his sledge party started up the west coast to Cape Prince Alfred en route to Prince Patrick Island. They returned to Banks Island on July 15, landing on the east side of Mercy Bay. After following Thomsen River for some distance inland, they headed for Cape Kellett, where they met the *Polar Bear*. In this vessel Stefansson visited Herschel Island, returned to Kellett, and thence went around southern Banks Island and up Prince of Wales Strait. They were stopped by ice near Princess Royal Islands, and established winter quarters 10 miles south of Armstrong Point on the Victoria Island side. Stefansson left there by sledge on November 16, and after visiting Ramsay Island, he crossed to Banks Island and then overland to the Kellett base and up the west coast. In March, three of Stefansson's sledge parties went east from Cape Prince Alfred to Mercy Bay, and thence to Melville Island. Meanwhile, Storker Storkerson, after two attempts to cross overland from the *Polar Bear* in Prince of Wales Strait, had followed the coast to Mercy Bay, and from there had also gone north to Melville Island.

In late October 1916, Bernard and Thomsen left Cape Kellett to take mail and supplies to Stefansson on Melville Island. They travelled around the west and north coasts of Banks Island and out on the ice some 20 miles north of Mercy Bay; then returned for unknown reasons. In May 1917, Castel and Anderson, who had been dispatched by Stefansson to investigate their failure

¹One result was to show that the northern part of Banks Island had been plotted too far east. This correction has since been confirmed, and a similar adjustment found to be necessary in the south. It is clear from the MS. charts that the whole island was plotted on the published Admiralty charts from the *Investigator's* survey, and that Collinson's MS. chart, D1075, was entirely neglected. This was unfortunate, as the co-ordinates of D1075 are remarkably accurate, and the chart gives the southern part of the island its comparatively narrow form, only recently proved correct and adopted.

²Wilkins (1917, pp. 65-7) gives a brief account of the coastal area.

to arrive in Melville Island, found two sledges and a note at Mercy Bay, and about 2 days' journey along the coast to the west, the body of Thomsen Bernard was never found. Stefansson's party returned to Banks Island on July 25, and landed at Russell Point. From there, they followed the coast south-westward for a few days, and then headed overland to Cape Kellett, where they arrived about August 17 and were eventually taken off by the *Challenge*.

In 1940, Larsen (1945a, pp. 11, 38) examined De Salis Bay with a view to using it as a winter harbour for the R.C.M.P. vessel, *St. Roch*, but decided it was too large and subject to ice pressure. The *St. Roch* was anchored in the harbour from September 22 to 25. The following spring, between March 17 and April 27, Larsen (1945a, pp. 70-4) made a patrol from the winter quarters of the *St. Roch* at Walker Bay, Victoria Island, to De Salis Bay, Sachs Harbour, and Sea Otter Harbour. On a second patrol between May 17 and June 1 (pp. 75-7) he visited Princess Royal Islands and 'Johnson Bay' (not precisely identified: *See Appendix IV*). Between September 3 and 4, 1944, the *St. Roch* passed southward through Prince of Wales Strait, apparently without making any landings (Larsen, 1945a, p. 59; 1945b, p. 313; 1947, p. 13).

Dr. and Mrs. A. L. Washburn walked around part of De Salis Bay on August 13, 1938, when on their way to the mainland from Walker Bay, Victoria Island, with George Porter in the schooner *Foxe* (A. L. Washburn in letter dated April 4, 1956). In August 1943, Donnelly (1943a,b), travelling by air, established an astronomical control position on the north side of Windrum Lagoon. Three years later, Oldenburg (1946; Porsild, 1955, p. 31), with E. J. Boffa as pilot, made four landings on Banks Island, including one at Mercy Bay, between August 19 and 20, while collecting plants. She again visited the island in 1954.

In 1948, an R.C.A.F. Canso, carrying a Dominion Observatory magnetic, geographical, and survey party consisting of P. H. Serson, R. D. Hutchison, John Carroll, and J. L. Jenness, landed in Castel Bay and Windrum Lagoon (Serson, 1948; Jenness, 1948).

In the summer of 1949, Porsild (1950, 1955), accompanied by Jenness (1951), visited Banks Island in a Norseman aircraft piloted by Ernie Boffa. Porsild was primarily engaged in making botanical studies and collections; Jenness did geographical work. Landings were made at the following places: Sachs Harbour, July 30; lagoon east of Masik River, July 30-1; De Salis Bay (Windrum Lagoon), July 31, August 24-5; lake 30 miles west of Russell Point, August 10-21, 23-4; inland lake east of Thomsen River, August 21-2; Bernard Island, August 22; southeast shore of Mercy Bay, August 22; east coast of Banks Island 30 miles south of Russell Point, August 24; Durham Heights, August 25; near Nelson Head, August 25. On the first flight to Banks Island from Victoria Island, July 30-1, Porsild and Jenness were accompanied by Dr. and Mrs. A. L. Washburn.

In 1951, hydrographic and oceanographic observations were taken from the C.G.S. *Cancolim II* off the south and west coasts of Banks Island, and brief landings were made at Storkerson Bay on August 26, Cape Kellett on August

27, Sachs Harbour on August 28, De Salis Bay on September 2, and Nelson Head on September 4 (Manning and Hattersley-Smith, 1951; Hattersley-Smith, 1952). An astronomical control position was established at Cape Kellett by Hattersley-Smith (1951).

In the autumn of 1953, an R.C.M. Police post, and in 1954, a weather station, were established at Sachs Harbour. In the summers of 1953 and 1954, the U.S.S. *Burton Island* worked in Prince of Wales Strait. In the 1954 season, she was joined by the U.S.C.G.C. *Northwind*, which came through M'Clure Strait, and by H.M.C.S. *Labrador*, which came from the east and continued down Prince of Wales Strait to make the Northwest Passage. In both seasons some survey work was done on Banks Island and in the surrounding waters (See Richardson, 1956; Forrester, 1954a,b,c), but full details must await the release of the official reports.

Visits by Whalers and Trappers

The first whaling ship wintered at Herschel Island in 1889-90, and later vessels also wintered at Baillie Island, Langton Bay, and Cape Parry, and two small schooners even as far east as Victoria Island (Anderson, 1913, p. 497). Whales were frequently taken between Nelson Head and Cape Kellett, and also, when ice permitted, on the west coast of Banks Island. Occasionally a party from a whaling vessel landed on Banks Island and killed a few caribou. (Pedersen, 1953.) In 1906, Stefansson (1921a, p. 240) was told of two landings on the southwest of Banks Island; one a few years earlier from an Eskimo vessel, the *Penelope*, and another from the *Narwhal*, which was commanded by George Leavitt. In early July 1906, the whaling ship *Jeanette* crossed to Nelson Head, sailed along the coast to Cape Kellett, and northwest into the Beaufort Sea (Harrison, 1908, pp. 128-30). In 1916, Pedersen visited Kellett and Masik River in his motor vessel *Herman*, and he was there again in 1919 and 1921. On the last occasion he went over 20 miles up the west coast and Mrs. Pedersen landed at Mary Sachs, thus probably becoming the first white woman to set foot on Banks Island (Pedersen, 1953).

In 1916, August Masik and Adolf ('Otto', Stefansson, 1921a) Binder were left by the schooner *Challenge* to establish a hunting camp at De Salis Bay,¹ but during the winter they went to Cape Kellett and joined Stefansson's party (Masik and Hutchison, 1935, pp. 107-38). In 1917, when Stefansson left Kellett in the *Challenge*, J. R. Crawford, one of the previous owners of that vessel, purchased the *Mary Sachs* and the supplies remaining at Kellett. He stayed on Banks Island (Stefansson, 1921a, pp. 663-5) with an Eskimo family until they were taken off by Pedersen (1953), probably in 1919. In 1932, two white trappers attempted to reach Melville Island via the west coast of Banks Island. They began the winter in the bay just south of Cape Prince Alfred, but soon ran short of food. They abandoned their motor vessel, the *Cora*, which still lies on the beach, made their way south to the Eskimo camp,

¹It seems likely that a turf house, now falling into the sea, located where the northern end of the Cape Collinson cliffs degenerate into a cut bank, belonged to Masik and Binder.

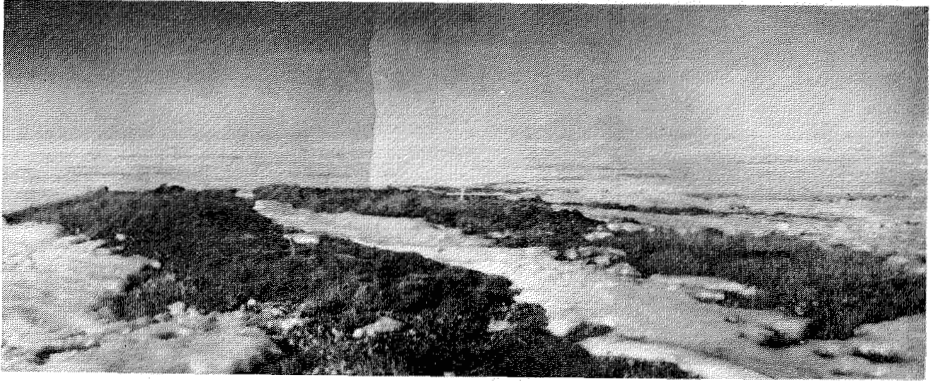


Fig. 13. May 17, 1953. Cape Kellett House I at the beginning of excavation.

Satsik (farthest north), and, after an unsuccessful attempt to reach the mainland via Nelson Head in the spring, they were taken to Baillie Island by the Eskimos in the summer. (Eskimo report; MacBrien, 1932, pp. 104-5.)

The Eskimos on Banks Island

Stefansson (1921a, p. 363) recorded Eskimo ruins at Cape Kellett. This village is gradually being washed away as the bank on which it stands is eroded by storm tides. There are now eight houses left, of which one was partly dug in 1952 by a party from the U.S.S. *Burton Island*. Two others were dug by us in 1953. The artifacts obtained are of the Thule type. The house dug by the U.S. party (House III) and one (House I) of those dug by us were larger than the remainder (the inside diameter of House I was 6.7 metres), had a greater thickness of roofing material, and wood rather than whalebone roof supports. It is possible that some of the roofing material and supports had been removed from the whalebone houses to build the others, but there was no other obvious indication that the larger houses were younger. None of the wood in House I was sufficiently large or well preserved for tree ring¹ dating, but sections of a few of the more likely pieces from House III were sent to Dr. J. L. Giddings, who has kindly provided me with the following information in a letter dated September 24, 1954. Only two samples, both spruce, were suitable for dating. BIM 1 lived from 1191 to 1466 A.D., and BIM 2 from 1094 to 1468 A.D. or possibly a little later, as a few of the outermost rings may have been rubbed off. The two sections had about the same diameter but differed greatly in age and could not, therefore, have come from the same tree. The dating is dependent on a single long-lived tree (600 rings), the only specimen of this age from the Mackenzie. Assuming that the logs were used for this house soon after the death of the tree, the house would be just under 500 years old. The other houses remaining at the site are probably slightly older. This agrees with the estimate of 500 years made independently from their general state of preservation.

¹Perhaps some had been removed to build House III.



Fig. 14. One of the better preserved Thule houses 16 miles southeast of Sachs Harbour. In the distance can be seen the ridge on the north side of Sachs River.



Fig. 15. The larger of the two Thule houses near Cape Cardwell. Note bare polygonal ground surrounding the house and the frost crack running through the house.

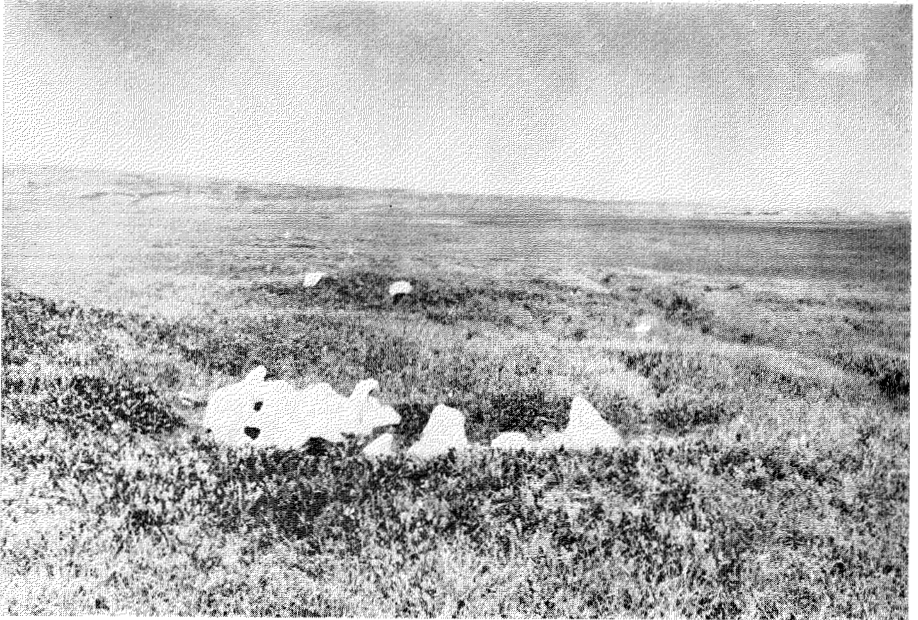


Fig. 16. Looking north along the row of Thule houses 2 miles south of Nelson River.

In 1952, we found two similar houses above the cliff about 15 miles southeast of Sachs Harbour and a group of eight a mile farther away. Another two houses were found towards the east end of the Cape Cardwell cliffs, and a group of five, possibly more, in what is now a very marshy area about 2 miles south of Nelson River. The two houses at Cape Cardwell and two of those at Nelson River were excavated and also produced Thule artifacts. The former houses were constructed chiefly of wood and may be slightly younger than the Kellett houses; the latter, built chiefly of whalebone, may be slightly older. The group, also probably built with whalebone, above the cliff southeast of Sachs Harbour are of about the same age or only slightly older than those near Nelson River, but, whereas the latter are only just above the level of storm tides, the former are 60 feet above sea-level and are separated from the sea by a steep cliff (See Fig. 47). It is hardly possible that there has been a significant sea-level change between the building of the two groups, and presumably those above the cliff were placed where a good look-out could be kept for whales. However, the cliff must then have been more sloping or a nearby gully may have given access to the beach.

Towards the end of May 1851, Lieut. Haswell met a party of 18 Eskimos near Cape Berkeley on Victoria Island (M'Clure, 1854, p. 39; Osborn, 1856, p. 185). A few days later they had moved 10 miles to the north, and on June 2 or 3, M'Clure and his interpreter, Johan Miertsching, met them encamped on the Victoria Island side of Prince of Wales Strait about 60 miles south of Princess Royal Islands. These Eskimos were familiar with the coast of

Victoria Island as far as Dolphin and Union Strait, and said that it was thickly populated. However, they thought there were no people living to the north; neither did they themselves go farther in that direction or even have legends of their ancestors having done so. (M'Clure, 1854, pp. 39-40, 59.) Although no mention of Banks Island is made in this account, the inference is that these Eskimos knew little or nothing of it, for M'Clure would almost certainly have inquired about the region to the west of Nelson Head, which was then totally unknown. Some or all of the group of 18 Eskimos seen by M'Clure were among those, totalling not more than 50, whom Collinson met at Walker Bay, and these, Collinson (1889, pp. 172, 222) says, ". . . were the northernmost portion of the tribe, as beyond the parallel of 72°10'N.¹ in the Prince of Wales Straits, we met with no recent traces of them on Prince Albert's Land." (i.e., Victoria Island.)

Figs. 17-21. These figures show a selection from the 348 artifacts obtained from the Thule houses excavated in 1952 and 1953. A few artifacts were also picked up on the beach below the houses, which are being eroded by the sea at Cape Kellett. Together, they occupy National Museum of Canada catalogue numbers IX-C 6112 to 6120, 6195 to 6303, OLRQ1-1-244. The National Museum also has the collection obtained by personnel from the U.S.S. *Burton Island*. Presumably these all came from Cape Kellett, but, because there is no proof of this, none have been included in the figures. Except as specified below, all the artifacts illustrated appear to be made of caribou antler. Whalebone was commonly used for larger objects. Artifacts made of driftwood, which is plentiful, are naturally more often found than in the Eastern Arctic Thule culture, but it is difficult to see how the wooden harpoon heads could have been used without immediately being broken. Probably they were toys or models, although they are of an unusual shape. The Nelson River Valley houses had originally stood on a pebble beach, but both before and after their roofs had collapsed the spring flooding of Nelson River deposited a considerable quantity of vegetable material in and about them, so that they are now situated in a peaty marsh. The peat has stained the antler and bone artifacts from the floors of the houses a deep chocolate-brown, which, if the cause were not known, might be taken to indicate age. A few antler objects from Cape Kellett, particularly from House II, are also stained, although less deeply.

There is probably no soapstone on Banks Island. In its stead a coarse, friable pottery was used, shards of which were common at all sites. They were too broken and scattered, perhaps by frost action, to be put together, but a representative sample was preserved. Part of a boot, and other pieces of stitched sealskin clothing at Cape Kellett House I have also been preserved. Pieces of slate with one edge ground were common. Some of these are evidently broken ulu blades; others appear never to have had any definite form. The slate, usually grey but occasionally reddish, was presumably obtained from the Precambrian at Nelson Head.

At Cape Cardwell House I (1952), two 25/35 cartridges were found just above the permafrost layer. As there was no other sign of European influence, it may be inferred that they had been discarded by later hunters, perhaps hiding behind the house ruin while caribou hunting, and had worked their way down through frost cracks. This is evidently one way in which recent material may be introduced into an old site. Both the Cape Cardwell and the Cape Kellett houses had been greatly disturbed by frost action, and this, together with the lack of rocks in the construction (there were, for instance, only about 200 lbs. of stones in the large Cape Kellett House I), made it difficult to determine the form of the houses.

Detailed notes of the excavation and of the origin of the individual specimens are deposited in the National Museum.

¹That is to say, 15 or 20 miles north of where M'Clure met the party of 18.

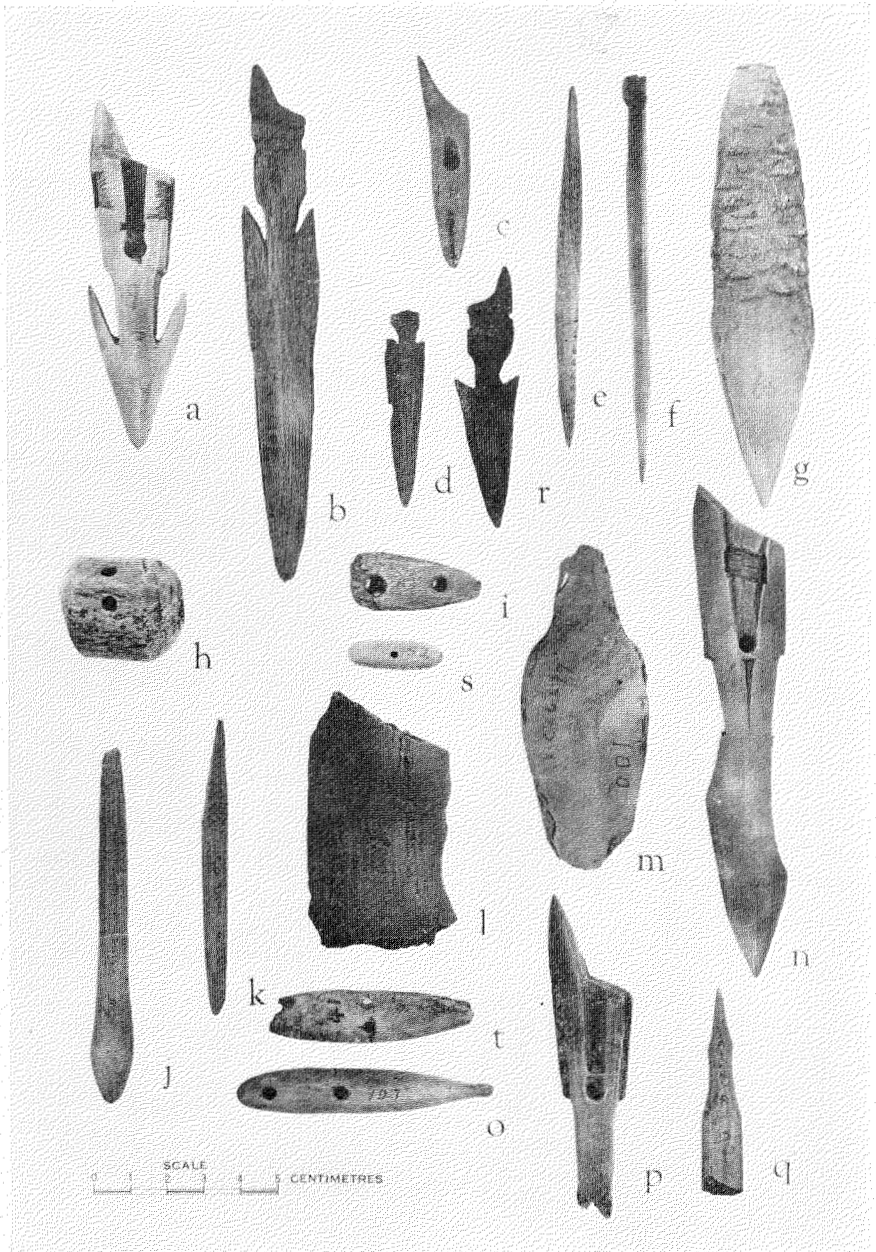


Fig. 17. **a-i** and **r-t** were from House I (1952) at Cape Cardwell; **j-l** and **q**, from House IV (1952) in the Nelson River Valley; and **m-p**, from House III (1952) at the same place. **a, c, n, p**: harpoon heads; **b, d, r**: wooden harpoon heads, probably toys or models. **b** has a narrow open socket; the base of **d** has been broken off. **e**: probably an arrow head, perhaps part of a multiple point head. **f**: triangular wound plug. A groove on its under surface extends through the head and about 5 cm. down the body. **g**: ice-pick. **h**, bolas ball of antler. **i**: possibly a toy dog trace toggle. **j, k**: probably arrow heads. Both have scarfed tangs. **l**: part of a snow knife. **o, t**: fish lures. **s**: probably a small toggle. **q**: probably the tang of an arrow head. **m**: knife blade, slate.

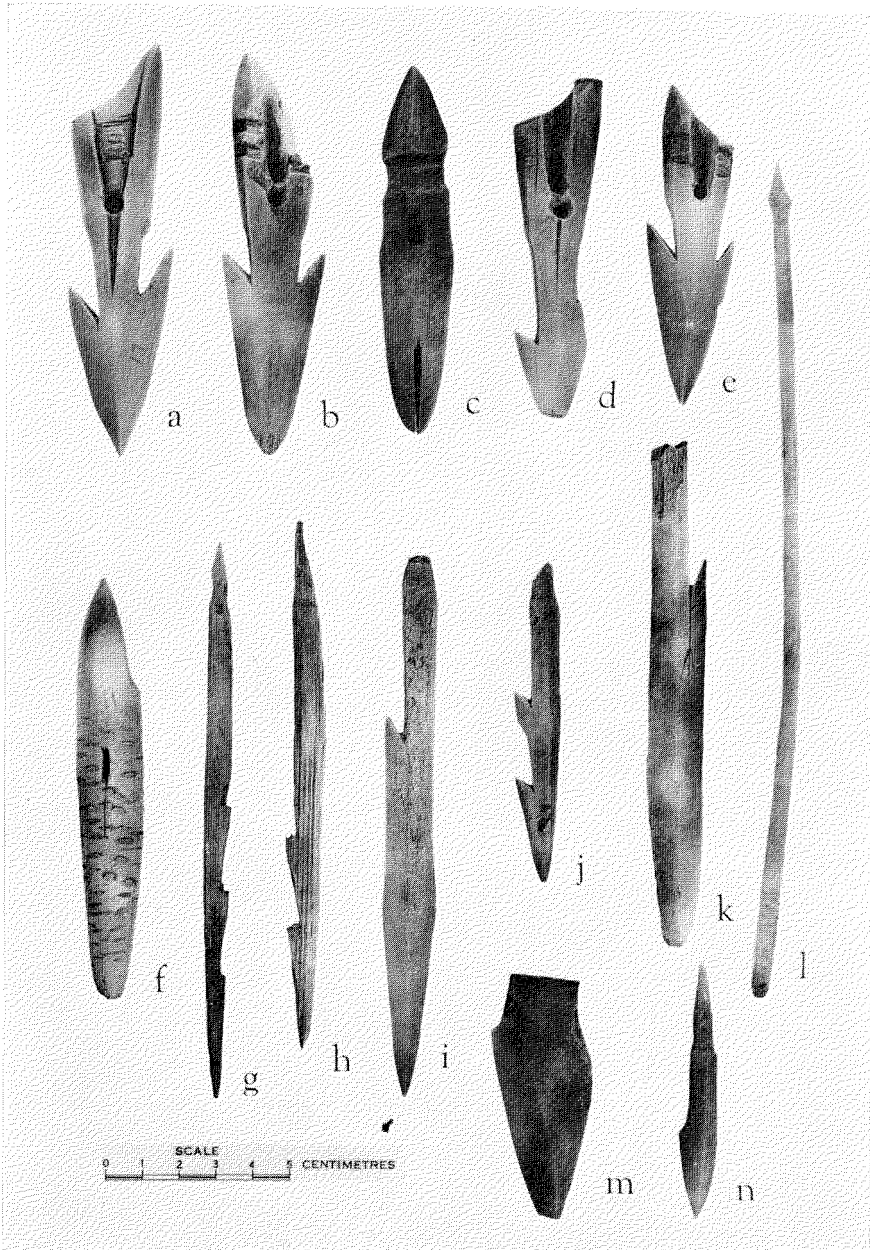


Fig. 18. All from House I (1953) at Cape Kellett. **a-e:** harpoon heads. **f:** probably an ice-pick. The upper end appears to be the point, but it is the lower which is worn. **g, h:** apparently arrow heads of wood, possibly toys. **i, n, k:** arrow heads. **j:** side prong for a bird dart. Tang broken. **l:** probably the lower part of a snow probe. The point is at the top and the lower end is scarfed. **m:** knife blade, slate.

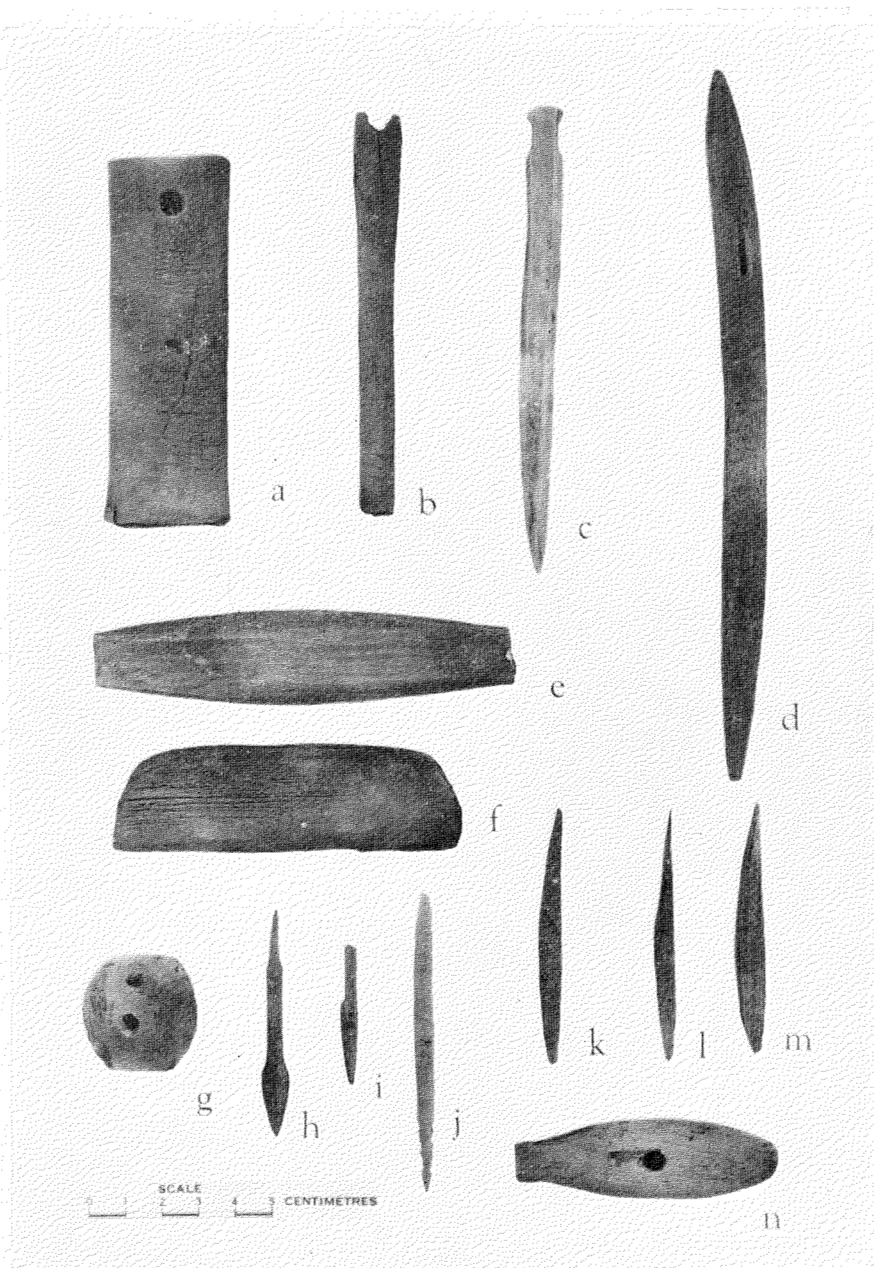


Fig. 19. All from House I (1953) at Cape Kellett. **a:** knife handle. **b:** proximal end of wooden arrow shaft. **c:** wound plug, probably caribou leg bone. **d:** harpoon fore-shaft, whalebone. **e:** an antler object of unknown use. The ends may have been cut off. A similar object with one broken and one tapered end was found in House I. **f:** ulu handle, wood. **g:** bolas ball. **h, i:** wooden arrow heads, toys or for small birds. **j:** probably the centre point of a bird dart. **k, l, m:** probably arrow heads. **n:** whalebone fish lure.

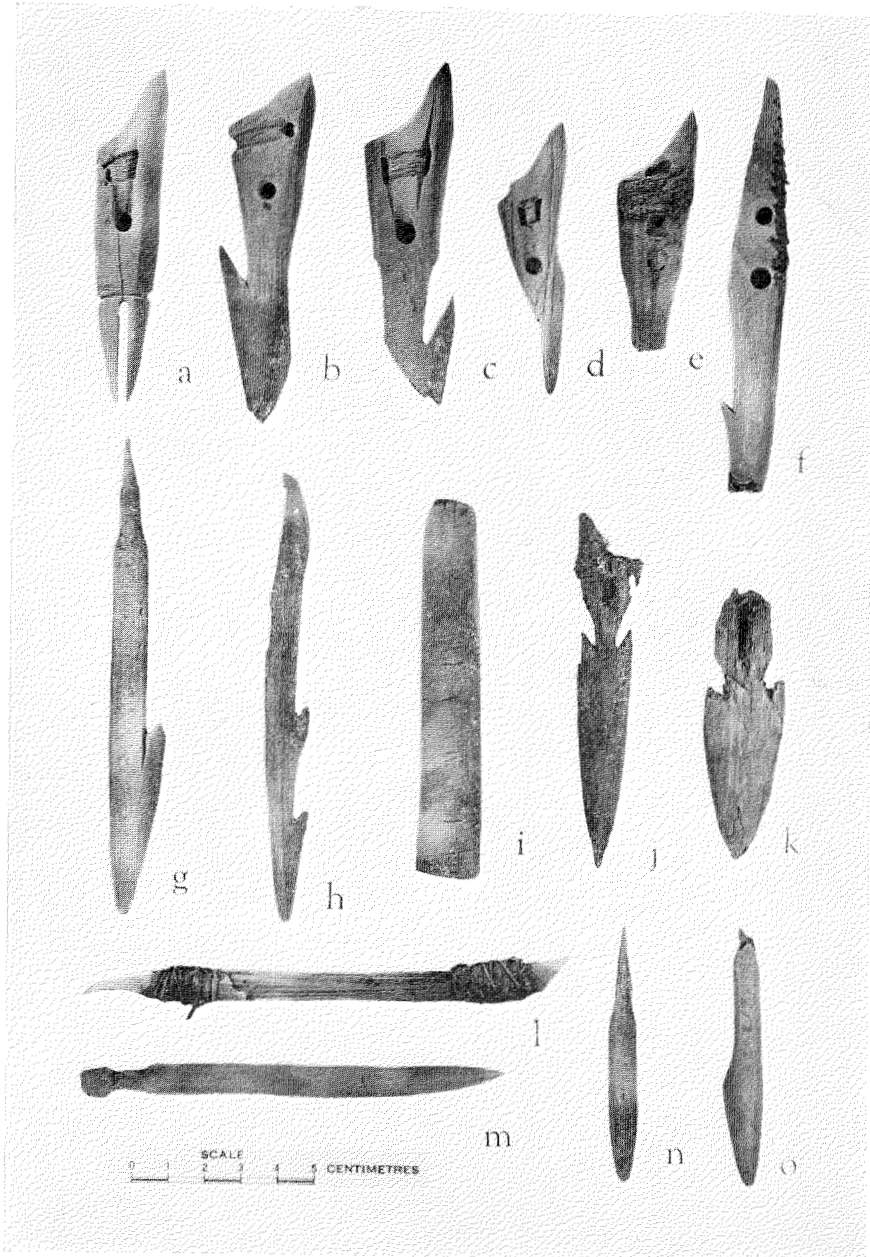


Fig. 20. a-c, f-o, from House II (1953) at Cape Kellett. d, e, from House III (1953) at Cape Kellett. a-e: harpoon heads; e still retains its lashing of sinew. f: probably a side prong for a bird dart. g, n, o: arrow heads. h: side prong for bird dart. i: knife handle. j, k: wooden harpoon heads, probably toys or models. l: double-ended graving tool. Split bear tooth points are lashed to a wooden handle with baleen. m: wound plug without groove.

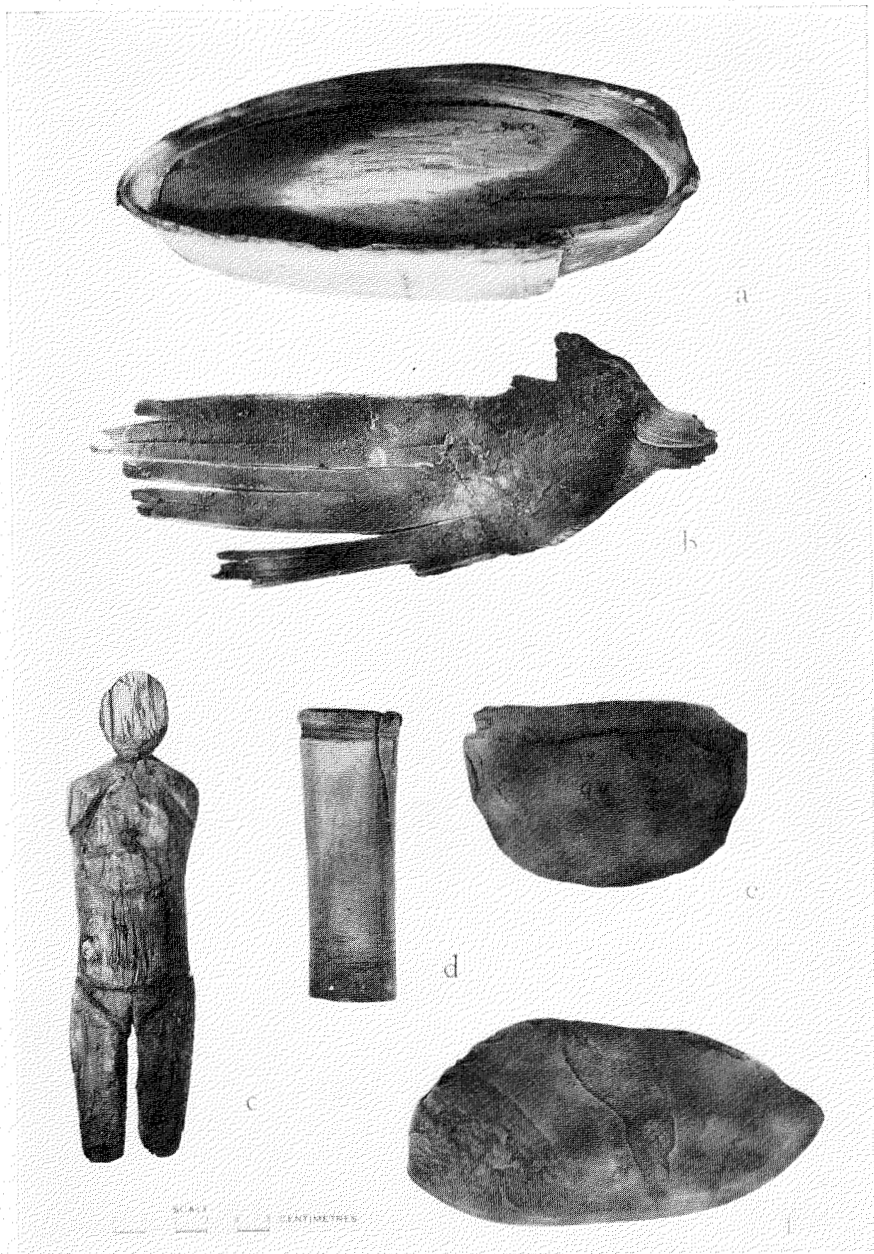


Fig. 21. a, c, d, f, from House I (1953) at Cape Kellett. b, e, from House I (1952) at Cape Cardwell. a: oval wooden vessel. The ends of the bent wood side are stitched together. The baleen sides of two larger vessels were found in House I at Cape Kellett. b: wooden ladle. c: wooden figure. The face has been broken off. d: collar for harpoon shafts. e: ulu blade of grey slate. f: ulu blade of reddish slate.

The existence of Thule remains is clear evidence of an early Eskimo occupation of Banks Island, but neither M'Clure nor Collinson saw any Eskimos on the island, and none of the accounts of their expeditions mentions recent traces of Eskimos, although there are frequent references to older remains (e.g., M'Clure, 1854, pp. 40-1, 46, 51; Osborn, 1856, p. 186; Armstrong, 1857, pp. 325, 417; Collinson, 1889, p. 156), including what appear to have been house ruins near Ballast Beach on the north coast and on Mottley Island (but *See* p. 9). When this is coupled with information obtained by M'Clure from the Eskimos in Prince of Wales Strait, there is a strong presumption that Banks Island was uninhabited at the time of M'Clure's and Collinson's expeditions, and probably had not been inhabited for many years previously, possibly not since the Thule houses were occupied. Stefansson (1921a, pp. 256, 362, 367), during his summer journeys across Banks Island between 1914 and 1917, found numerous Eskimo camp sites, but concluded that few if any, excepting the Cape Kellett (Thule) houses, were over 100 years old, and at at least three out of four camp sites there were wood chips similar to those at M'Clure's depot at Mercy Bay.¹ This led Stefansson (1921a, p. 256) to infer that the Eskimos on Banks Island at the time of M'Clure's expedition could not have been numerous, but it may also be taken as additional evidence for an uninhabited period.

In 1911 at Prince Albert Sound Stefansson met Pamiungittok, the only man then living who had seen Collinson in Walker Bay in 1852. At that time Pamiungittok had been about 8 years old. Stefansson (1913a, pp. 287-90) quotes from his diary of May 16 and 17 giving the information he obtained from Pamiungittok. The passages relevant to Eskimos in Banks Island and northwest Victoria Island are as follows:

"... At that time [of Collinson's wintering] there were numerous people beyond (north of) Minto Inlet. He [Pamiungittok] has never heard more than one name for these people—Ugyugligmiut. He has heard that they attacked a ship (what ship?) and killed some white men. The white men then shot them down with guns and killed the last one. This he has heard; what he knows is that there are no people now beyond Minto Inlet—they are all dead, for one reason or another. Of the Minto Inlet people (Kanhiryuatjagmiut or Naperagvigmiut) there are now only four families, though they were once numerous, and one of these four families is really a Prince Albert Sound family moved over (to Minto Inlet).

"There were numerous people once resident in Banks Island summers, and on the ice near it winters. These are all dead—some of hunger in (or near) Banks Island and the last party on the ice of the mouth of Prince Albert Sound—these last died 'because they had no food for their stomachs and because they had no oil (for fuel) to make water with.' There are many stone houses here and there, chiefly between the Sound and Minto Inlet. These were not built by 'the forefathers of our countrymen', but by the *turnmrut* (spirits) long ago."

"In the fall they (the Kanhirgyuargmiut) come to Prince Albert Sound and proceed to Banks Island where in winter they live chiefly on bears (some entirely; others partly on seals) off Nelson Head and east of it. When bear hunting they often see Cape Parry (on the mainland to the south). Nelson Head can be seen from Parry only from the hill tops, and that rarely, and it is much higher than Parry, so they must hunt almost to the middle of the strait."

¹I picked up a piece of painted mahogany at the large camp site on a hill about a mile northwest of the junction of Muskox and Thomsen rivers. There were about 200 muskox skulls about the site, and more could be seen on the hills round about.

"Pamiungittok tells: The Banks Island people used to be well off. They killed so many deer and (musk) oxen that their dried meat sometimes lasted the year round. They got to killing each other. One man killed had relatives in the Sound. For this reason (i.e., because of witchcraft practised by the dead man's relatives in the Sound) food became scarce (in Banks Island); there were no seals for food or fuel and the people died of hunger—those that had not been murdered in the feuds. This happened some fifteen years ago—i.e., when Agleroitok (who is now about twenty-five) was a boy but (after) his two brothers (were) grown up."

In the above quotation Pamiungittok distinguishes between what he knew and what he had heard, and the latter, that is to say, the existence of numerous people, the Ugyugligmiut, north of Minto Inlet at the time of M'Clure's expedition and Collinson's is so at variance with their accounts that it must be dismissed as legendary or referring to some other place or time. What Pamiungittok *knew* offends no historical account providing it is assumed that the Banks Island people who died were some who had remained to hunt on the island after visiting M'Clure's cache at Mercy Bay, a supposition which is strengthened by the absence of any Eskimo name for them in any of Stefansson's accounts (1913a, 1913b, 1914-19). The Prince Albert Sound Eskimos also told Stefansson that a year or two after the *Investigator* and M'Clure's depot at Mercy Bay had been abandoned, these were discovered by a large tribe of Eskimos which "occupied the eastern side of Banks Island up to well within the memory of people now living". Later, other groups, including the Prince Albert Sound Eskimos, used to make trips to Mercy Bay to plunder the ship and depot (Stefansson, 1913b, p. 457). It was about 1890 when the last party thought it worth while to visit the depot, the *Investigator* having previously sunk or drifted away (Stefansson, 1921a, p. 361).

As there was clearly no large group of Eskimos living on Banks Island when M'Clure wintered off the Princess Royal Islands in 1850-1, it appears probable that the *Investigator* was found by the Prince Albert Sound or Minto Inlet Eskimos whom M'Clure met near the south end of Prince of Wales Strait and Collinson traded with at Walker Bay, and for whom Meham (1855b, p. 699) left a package of knives near Cape Beechey. M'Clure (Armstrong,

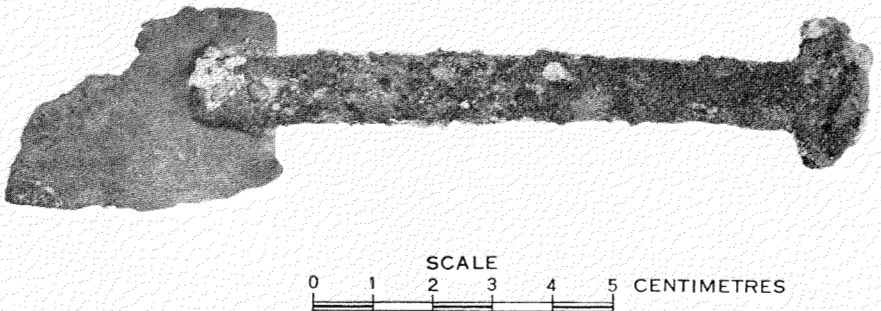


Fig. 22. This knife was picked up at the site of M'Clure's cache on August 9, 1953. The iron blade was almost certainly made from one of the barrel hoops and shows the deterioration that has taken place in about 100 years of surface weathering. Lichen is growing on the antler handle. National Museum of Canada specimen number QAPT1.



Fig. 23. July 3, 1953. An Eskimo shack at Sea Otter Harbour. It consists of a wood frame covered with canvas or caribou skins. About 10 years ago Sea Otter Harbour was one of the main Eskimo settlements. There are several recent graves on a nearby hill.

1857, p. 341) invited those he met to visit the *Investigator* at the Princess Royal Islands, and it may well be that in 1854, after finding Mechem's package, they followed his tracks northward in search of further booty, some of which they would soon have discovered in the form of M'Clure's whaleboat and depot at the Princess Royal Islands.

In 1911, and apparently for some years before that, a few Victoria Island Eskimos spent part of the winter, probably March and April, on southern Banks Island in the Nelson Head and De Salis Bay region living chiefly on bears and seals (Stefansson, 1913a, pp. 281, 289, 294; 1921a, p. 287), and in 1915, three families of Eskimos came from Victoria Island to trade with the Canadian Arctic Expedition. At least one family visited the Kellett base (Stefansson, 1921a, p. 370). There is no published information after that date, but according to the Tuktoyaktuk Eskimos, the Victoria Islanders have continued to hunt on Banks Island occasionally, and sometimes to winter at De Salis Bay.

In 1916, Pedersen (1953) landed Peter Konungnoora, his family, and another Eskimo trapper, all from Point Hope, Alaska, at Masik River (cf. Masik and Hutchison, 1935, p. 118), where they stayed until he picked them up again in 1919. In 1917, Natkusiak and some other Eskimos who had been working for Stefansson purchased the *North Star* and remained for 2 years in northeast Banks Island (Stefansson, 1921a, pp. 611, 653). They were finally

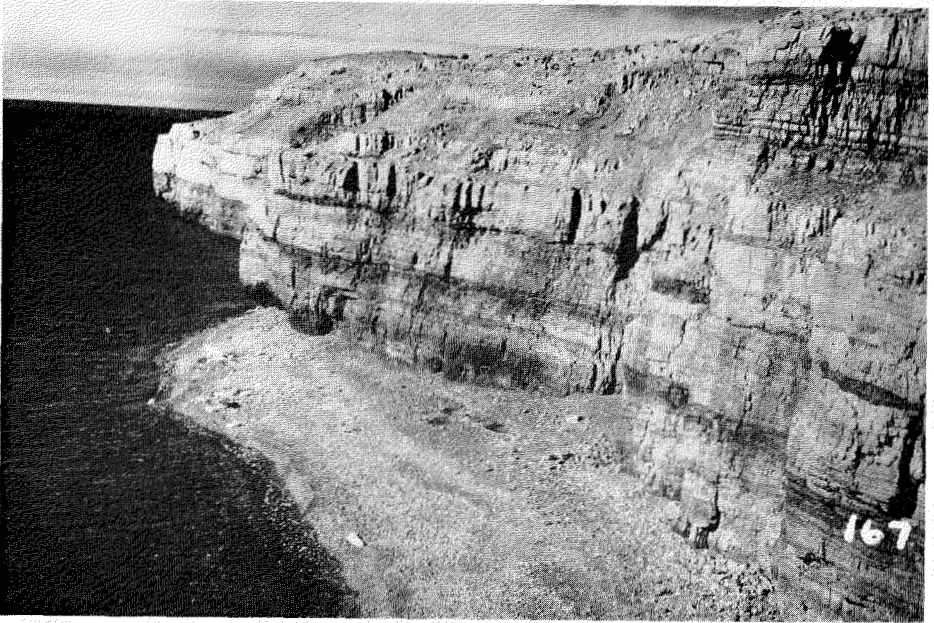


Fig. 24. July 28, 1952. The limestone cliffs to the east of Cape Lambton. These cliffs are only about 50 feet high. Above them is a moderately level terrace behind which the land rises steeply to Durham Heights. The total visible thickness of the limestone was estimated to be about 200 feet. It dipped gently eastward, apparently going below the quartzites. The actual point of Cape Lambton is just hidden by the end of the cliff. It consists of a triangular-shaped beach enclosing a small lagoon.

picked up in 1921 by Pedersen (1953) at Masik River¹ and the *North Star* was towed to Cape Bathurst.

Most years since 1929, when three schooners owned by Lennie, David, and Old Adam wintered at Mary Sachs, a party of Eskimos from the mainland has gone to Banks Island in their own schooners and spent the winter trapping. The main camp has usually been at Sachs Harbour, where there are two small frame houses, the first of which was built by Fred Carpenter (oral information) in 1937. They also have had camps at Jesse Bay, De Salis Bay, Masik River, and several places on the west coast.

Topography and Geology

With the aid of air photographs annotated for sample regions, it would be possible to describe the topography of Banks Island in infinite detail. Here, however, it is intended to outline only the major features and to draw attention to some peculiarities and problems. The southern highlands are dealt with first; then the coastal areas, as far as structural features permit, are considered counter-clockwise. Unless otherwise stated, the information is derived from

¹According to the present Banks Island Eskimos, Natkusiak visited the mainland during the second winter by dog team, a trip which has very seldom been made owing to the moving ice in Amundsen Gulf.



Fig. 25. June 17, 1952. Part of the basalt outcrop about 200 feet above sea-level near Pass Brook. The hill on the skyline is probably a glacial moraine.

personal ground observation. A full report (Manning, 1954) on the coast-line, with particular reference to harbours and tides, has been prepared for the Defence Research Board, and the relevant information will doubtless be included in a new Canadian *Arctic Pilot* now being prepared for the Defence Research Board by the Arctic Institute. A short description of the topography and vegetation, with rather more detailed notes on the places at which bird observations were made, is given in Manning *et al.* (1956).

From the valley of Nelson River, around Nelson Head, and along the coast northwestward almost to Masik River are exceptionally fine cliffs, which rise in the vicinity of Nelson Head to at least 1,100 feet¹ (See illustrations in Manning, 1953; Porsild, 1950, 1955). They are composed of yellow, white, and red quartzites interbedded with basalt, and, at Cape Lambton, underlain by dolomite. These rocks are probably (cf. Manning and Hattersley-Smith, 1951, p. 19) part of the Precambrian Coppermine series. Their northern border terminates abruptly along the southern edge of the valley of Nelson River. However, a small basalt outcrop about 200 feet above sea-level near Pass Brook is presumably part of the same formation.² The northwestern

¹Aneroid height obtained by Hattersley-Smith (Manning and Hattersley-Smith, 1951, pp. 18-9) from a single section. Porsild (1950, p. 51), who flew along the cliffs, gives the maximum height as 1,500 feet.

²Hattersley-Smith (Manning and Hattersley-Smith, 1951, p. 13, Fig. VII) was deceived in thinking he saw solid rock outcrops west of De Salis Bay. When investigated in 1952, these proved to be the steep-sided moraines shown in Fig. 49.

border of the Precambrian country is less abrupt, and small outcrops of what appeared to be basalt could be seen from the coast almost as far north as the valley of Masik River. A description of the plateau above Nelson Head is given by Porsild (1950, p. 52; 1955, p. 5), who puts the summit, which is undoubtedly the highest point on Banks Island, at 2,400 feet.

North of Nelson River, the rolling plateau country is deeply cut by the broad valley of Masik River and the narrow, steep-sided valleys of its tributaries. The highest part of this plateau is near the head of these tributaries, where it breaks up into a range of hills with a maximum height of 1,700 feet (aneroid). On the east, these hills are bordered by a well-marked scarp, a northerly continuation of that which forms the northern border of the valley of Nelson River. This scarp passes a few miles inland of Cape Collinson, then swings around Windrum Lagoon, and continues north up the west side of the valley of De Salis River. Aneroid measurements gave the height of the pass between the De Salis Bay coast and the southern tributary of Masik River as 1,200 feet, and of the pass between the main tributary and Pass Brook as 900 feet. The pass at the head of Sandhill River, which also leads to the main tributary of Masik River, is probably 300 feet lower.

The hills on both sides of the valley of Masik River are distinctly terraced. In the lower part of the valley this is clearly caused by hard strata lying below the surface and with a gentle apparent dip down the valley. A sample of the surface debris taken from the lower terrace about 4 miles inland at a height of about 450 feet was identified (Fortier, 1953) as shaly limestone. Originally a grey rock, the weathered surface is yellowish red or orange. A sample from a higher terrace has weathered a deeper red and is more ferruginous. The only actual outcrop of hard rock seen in situ was 580 feet above sea-level on the south side of the valley and about 12 miles from the river mouth. Fossils representing the pelecypod genera *Tellina* and *Arctica* were obtained from this. They are not suitable for determining the age of the formation with any certainty, although Jeletzky (1953) thought they might be conspecific with forms from Darnley Bay, Prince Patrick Island, referred to the same genera. Moreover, he pointed out that the rock in which they were embedded was strikingly similar to the Lower Cretaceous sandstone of Darnley Bay (See also p. 48 and Appendix I). A few feet higher and about 100 yards distant from where the pelecypods were obtained is a layer of soft silt, apparently interbedded with the hard, red-patinated rock, and containing small gastropods tentatively identified by Wagner (1955) as *Littorina saxatilis* Olivi.¹ In the lower part of Masik Valley between the terraces of hard rock, and indeed often cutting right through them and therefore on the same horizon, is soft, shaly material which weathers to fine, soft mud. Streams flowing down the sides of the valley through this mud have the consistency of

¹This appeared to be interbedded with the hard, red-patinated rock, and one palaeontologist to whom Miss F. J. E. Wagner (letter dated March 5, 1956) showed the gastropods suggested that there was a vague resemblance to the Lower Cretaceous forms of the family Corbiculidae (=Cyrenidae). However, Miss Wagner can see no reason to alter her opinion that they are referable to *Littorina saxatilis*, a species not recorded before the Pleistocene.

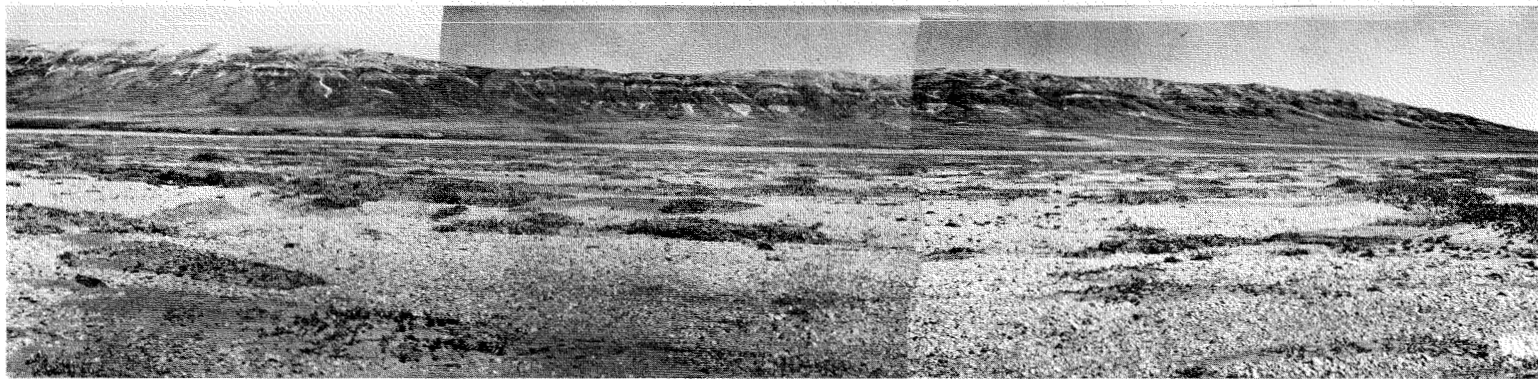


Fig. 26. June 26, 1952. Looking across Masik River and part of its wide, pebbly flood plain to the hills on the southern side of the valley from their western extremity to a point about 10 miles inland. The highest hill visible is about 900 feet. The gentle westerly dip of the underlying strata can be recognized from the surface markings. The pale cap on the eastern hills probably consists of mud, gravel, and stones, possibly of glacial origin. The white streaks on the lower part of the hills are probably thenardite.

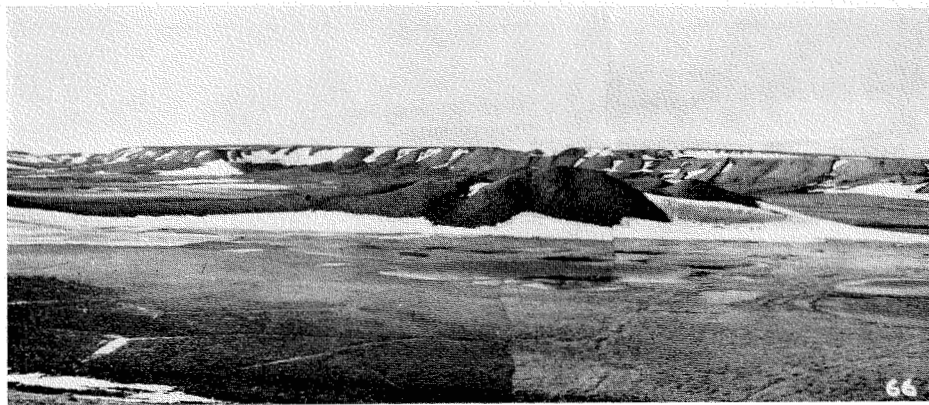


Fig. 27. June 18, 1952. Looking south across the upper part of Masik Valley to some low, terraced hills which from the distance appeared to be composed of gravelly material. This terraced form may be controlled by the underlying strata, as is more clearly the case lower down the valley.

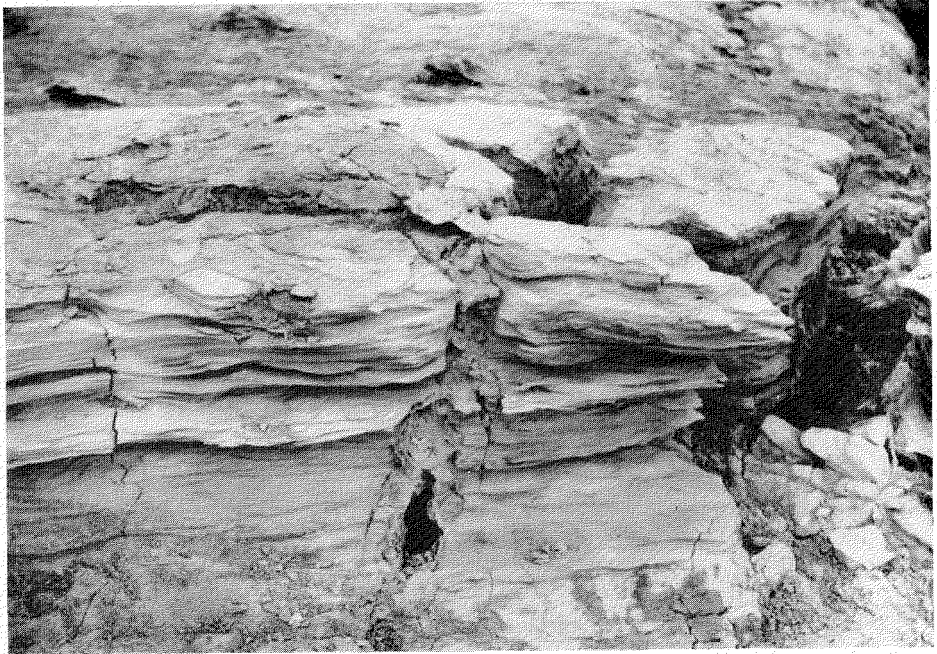


Fig. 28. May 24, 1952. Laminated silt occupying a small area at the top of the northern end of Cape Collinson cliffs. The lamellæ are about 1 mm. thick. The silt forms a sticky mud when wet.

thick soup. Many of them are mere spring freshets which end on the gently sloping valley floor in broad mud outwash fans. The vegetation on the inactive fans, or on the inactive parts of fans, clearly illustrates the gradual development of tussocking from a smooth, uniform layer of vegetation to a form resembling that illustrated by Manning (1953, Fig. 7). If these fans were marked and photographed they would provide natural experimental plots for measuring the speed of the tussocking process. On hill shoulders or steep banks the mud dries out to a light, fluffy material resembling humus, and often supports a rich growth of flowering plants. The soft shales with their attendant mud slopes are also well developed on the north side of Nelson River Valley and on the lower slopes of its south side. In both places angular pieces of the hard red rock mixed with mud are clearly derived from buried strata. Two small outcrops of this hard rock were actually seen a few miles inland on the south side of the valley some 150 feet above the river and thus immediately below the scarp of the Precambrian Durham Heights. In some places, particularly in the Masik Valley where thaw water streams have run over the mud or where pools of water have sat and later dried up, a powdery, white deposit is left on the surface. This proved to be thenardite, Na_2SO_4 (Fortier, 1953).



Fig. 29. July 3, 1952. Part of the Cape Cardwell mud cliffs, baked by the sun to a rock-like consistency.

In the vicinity of Cape Collinson, Cape Cardwell, and Alexander Milne Point, cliffs reach a maximum height of about 80 feet. They are composed of crossbedded, evidently shallow-water deposits of mud, gravel, sand, and pebbles (Manning and Hattersley-Smith, 1951, pp. 15-6). At Cape Cardwell, the mud, which in summer bakes to rock-like consistency, predominates. The age of the deposit cut by these cliffs is doubtful. The small fragments of coal we found at Cape Cardwell appeared to be of secondary origin, but one of the Banks Island Eskimos, Charlie Gruben, told us he had seen a fair quantity of coal there a few years before. This must be the deposit 'about 5 miles southwest of De Salis Bay' reported to Washburn (1947, p. 42). A seam, nearly a foot thick, of very broken, crumbly, sub-bituminous, pre-Pleistocene (Fortier, 1956) coal, lying above white sand was exposed in a small gully about 6 feet from the cliff top a little north of Alexander Milne Point. At the bottom of the gully were less crumbly pieces. The Banks Island Eskimos also told us of an exposure of 'good' coal associated with white sand in the cliff near Schuyter Point. Some of them when living at Jesse Bay, and perhaps at De Salis Bay, appear regularly to have used this coal, which is doubtless the same reported to Washburn (1947, p. 42) as being about 20 miles north of De Salis Bay. Cliffs which, judging from the air photographs, are similar to those at Cape Collinson, Cape Cardwell, and Alexander Milne Point, continue northward with a few breaks to a little beyond the point east

Fig. 30. September 1, 1953. A fairly typical section of the northern part of the east coast of Banks Island. This view was taken 12 miles north of Princess Royal Islands.

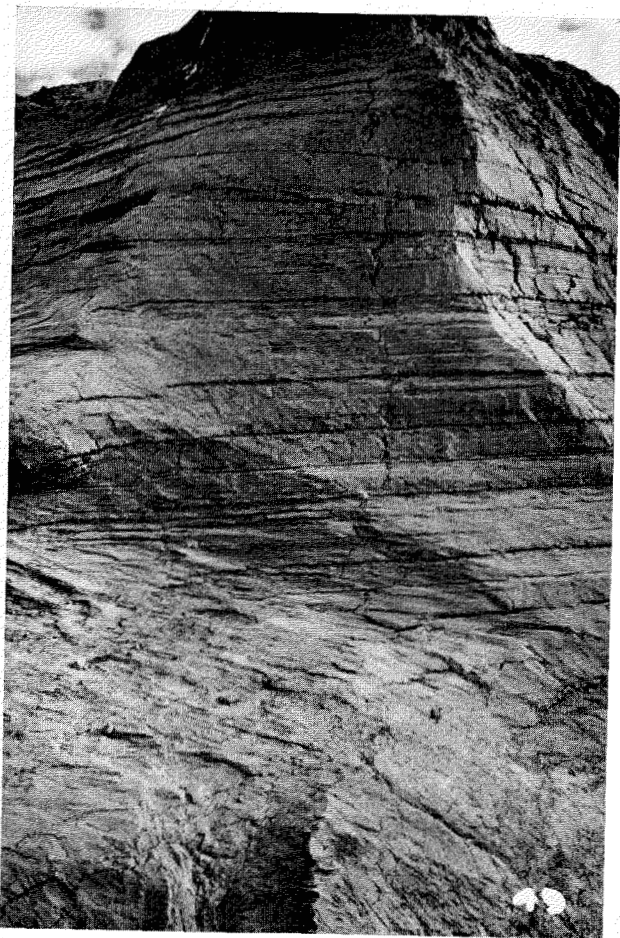


of Jesse Bay. North of there steep slopes and small cliffs occur only where a hill shoulder has recently been cut back by the sea.

From the valley of Nelson River, around De Salis Bay, and northward at least to Alexander Milne Point, the land is low for the first few miles inland. Behind this low land lies an uneven sloping scarp which borders gently undulating plateau country with a maximum height near its southern edge of about 1,400 feet. Towards Jesse Bay the plateau, at least near the east coast, becomes more broken and hilly. This type of country continues to Russell Point. In the De Salis Bay region at least both the slope of the scarp and the plateau above are well covered by a till-like material, and some of the smaller hills along its edge are clearly glacial deposits, but it is reasonable to suppose that below this there is the same rock formation as in the Masik River Valley, and indeed, it is only the valley of De Salis River that divides the two plateaux.

The main feature of the northeastern part of Banks Island is a plateau of hard sedimentary rock some 2,000 square miles in extent. Its southern border may not be well marked, but, starting south of Mercy Bay and

Fig. 31. June 10, 1952. Part of a small exposure of silt with occasional thin layers of gravel 720 feet above sea-level at the edge of the hills to the northeast of De Salis Bay. This was the only exposure of bedded material seen in these hills. It could be either a superficial deposit or an outcrop of the underlying formation. It resembled the silt containing thin layers of coal and wood at a height of 850 feet south of Masik River.



running north past Gyrfalcons Bluff to Cape Vesey Hamilton, there is a distinct, if rather irregular, scarp. From Cape Vesey Hamilton southeastward, the coast is bordered by steep scree slopes topped with near-vertical cliffs. At Pim Ravine the combined height of these is about 800 feet, after which they gradually get lower, until about 10 miles northwest of Parker Point they end with a height of about 200 feet. The plateau, which probably has a height of 1,000 to 1,500 feet (cf. Porsild, 1950, p. 52), has been deeply cut by comparatively small streams. These have formed steep-sided, flat, stony-bottomed ravines, with stony outwash fans at the coast. The dominant rock appeared to be a coarse, rather fissile sandstone, but there is also some limestone, as well as beds of soft, shaly material. On the floor of the two small ravines just west of Cape Vesey Hamilton, pieces of an extremely hard, and probably rather impure, sub-bituminous coal are numerous, and in the ravine nearest the cape a small seam about 4 inches thick was seen. Similar coal was abundant



Fig. 32. July 2, 1952. Looking west from near the centre of the lagoon east of De Salis Bay along the beach, which continues as a spit to form the south side of De Salis Harbour. In the distance are the hills to the west of the bay. The beach consists of sand and pebbles up to about 3 inches across; below the surface there was rather more fine material. On June 5, permafrost was $1\frac{1}{2}$ feet below the surface. The beach top is about 6 feet above the normal high tide, but occasionally storm tides have carried driftwood across to the landward side.

in Pim Ravine, where two seams about 8 inches thick outcropped some 2 miles inland on the north side of the valley a few feet above the stream. The best we could find at either place burned badly in our grateless stove, but from the descriptions of Domville (1855, p. 673), Krabbé (1855b, p. 713), McMillan (1910, p. 466), and Morin (1910b, p. 172), there can be no doubt that a much better burning coal also occurs between Cape Vesey Hamilton and the vicinity of Rodd Head. Indeed, Krabbé found pieces that could be lighted by a match. Our failure to see any coal seams while travelling along the coast could be explained by bad weather, but the existence of the large seam 8 to 10 miles east of Cape Vesey Hamilton reported by W. Johnson (McMillan, 1910, p. 466) seems unlikely, as it is not mentioned by any of the others who travelled along the coast, including Green (1910), under whom Johnson was serving. As Porsild (1950, p. 51) obtained Devonian fossils from Gyrfalcon Bluff (*See Manning et al.*, 1956, pl. VA), which is clearly an isolated remnant of the main plateau, as well as from an outcrop near the mouth of a small river¹

¹The river that discharges 38 miles south of Russell Point appears from the air photographs to fit Porsild's description.



Fig. 33. June 4, 1952. Looking west along one of the frost ditches which cut the bar between De Salis Harbour and the east lagoon. It is about $1\frac{1}{2}$ feet deep. Similar ditches are common on other partly consolidated beaches about De Salis Bay. Occasionally these ditches can be traced through hummocks of beach material, apparently recently pushed up by sea ice; more usually, however, they peter out in the loose material. A few less regular and less well marked ditches run parallel to the shore.

approximately 30 miles south of Russell Point on the Prince of Wales coast, it seems probable that rocks of this age occur throughout the northeast plateau area and extend below the glacial deposits for some distance to the south. However, Dr. W. H. Easton has tentatively dated specimens of *Tetracoralla* from stream beds along the coast between Russell Point and 30 miles south of there as Pennsylvanian or Mississippian (Carboniferous) (Richardson, 1956).

Ten miles northwest of Parker Point, a wide valley separates the cliffs of the main plateau from others judged to be about 200 feet high and composed of a softer, more shaly material. These cliffs run southeastward as far as Parker Point. Parker Point itself is a large, flat, and probably muddy outwash fan. Similar outwash fans form Passage and Wallace points. Between Passage and Parker points the coast is bordered by a low ridge of extremely sticky mud which is easily distinguishable from the surrounding terrain on the air photographs.

It appears both from our observations and from the records of the *Investigator* (M'Clure, 1854; Armstrong, 1857) that deep water lies only a short distance off shore along almost the whole north coast of Banks Island. Between Cape Vesey Hamilton and Cape Crozier, however, there



Fig. 34. August 16, 1953. Looking up the east branch of the first ravine west of Cape Vesey Hamilton. To the left are beds of hard, fine-grained rock alternating with soft, shaly material. Just off the photograph to the left is a 4-inch seam of hard coal.

are in many places shallow water lagoons formed by stranded ice and by mud that the ice has pushed up. The sudden deepening of the water outside this barrier may result from the scouring action of currents and of the heavy pack. Behind the lagoons there is often a few hundred yards of low, flat land separating the sea from a line of cliffs or steep, sloping banks. These cliffs or slopes are frequently 200 or 300 feet high, and occasionally, as at Mahogany Point, rise to 450 feet. Inland, hills, extending southward to Muskox River and farther south near Thomsen River, rise to a maximum of about 1,200 feet, and in places form small, dissected plateaux. The largest of these plateaux is about 25 miles south of Cape M'Clure. The cliffs and the hills behind them are composed chiefly of thin, soft, laminated shales, some of which break down to the same light, fluffy, humus-like material found in the Masik Valley, but usually without the white encrustation of thenardite. White sand, sometimes partly consolidated, occurs in a few places. The largest sand deposit seen is about 6 miles west of Cape Vesey Hamilton. It is partly consolidated in places, and occasionally interbedded with a fine-grained, red- or orange-patinated rock resembling that in the valley of Masik River. In one place the sand contained pieces of a brown lignite coal differing little, except in colour, from fossil wood.¹ A similar piece of coal, clearly a section of tree trunk, as well as a narrow band of rather shaly coal, were found in sandy silt lying in place below the hard limestone cap of a hill a mile inland from Mahogany Point. Between Castel Bay and Antler Cove are seams of soft, friable coal up to 10 feet thick. These seams contain compressed and flattened branches, and long, frond-like leaves. In the same area are thin, discontinuous strata of the reddish-

¹Small flakes of coal were abundant in the bed of a stream that had a wide valley to the west of the sand deposit, and it appears to have been along the beach in this area rather than below the cliffs to the east that Pim (1855, p. 656) saw numerous pieces of coal and picked up 40 pounds within the space of a few yards.



Fig. 35. August 18, 1952. Looking northwest from a spot about 12 miles southeast of Antler Cove and 100 feet above sea-level. Cape Crozier shows in the extreme distance. Note the shallow lagoon in the right foreground, with stranded ice at the edge of deep water. Farther along the coast is a strip of flat land below the hills. The till-like material in the foreground is common on the hilltops in this area, but absent, at least near the coast, about Antler Cove and westward from there to Cape Crozier.

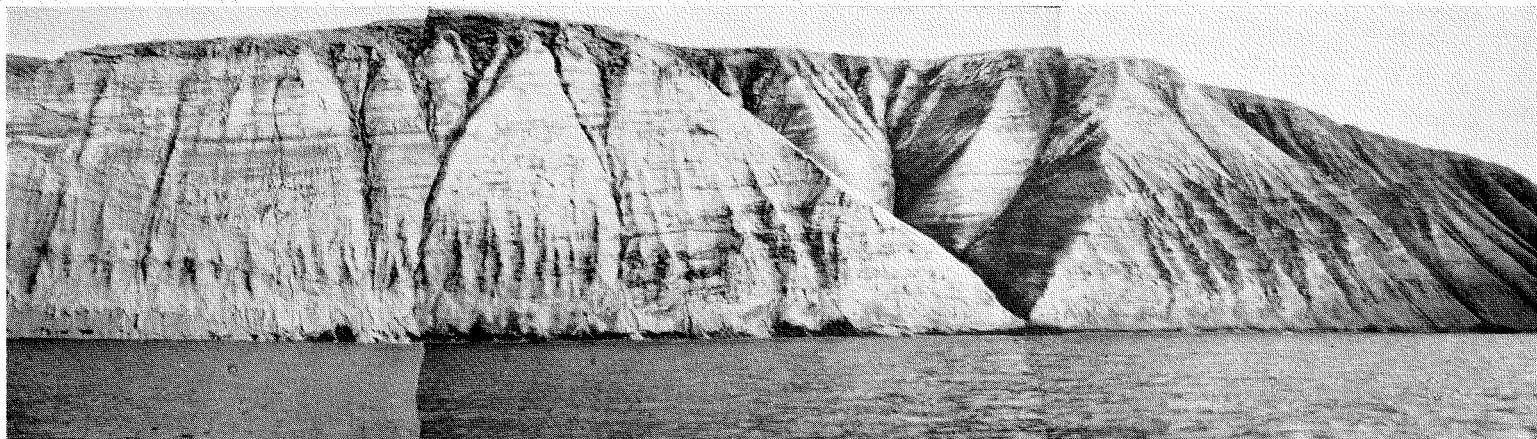


Fig. 36. August 19, 1952. Steep cliffs, estimated to be from 60 to 100 feet high, on the east side of Castel Bay and about a mile from Mahogany Point. They consist of soft shale, fine silt, and mud. It is suggested that the change in the direction of the beds at the left of the picture may have been brought about by an alteration in the currents at the time of the deposition.

Fig. 37. August 16, 1953. Looking southwest from the 560-foot hill behind Cape Vesey Hamilton towards Mercy Bay. The edge of the high land can be seen trending southward, and, about halfway to Mercy Bay, the sand deposit referred to on page 46. Fig. 34 was probably taken near the right hand snow patch. The rocks in the foreground are coated with an inch of ice.



patinated rock. Fossils similar to those from the valley of Masik River and probably of Lower Cretaceous age (See Appendix I) were found in this type of rock between Cape M'Clure and Cape Crozier, and also about 2 miles east of Antler Cove. At the latter place they also occurred in unconsolidated silty material which was exposed only a few feet distant from, and clearly on the same horizon as, the hard red-patinated rock. Although fossils were not found elsewhere in the area, there can be little doubt that the same supposedly Lower Cretaceous formation extends along the coast from just west of Cape Vesey Hamilton to the vicinity of Cape M'Clure and inland at least to Muskox River. Indeed, it may well lie below much of the upland plain of the central parts of Banks Island, and thus be continuous with the Masik River Valley exposure.

The prominent headlands of Cape M'Clure and Cape Crozier are composed of a hard but disintegrating, often shaly, limestone, which also outcrops along the shore to the east as far as Colquhoun Point, but did not, at least near Cape M'Clure and Cape Crozier, appear to extend far inland. At Colquhoun Point the dip is westward about 15° ; at Cape M'Clure, southward about 5° ; and at Cape Crozier, east about

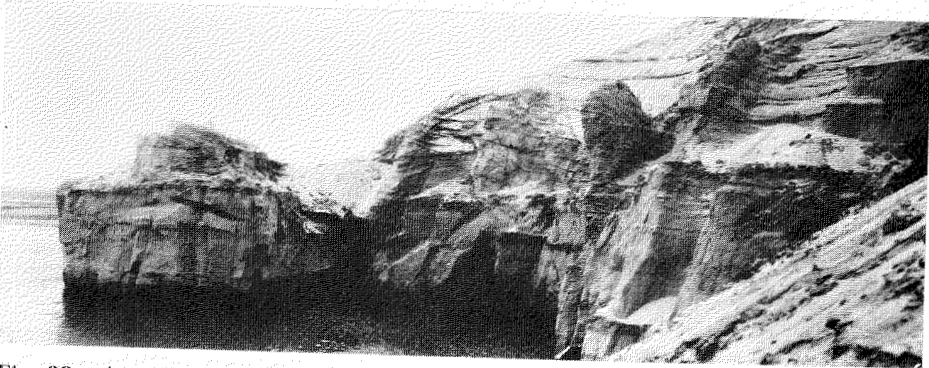


Fig. 38. August 16, 1953. One section of the sand deposit between Back Point and Cape Vesey Hamilton. It was here that pieces of coal were found.

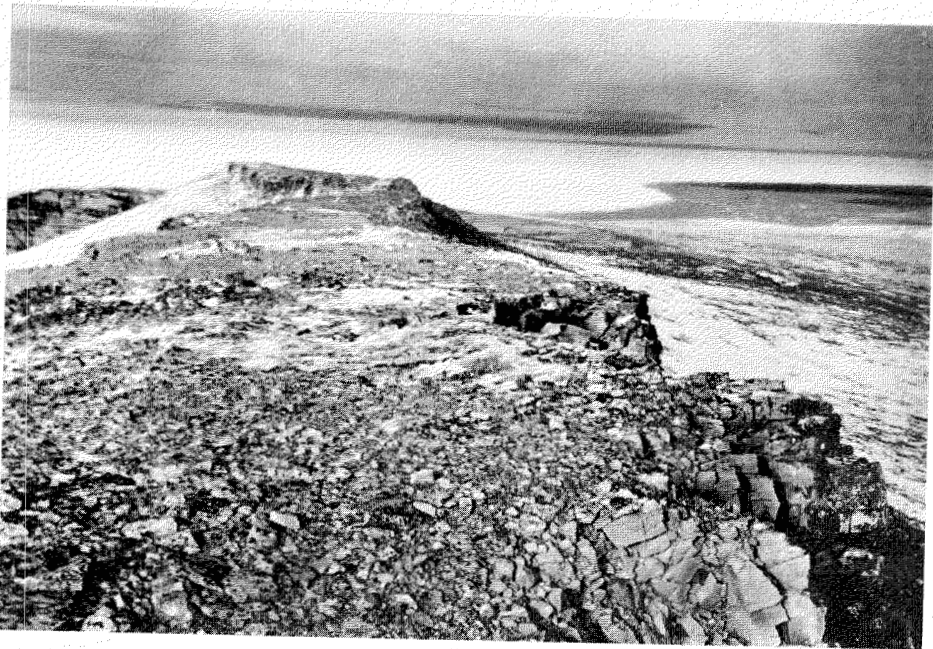


Fig. 39. August 22, 1952. Looking northeast along the hard rock cap of the 460-foot hill about a mile inland from Mahogany Point.

10°.¹ Between Colquhoun Point and Cape M'Clure there was a small anticline in an exposure some 70 feet high. Superficially, the Cape M'Clure and Cape Crozier rocks resemble both the hard rock that caps the Lower Cretaceous strata in the hill behind Mahogany Point, and parts of Gyrfalcon

¹In all cases the dips given in this paper are estimates. At Cape M'Clure and Cape Crozier they are approximately at right angles to the strike; at Colquhoun Point the strike was not determined.



Fig. 40. August 24, 1952. Looking across Castel Bay from an altitude of about 300 feet immediately above the cliffs shown in Fig. 36. In the foreground is a 12- to 15-foot high isolated pinnacle of the red-patinated rock. Obviously it is a hard remnant of a stratum otherwise completely eroded. Similar, though less striking, remnants were common a few miles east of Back Point and also a few miles east of Anchor Cove. They illustrate the great variability in hardness of a single stratum. As they cannot have survived glaciation, this area was either not glaciated, or the surrounding material has been eroded since the glaciation.

Bluff. We saw no fossils at Cape M'Clure (cf. Manning, 1953, p. 187), but Armstrong (1857, p. 528) obtained some at Cape Crozier apparently similar to those he found at Gyrfalcon Bluff (See Washburn, 1947, pp. 29-30). However, from our hurried examination, it was not obvious that the Cape M'Clure formation dipped below the strata carrying the fossils listed in Appendix I,¹ nor that the hard rock of Cape Crozier was on a different horizon from the soft, shaly cliff with occasional hard strata that commenced immediately southeast of the cape and ended in muddy hills a few miles northwest of Antler Cove. Also, near Colquhoun Point some softer beds among the hard limestone were breaking down into the fluffy, humus-like mud common at Antler Cove and in the valley of Masik River.

Immediately west of Colquhoun Point a small river, with a broad flood plain typical of the rivers in the western part of Banks Island, has formed a wide, muddy outwash fan and a shallow lagoon. A smaller outwash fan occurs about 4 miles farther along the coast. In most other places between

¹There may, however, be an unconformity similar to that between the Precambrian and the supposed Lower Cretaceous on the south side of Nelson River.

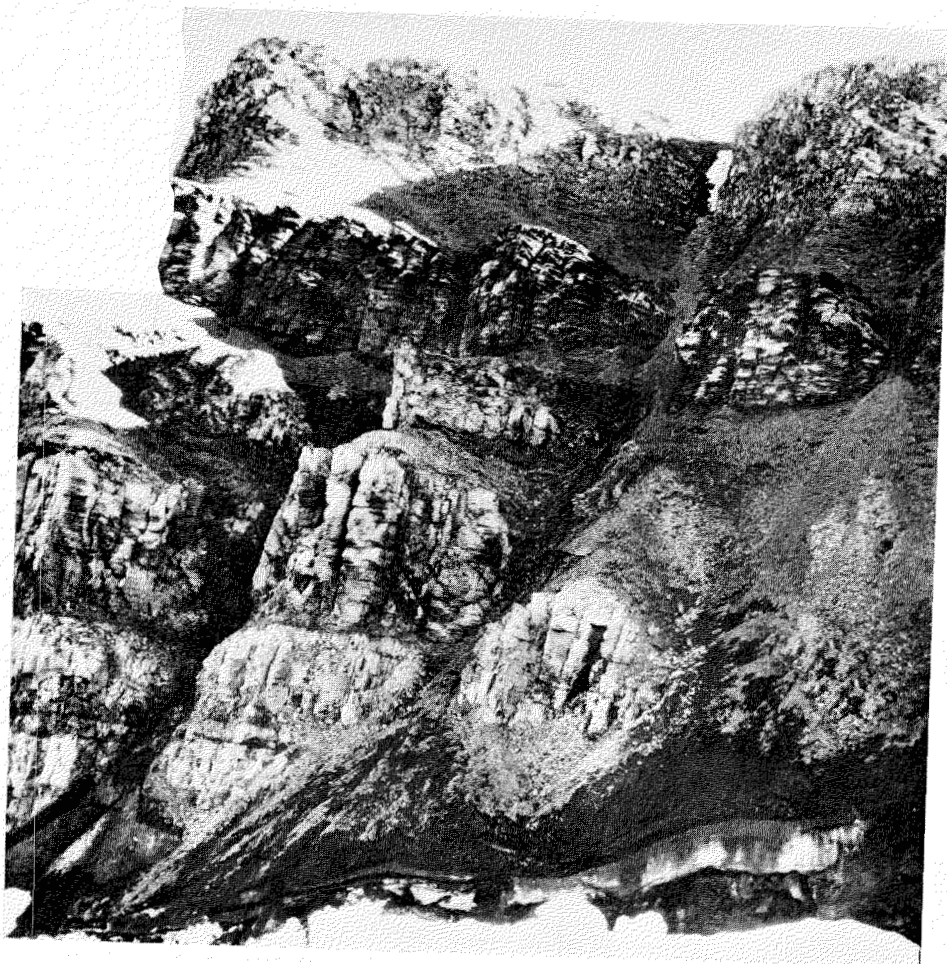


Fig. 41. August 12, 1952. The cliffs near the tip of Cape M'Clure.

Colquhoun Point and Cape Prince Alfred the hills rise fairly directly from the sea. East of Bar Harbour they are composed of unconsolidated, fine-grained silt and mud, sometimes mixed with sand and gravel and occasionally with pebbles and perhaps larger stones. In most places slumping and soil flow have hidden the stratification, even where a hill shoulder has recently been cut back by the sea. However, there are a few exposures from which small pieces of fossil wood to moderate-sized trees protrude. The highest wood noted was about 200 feet above the sea. Farther inland, however, where the wood is apparently more plentiful, M'Clure (1854, p. 46) recorded it up to 300 feet (*See also* Armstrong, 1857, pp. 393-9; Osborn, 1856, pp. 207-9). Most of the hills are capped by a brownish, muddy deposit in which no stratification was seen. It contained a considerable amount of gravel and small pebbles which have accumulated on the surface to give the



Fig. 42. August 12, 1952. Cape Crozier from the northwest.

appearance of almost pure gravel. The lower hills west of Bar Harbour are composed almost entirely of this material, which also caps a few of the hills east of Cape M'Clure as well as some along the west coast of Banks Island.

The west coast is the lowest part of Banks Island. On the outer side of islands and at some of the points where low hills come down to the sea there are small cliffs up to 70 feet high. These cliffs consist of unconsolidated, false-bedded mud and silt, with occasional layers of gravel and stones. They sometimes contain a considerable amount of fossil ice (See Manning, 1953, Fig. 11). Between the points the shore may be quite flat, or there may be a low cut bank. One bank about 8 miles south of Bernard Island appeared from the canoe to consist of $1\frac{1}{2}$ feet of turf and sand over some 2 feet of ice. The cliffs are being rapidly eroded both by storm tides and by the melting of the ice they contain. The finer debris is washed away, and the coarser formed into sand, gravel, and pebble bars extending from the points parallel to the coast or lying in the bays with lagoons behind them. The only fossil wood seen in situ on this coast was a few small pieces in the cliff on an island about 6 miles south of Cape Prince Alfred.

About the northeast branch of Bernard River there is a flat, grassy plain with small, isolated, gravelly hills. Similar country, interspersed with areas of rolling hills, probably occupies much of the central part of Banks Island (cf. Stefansson, 1921). The major rivers rise in the hills near the east



Fig. 43. August 12, 1952. The predominantly soft, shaly cliffs 2 or 3 miles southeast of Cape Crozier. The harder strata are probably calcareous.



Fig. 44. August 11, 1952. The fossil wood bearing hills about 12 miles east of Bar Harbour. The flat land along the shore in the middle distance is the beginning of an outwash fan at the mouth of a river.

coast. Towards the western side of the island they have cut flat valleys often several miles wide. In their upper and central reaches these rivers usually have moderately deep and narrow channels (personal observation; air photographs; Eskimo report). Towards their mouths they are shallower, and flow through braided channels with gravel and pebble beds. Right at their mouths they spread out still farther and become more sluggish, with consequent deposition of mud both within and outside their mouths. The west coast valleys contain many small, shallow lakes, but the ground between the lakes is usually sufficiently raised to be reasonably dry soon after the spring thaw. In some places, as along Masik and Sachs rivers, there are gravelly areas, clearly the old stream beds, up to about 20 feet above the level of the present rivers. From the air photographs (for instance, T422L 86, 100) it appears that some of the streams north of Bernard River have recently changed their courses, leaving wide, flat, dry beds of gravel and pebbles. Dry, well-drained peat deposits up to at least 10 feet thick are also common in the large river valleys. They occur also in other areas, including the plateau south of Masik River, where some were seen about 900 feet above sea-level. Between the rivers flowing to the west coast lie tongues of rolling, hilly country, which, a few miles inland, may rise to a height of about 600 feet. The two most prominent hilly tongues are on the north side of Sachs and Kellett rivers. There they form definite ridges, with moderately steep scarps to the south and more gentle slopes to the north.

At Mary Sachs the ridge that lies along the north side of Sachs River and of Sachs Harbour is cut by a small stream, and to the west of there it has been eroded by the sea to form a 5-mile stretch of cliffs with a maximum height of 130 feet. The highest part of the ridge above the cliffs is 210 feet. These cliffs consist of crossbedded mud, silt, and gravel, with occasional layers of wood debris and numerous small and large pieces of fossil driftwood.¹ Three genera, *Abies* sp. (fir), *Pinus* sp. (probably one of the five-needle pines²), and *Thuja plicata* (cedar), have been identified (Fry, 1954). Pollen analysis of two small samples of silt and plant debris yielded several additional genera. These, according to Terasmae (Appendix II), indicate an interglacial deposit formed in a warmer period than the present. Small pieces of water-worn, petrified wood were found near the base of the long pebble and gravel spit which forms the extremity of Cape Kellett. These, like most of the other material of the spit, no doubt came from the Cape Kellett cliffs. They may be of secondary deposition, but within a small area on the north coast M'Clure (1854, p. 46) and Armstrong (1857, pp. 395-8) found fossil wood including, according to the latter, "Numerous pine cones, and a few acorns" in varying stages of petrification as well as some comparatively fresh wood and some sufficiently carbonized to approach

¹All the wood we examined here or on the north coast appeared water-worn. However, Armstrong (1857, p. 399) mentioned wood on the north coast with bark still adhering to it, a feature seldom seen on present day Banks Island driftwood.

²*Pinus* was also obtained from the north coast about 12 miles east of Bar Harbour, and pine and spruce are mentioned by Armstrong (1857, p. 397) near the Ballast Beach area.



Fig. 45. August 11, 1952. Looking out through the entrance of Bar Harbour. The foreground shows the gravelly surface typical of the coast between here and Cape Prince Alfred. A few inches below the surface the gravel is mixed with finer materials.

lignite.¹ Actually, two small parts of the Cape Kellett cliff, one at Duck Hawk Bluff and a smaller one a little farther west, may represent an older formation. The former contains no visible vegetable matter, and the bedded silt, of which it is entirely formed, is partly consolidated and in places sharply tilted. In one exposure just to the east of the main bluff, the strata are almost vertical, but this may have been caused by slumping. The more western exposure also shows a band of sand and pebble conglomerate, the yellow matrix material of which is jarosite, $\text{NaFe}(\text{SO}_4)_2(\text{OH})_6$ (Fortier, 1956). No fossil wood is known in the ridge east of Mary Sachs, and it is quite possible that the underlying deposit is similar to that at Duck Hawk Bluff. Near the eastern edge of the ridge, a few miles from Raddi Lake, we saw a fair amount of the soft, shaly mud and some angular pieces of the red-patinated rock, which suggests that the Lower Cretaceous goes at least that far west.

The Cape Kellett cliffs show an interesting erosion pattern of equal-sized triangular 'buttresses' separated by short, steep gullies. Similar erosion forms occur on some of the west coast cliffs and to some extent at Cape Cardwell, but they are nowhere as well developed as in the cliffs between Cape Kellett and Mary Sachs. The pattern, which is clearly visible in the air photographs,

¹Wilkins (1917, p. 66) reported seams of coal about 7 miles inland on the banks of a 'small river', probably that 6 miles east of Ballast Brook.

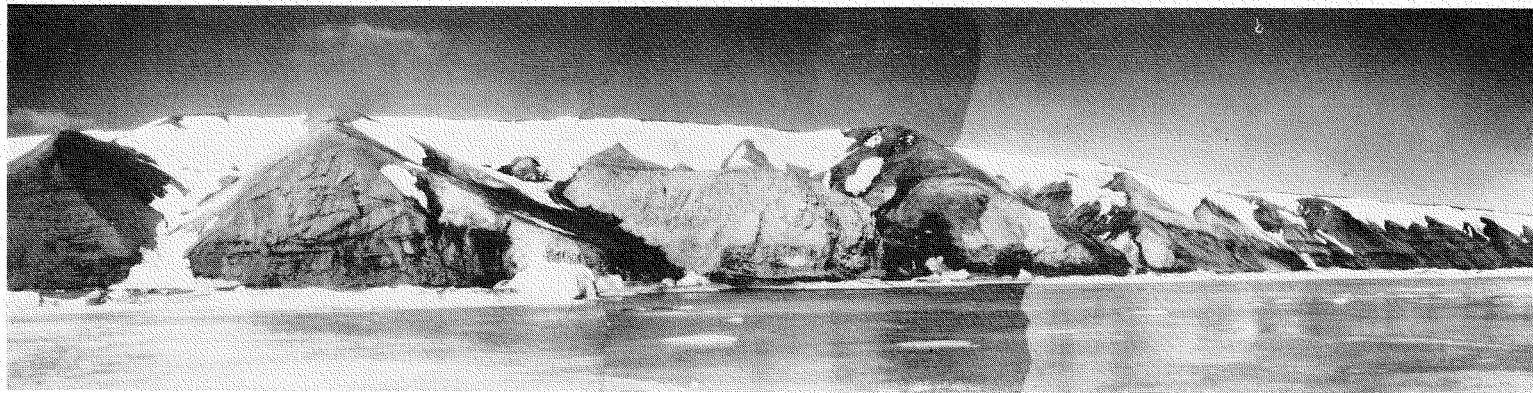


Fig. 46. May 23, 1953. Part of the Cape Kellett cliffs, with the 90-foot Duck Hawk Bluff near the centre of the picture. The exposure with the near-vertical strata (mentioned on p. 55) is the low, pale patch just to the left of the main bluff. To the left of this again the false bedding in the wood-bearing deposit is clearly shown. The triangular erosion pattern at the left of the picture continues for some distance westward.



Fig. 47. June 24, 1952. Cliffs, consisting chiefly of fine silt, 16 miles southeast of Sachs Harbour. The straightness of these cliffs, which were estimated to be about 60 feet high, may be an indication of rapid marine erosion. A distinct change in the shoreline, probably an increase in its steepness rather than in any actual rise of the land, must surely have taken place within the last 500 years, as there are Eskimo houses estimated to be of that age near the cliff top (See Fig. 14). The dark patches along the beach consist of mud recently washed out from the cliff and not yet carried away by a storm tide. Actually, unlike on the west coast, the fine material from the cliffs is not carried out to sea, but deposited just below tide level, and much of the ice shown in the picture is grounded on the mud bank.



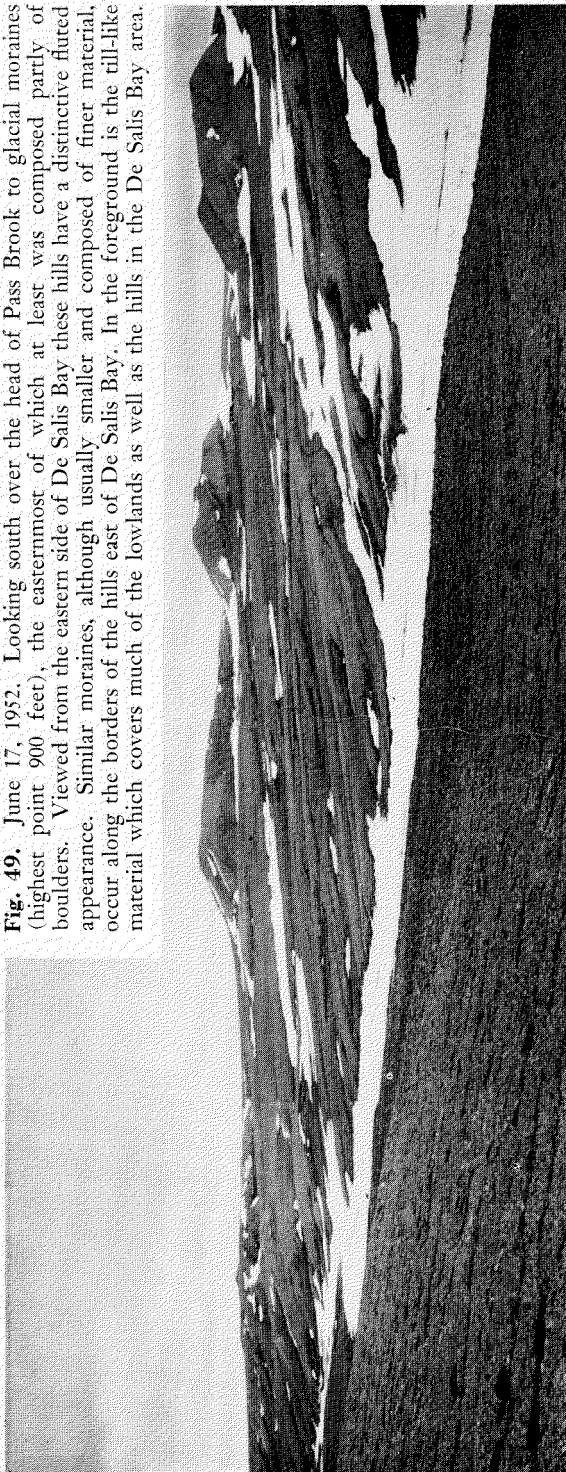
Fig. 48. June 20, 1952. Part of the moraine-like hills which lie along the coast for about 25 miles northwest of the valley of Masik River. In the foreground is a small peat deposit.

is doubtless formed by thaw water from the snow cornice which forms during the winter along the cliff top and which will be largest in any slight indentation of the cliff face. In order for the pattern to develop, there must be some marine erosion which prevents the buttresses becoming rounded, but it must not be too rapid; the cliff must be high enough for the snow to accumulate as a cornice along the top rather than as a bank at the bottom;¹ and within a short distance from the cliff top the drainage must be away from the cliff, and so prevent streams cutting the cliff.

Except for occasional gaps where lagoons lie behind pebble beaches, unconsolidated cliffs up to about 60 feet high border the southwest coast from Sachs Harbour to the valley of Masik River. Towards their western end these cliffs consist principally of silt; farther east, the silt appeared to be mixed with gravel, stones, and a few boulders, but these materials may be derived from the stony gravel hills, shown in Fig. 48, lying between this part of the cliff and the valley of Sachs River. The steepness of the central part of the cliffs and the comparative lack of gullies suggest that marine erosion may be very rapid. Lenses of fossil ice were seen near the western end of the cliffs, and the circular lakes lying to the southeast of Sachs Harbour (See air photograph A12769 12), as well as Sachs Harbour itself, which is a

¹Near Cape Kellett, where the cliff is lower and the snow bank forms at the bottom, the cliff is quite straight.

Fig. 49. June 17, 1952. Looking south over the head of Pass Brook to glacial moraines (highest point 900 feet), the easternmost of which at least was composed partly of boulders. Viewed from the eastern side of De Salis Bay these hills have a distinctive fluted appearance. Similar moraines, although usually smaller and composed of finer material, occur along the borders of the hills east of De Salis Bay. In the foreground is the till-like material which covers much of the lowlands as well as the hills in the De Salis Bay area.



roughly circular basin about 130 feet deep guarded by a wide bar under only 9 feet of water, may have been formed by the melting of ice lenses. It is probable that the deposit cut by the cliffs is younger than that which forms the ridge to the north of Sachs River, and possibly younger than that which forms the Cape Kellett cliffs.

Glaciation and Sea-level Changes

There can be no doubt that most of the extreme western part of Banks Island has been glaciated (cf. Jenness, 1952). There are obvious moraines on top and along the borders of the hills around De Salis Bay,¹ and large

¹The thick mantle of angular rock debris (See Porsild, 1955, pl. 2B) on Durham Heights led Porsild (1950, p. 52) to conjecture that it had not been covered by the main ice-sheet, although the esker that forms the summit indicated that there must have been a local ice cap. It is hard to see how this esker (or moraine, as it appeared to us in the distance) could have been raised above the plateau by a local ice cap, and Jenness (1952, p. 948), who also mentions the possibility of a local ice cap, found what he believed to be mainland erratics mixed with the local rock, and hence concluded that the plateau had been overridden by ice from the south.

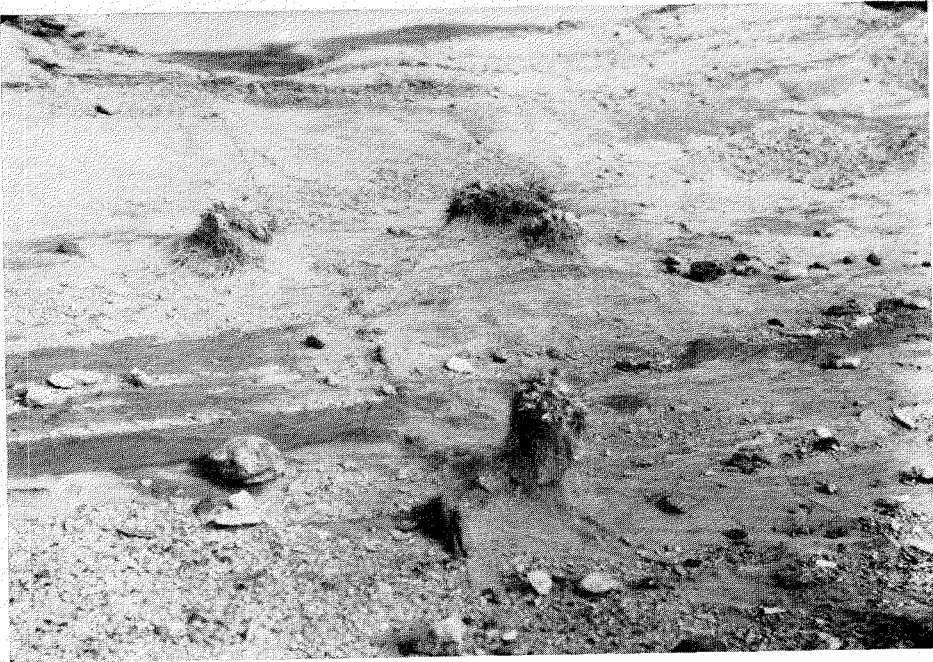


Fig. 50. The effect of wind erosion on a hilltop near Mahogany Point.

erratic boulders, chiefly of basalt, lie along the shore below the cliffs at Cape Collinson, Cape Cardwell, and northward past Alexander Milne Point. Between Alexander Milne Point and a little north of Princess Royal Islands the coast was not examined, but large boulders were common for some 30 miles north of the islands, although not beyond that. It is also probable that the many lakes among the hills bordering the east coast are formed by dams of glacial debris. At De Salis Bay both the hills and the lowlands are covered by a till-like deposit consisting of fine brown clay mixed with varying amounts of gravel and small stones. Where this is cut by the coastal cliffs, it can be seen to form a fairly uniform unstratified deposit seldom more than 20 feet thick and containing occasional large boulders. Presumably it is of glacial origin, but its present uniform distribution may be due to soil flow (cf. Washburn, 1947, p. 49). On the tops of hills and plateaux like those south of Masik River and east of De Salis Bay, the 'till' is frequently mixed with subangular stones up to about a foot across. These have evidently been concentrated on the surface by removal of the finer material. In spring whole hillsides are covered by trickles of water carrying fine sediment, and in dry weather exposed areas are subject to wind erosion. In western Banks Island both lakes and large boulders are scarce, and no obvious glacial moraines were seen near the coast. Nevertheless, till-like material similar to that at De Salis Bay is fairly common on the hills, including the ridge above the supposed interglacial deposit that forms the Cape Kellett cliffs. On the



Fig. 51. July 3, 1953. Remnants of a peat deposit on a bar between the sea and a salt water lagoon inside Sea Otter Island. Looking north towards Sea Otter Harbour.

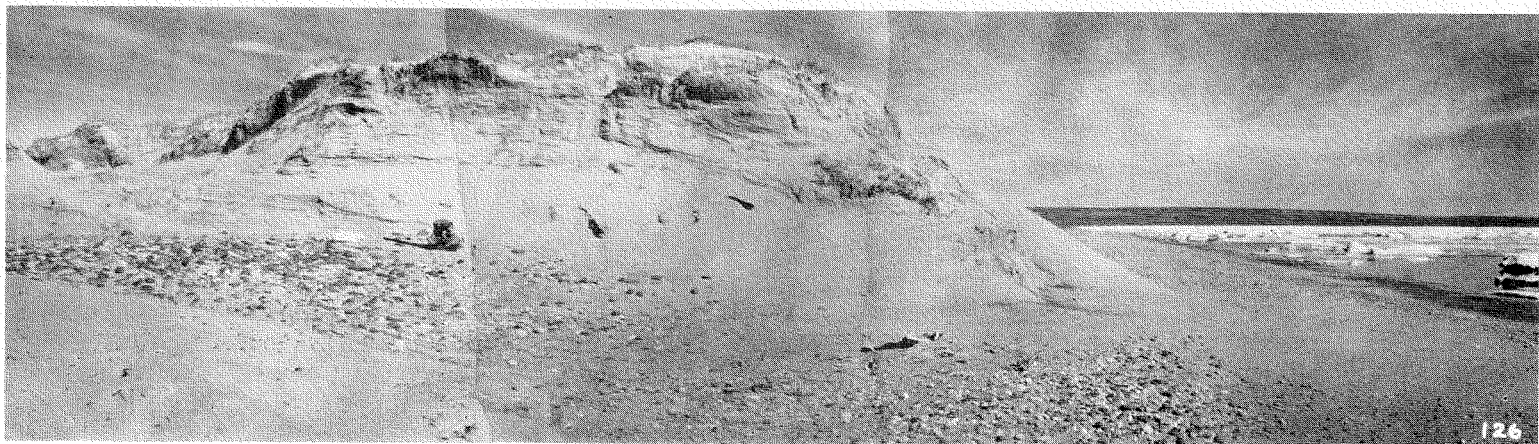


Fig. 52. July 9, 1952. Looking north along the beach on the west side of De Salis Bay and showing the 15-foot sandhill lying above the beach.

whole, however, it seems probable that the main ice cap never covered all of western Banks Island, at least in the last glacial period. Porsild (1950, pp. 52-3) considered that the northeast plateau area may also have escaped glaciation. It is possible that the westerly drainage of the larger rivers, which does not seem to be accounted for entirely by the higher land in the east, may have originated when the edge of the ice covered the eastern hills. Thaw water from this ice might also account for the wide, deep, river valleys. Even in the eastern part of the island (near De Salis Bay and Alexander Milne Point) peat deposits several feet thick were seen only about 100 feet above sea-level. I cannot recall peat of this type anywhere in the eastern Canadian Arctic, and, as Porsild (1955, p. 29) remarks, it suggests that considerable time has elapsed since de-glaciation.

On the northeast side of De Salis Bay an old shoreline, about 20 feet¹ above sea-level, is fairly easily traced, and it is clear that in the not very distant geological past a marine inlet covered Windrum Lagoon and the lower part of the valley of De Salis River. The flats below the cliffs along much of the north coast also indicate a slight rise in the land. Near Alexander Milne Point, a deposit about 30 feet above sea-level and near the top of the cliff, but not necessarily formed at the same time as the remainder of the deposit cut by the cliff, contained abundant shells identified by Wagner (1953) as *Hiatella arctica* (L.). Similar shells were seen on the surface at about this height near De Salis Bay. Above these heights no definite evidence of post-glacial submergence was observed by us, and solifluction and other erosive forces acting on the unconsolidated deposits, which form much of Banks Island, make it extremely difficult to recognize raised beaches and old marine cliffs. Porsild (1955, p. 198) found marine shells in an emerged strand line 600 feet above sea-level in northeast Banks Island, and Richardson (1956) collected *Saxicava arctica* several hundred feet above sea-level 3 and 4 miles inland from Russell Point. According to Jenness (1952, Fig. 2), northeast Banks Island is near the limit of continental glaciation, and conceivably Porsild's and Richardson's shells may therefore be of the same age as the fossil wood deposits of western Banks Island.² Certainly if, as seems probable, this wood was laid down under marine or estuarine conditions, there must then have been submergence up to at least 300 feet. Moreover (See Fig. 31), south of Masik River at 850 feet we found silt containing layers about an inch thick of small pieces of water-worn coal and wood, the latter apparently no older than the Cape Kellett wood (cf. Fortier, 1953).

At the present time, the west coast of Banks Island must be sinking, as the remains of peat deposits near the mouth of Kellett River lie under water at normal high tide. This was noted on the ground, but can also be recognized by the polygonal structure extending below water in the air photographs. Similar peat deposits inside Sea Otter Island were being washed and eroded by storm tides, although not actually under water at

¹There may have been a second raised shoreline at 45 feet.

²The same may be true of the specimens of *Littorina saxatilis* from the 580-foot level on the south side of Masik River (See p. 38).



Fig. 53. July 14, 1952. The cliffs near Alexander Milne Point, showing in the mid distance vegetation growing on the lower slopes, which are clearly not being eroded by the sea at the present time.

normal tides. Judging by the well-developed sand and gravel off-shore bars, the rate of sinking is not fast, and certainly along most of the west coast erosion is keeping pace with it, so that only in the extreme northern part, where the islands hold in the ice and prevent wave action, is there a typical drowned coast-line. In the De Salis Bay region, the evidence of recent sea-level change is conflicting. Near the mouth of Sandhill River, large, presumably wind-formed sand hills sit on top of the pebble beach and extend a little way below it on the seaward side. These sand hills appear to have been there for a great many years, during which time there can have been no tide as high as that which formed the beach. On the other hand, the Eskimo houses near Nelson River are built on an old pebble beach which is separated from the sea by a higher beach. This suggests that although the sea has retreated in a horizontal direction, there have been tides since the houses were built some 500 years ago that were higher than those which formed the beach they were built on.

In all parts of Banks Island driftwood occurs well above normal high tide level, but, unlike the driftwood in James Bay (Manning, 1951), none was seen at a height that could not be accounted for by exceptional storm tides. Possibly the older wood has been used by the Eskimos for fuel or has been covered by solifluction. On the south, as on the west, coast the mud

cliffs are being rapidly eroded by storm tides, but about Alexander Milne Point marine erosion is no longer active, and the lower parts of the cliffs have formed sloping, well-vegetated banks.

APPENDIX I

Fossils

From Jeletzky (1955), report No. KJ-I-55/56 on fossils collected on Banks Island and from field notes.

West side of bay between Cape M'Clure and Cape Crozier, 45 feet above sea-level, August 12, 1952.

G.S.C. Loc. Cat. No. 25152. Field No. 22.

Nucula sp. indet. resembling *N. athabascensis* McLearn

Tancredia? sp. indet.

Lucina? cf. *L.?* *goodrichensis* McLearn

One mile east of Antler Cove, 55 feet above sea-level, August 14-16, 1952.

G.S.C. Loc. Cat. No. 24393. Field No. 28.

Onestia? sp. indet.

Tancredia? sp. indet.

Lucina? sp. indet.

Corbicula? sp. indet.

G.S.C. Loc. Cat. No. 25150. Field No. 24.

Tellina? sp. indet.

Nucula? sp. indet.

Arctica? sp. indet. resembling *A. limpidiana* McLearn

Yoldia sp. indet.

Onestia? sp. indet.

Pecten (Entolium) sp. indet.

G.S.C. Loc. Cat. No. 25149. Field No. 26.

Tracia? sp. indet. resembling *T.?* *yardwoodi* McLearn

Tellina? sp. indet.

Lucina? sp. indet.

Pecten (Entolium?) sp. indet.

G.S.C. Loc. Cat. No. 25148. Field No. 25.

A fragment of an ? ammonite. If an ammonite, this fragment could resemble closely representatives of *Sommeratia s. lato* (including *Arcthoplites*, *Lemuroceras*, etc.).

Unfortunately the fragment is too poor to be positive about its ammonoid nature.

Onestia? sp. indet. resembling *O. onestae* McLearn

Lucina? sp. indet. resembling *L.?* *goodrichensis* McLearn

Nucula sp. indet.

Arctica? sp. indet.

G.S.C. Loc. Cat. No. 24392. Field No. 27.

Onestia aff. *O. onestae* McLearn

Lucina? sp. indet.

Nucula? sp. indet.

Yoldia? sp. indet.

Two miles east of Antler Cove, 20-80 feet above sea-level, August 16, 1952.

G.S.C. Loc. Cat. No. 25151. Field No. 32.

Tancredia? sp. indet. resembling *T.?* *pacia* McLearn

Lucina? sp. indet.

Mytilus? sp. indet.

Natica (Polinices?) sp. indet.

All fossils in Field No. 32 were from boulder-like 'concretions', often of an hour-glass shape, embedded in or fallen from a deposit of unconsolidated sand. Small projections on the 'boulders' indicated that they were not water-worn and had probably been formed in situ by percolating solutions.

All the above lots contain what appear to be the same pelecypod fauna. Although the preservation of the fossils is generally unsatisfactory and such diagnostic pelecypods as *Inoceramus*, *Aucellina*, *Aucella*, and *Trigonia* are lacking, it appears to be of a late Mesozoic, probably Cretaceous, age. There is nothing in it to support its allegedly Tertiary age (See G.S.C. geological maps). The fauna includes a peculiar Cardiidae genus *Onestia* McLearn. In North America this genus is so far only known from the Clearwater formation representing the zone of *Lemuroceras* and in terms of international standard stages of early to middle Albian age. It does not seem to ascend into the Upper Cretaceous and Tertiary strata. The representatives of *Onestia* from Banks Island are certainly very closely related to and may be conspecific with *Onestia onestae* McLearn from the Clearwater fauna. Also the representatives of several other pelecypod genera of the Banks Island fauna show affinities with the specific types of the same genera of the Clearwater fauna. Finally, the only ammonite? fragment of the Banks Island fauna appears to be similar to *Archoplites* or *Lemuroceras* of the Clearwater fauna. The above evidence taken together with the total absence of *Aucella* suggests tentatively a late Lower Cretaceous age correlative with the Clearwater fauna of the Canadian western interior region.

It should be stressed, however, that the stratigraphical range of the Clearwater pelecypod fauna is not yet worked out in detail. Therefore, that of Banks Island could conceivably correspond to the little known pelecypod fauna of the late Albian *Neogastrolites* fauna, or it could be older than the Clearwater fauna and be the marine equivalent of the Aptian-middle Neocomian non-marine faunas of the Canadian western interior region. The Banks Island fauna has little in common with the early Upper Cretaceous faunas (e.g., the Dunvegan) of the Canadian western interior region or Alaska, and it does not seem likely that it could be of an early Upper Cretaceous age; its distinctions from these Upper Cretaceous faunas could, however, be due to the difference in facies rather than in age, and the possibility that it is early Upper Cretaceous cannot, therefore, be ruled out in the present state of our knowledge.

APPENDIX II

Pollen Analysis

Report on samples from Banks Island, N.W.T., by J. Terasmae, 1955.

Sample No. 4. Banks Island—6 miles from Cape Kellett. [More precisely, 4 miles from the base of the Cape Kellett spit.] Thirty feet above sea-level.

Name of plant	No. of pollen grains found
<i>Picea</i>	28
<i>Pinus</i>	43
<i>Betula</i>	32
<i>Alnus</i>	abundant (local over-representation)
<i>Tsuga heterophylla</i> (?)	10
<i>Ulmus</i>	2
<i>Filix</i>	2
<i>Carya</i>	1
Non-arboreal pollen	17
Ericaceae	2
Spores of Polypodiaceae	1

Observed in this sample were also fungus remains, fragments of bark and of woody tissue, moss spores, and fragments of cuticle with preserved stomata of leaves of coniferous trees.

Sample No. 17. Banks Island—about 7 miles east of Cape Kellett. [More precisely, 5 miles from the base of the Cape Kellett spit.] Approximately 20 feet above sea-level.

Name of plant	No. of pollen grains found
<i>Picea</i>	6
<i>Pinus</i>	11
<i>Betula</i>	17
<i>Alnus</i>	16
<i>Tsuga heterophylla</i>	1
<i>Tsuga mertensiana</i>	1
<i>Carya</i>	3
<i>Ulmus</i>	1
<i>Salix</i>	1
Cf. <i>Fagus</i>	1
Non-arboreal pollen	32

Also found were *Sphagnum* spores, fungus remains, and fragments of cuticle with preserved stomata of leaves of coniferous trees. Among non-arboreal pollens were identified: Ericaceae, Caryophyllaceae, Cyperaceae, Gramineae, Polemoniaceae, and two pollen grains of *Ephedra* sp. Remains of brown-mosses were present.

The deposit appears to be interglacial and well worth further investigation. The assemblage seems to indicate much warmer climate at that time than at the present. Particularly interesting from the phytogeographical point of view are the discoveries of pollen grains of plants that have their northern distribution limits considerably south of Banks Island at the present time.

APPENDIX III

Manuscript Charts

Manuscript charts from M'Clure's and Collinson's voyages relating to Banks Island. Preserved in the archives of the Admiralty Hydrographic Department.

- D1010 Chart shewing the land discovered by H.M. Ship *Investigator* between September 1850 and October 1851. Robert M'Clure, Commander. [Drawn by] Stephen Court, Second Master.
- L9304¹ Chart shewing the land discovered by H.M. Ship *Investigator* between September 1850 and April 1852. Robert M'Clure, Commander. [Drawn by] Stephen Court, Second Master.
- D1071 Chart shewing the track of H.M.S. *Investigator* along the North Coast of America between the 2nd. of August 1850 and the [unfinished title] In a series of [7] sheets [of which 4-6 show parts and sheet 7 all of Banks Island]. [Drawn by] Stephen Court, Second Master.
- D1073 Harbour of Mercy. Surveyed by Mr. Stephen Court—Second Master H.M. Ship *Investigator*. Commanded by Robert M'Clure, Esqr., Commander, 1853.

¹This chart is annotated "Received from Capt. Hamilton [word unreadable] 17th: Oct. 5 P M 1853 ABB". Presumably it is the same chart which [Hinks] (1924, p. 521) says is 'endorsed by Captain A. B. Belcher, R.N., Assistant Hydrographer, "Recd. in the Hydrographic Office on the 13th of October 1853."' [Hinks] (1924, pp. 520-521) appears to consider D1010 and L9304 as copies of a single chart, and mentions two others preserved at the Admiralty: one copy made by Court himself, and one later by W. B. Shellabear, Second Master of H.M.S. *North Star*. [Hinks] also mentions rough copies of three sheets of D1071. However, a letter from Commodore K. St. B. Collins, Hydrographer, Admiralty, indicates that all charts are included in the present list.

- D1072 [Part of Prince of Wales Str. with Princess Royal Is. and the *Investigator's* winter quarters 1850-51.]
- L9311¹ Chart showing the North West Passage discovered by H.M. Ship *Investigator* . . . [Signed] Approved by E. A. Inglefield. Drawn by W. H. Fawckner 2nd Master.
- D1075 Chart shewing the track of H.M.S. *Enterprise* during the months of August and September 1851, 1852, & 1853 and the route of the travelling parties in April, May & June 1852 and May 1853. [Signed] Rd. Collinson Captain.
- D1405 Chart shewing the track of H.M. Ship *Enterprise* in August and September 1851 and the route of the travelling parties in April, May and June 1852. [Signed] R.C.
- D1404 Chart shewing the track of H.M. Ship *Enterprise* in August and September 1852 & 53 and the route of the travelling parties in April and May 1853. [Signed] R.C.
- D1067 Spherical chart of a portion of the Polar Sea between the meridians of Point Barrow and Barrow Strait shewing the search of the *Enterprise* for the *Erebus* and *Terror*.
- D7571 Track of Sledge "Resolution" from 5th May to the 29th June 1852. Murray T. Parkes Actg. Lieut.
- L9899 Track of H.M. Sledge "Discovery" between April 3rd and June 12th, 1854. Rec. H O 30 Sept 54 G. F. Mecham Lieut.

APPENDIX IV

Geographical Names

The following new or previously unpublished names have been adopted by the Canadian Board on Geographical Names since the publication of my former list (Manning, 1953, p. 196). Most have already been used on the 8-mile National Topographic Sheets of Banks Island published in 1954 and 1955.

Adam River. Local name. Adam was one of the first mainland Eskimos to winter on Banks Island, and probably camped near the river mouth.

Atitok River. The Banks Island Eskimos were understood to call this 'No Name' River in the English. The Department of Northern Affairs and National Resources recommend a translation into Eskimo.

Ballast Brook. New name. Ballast Beach, where ballast for the *Investigator* was gathered and abandoned, was either to the east or to the west of this brook.

Bar Harbour. New name. A bar across this harbour prevents large pieces of ice from entering.

Bernard River. Local name. It enters the sea near Bernard Island. Inadvertently used in Fig. 2, Manning, 1953, without C.B.G.N. approval. Called 'Wilkins River' in Desbarats (1916, p. 72), and 'Harkin River' in McDiarmid (1923, p. 298).

Blue Fox Harbour. Local name. After an Eskimo schooner, the *Blue Fox*, which probably wintered there.

Cancolim Harbour. New name. Soundings were taken there by C.G.M.V. *Cancolim II* on August 26, 1951.

Cardwell Brook. New name. Its mouth is near Cape Cardwell.

Duck Hawk Bluff. New name. Duck hawks nest there.

Gyr Falcon Bluff. New name. Called 'The Bluff' by the crew of the *Investigator* (Armstrong, 1857, p. 474). Gyrfalcons were seen there in 1949 (Porsild, 1950, p. 54) and in 1953.

¹This chart is evidently the original of Inglefield (1853).

Investigator Point. New name. The *Investigator* passed this point on September 23, 1851, and was abandoned in Mercy Bay in 1853 (M'Clure, 1854).

Jesse Harbour. New name. The inner part of Jesse Bay.

Johnson Point. New name. Old maps and charts, including some of the *Investigator* MS. track charts (not the large scale D1072), show a bay called 'Johnson Bay' near this point. It is not mentioned in any literature examined, and the air photographs show that no pronounced bay exists near there. As it is not possible at present to say whether the name should refer to the indentation to the north or that to the south of the point, the name has been transferred to the point. Inglefield (1853) marks Johnson Point, but puts it in a bay, so it is probably a misprint.

Lennie Harbour. Local name. Sam Lennie was one of the first mainland Eskimos to winter on Banks Island.

Lennie River. As above.

Mahogany Point. New name. About half the driftwood on this point was mahogany from the *Investigator*.

Mills Creek. From MS. Chart D1071, Sheet 7. The exact position of the feature there referred to cannot be determined, but it is clearly in De Salis Bay, where there is only one obvious creek. Not mentioned in any literature examined.

Moose Island. Local name. Something happened to a dog of that name on the island. Probably he was shot.

Muskox River. New name. Over 100 muskox skulls are scattered over a hill just north of the junction of this river with Thomsen River. Also, the first live muskox to be observed on Banks Island since the early part of the century was seen near the river in 1952.

North Star Harbour. The schooner, *North Star*, now owned by Fred Carpenter, wintered there some years ago.

Parker River. New name. It reaches the sea at Parker Point.

Pass Brook. New name. It flows east from Masik Pass.

Passage Point. New name. It was from the hills behind this point that M'Clure saw Melville Sound and established his claim to the discovery of the Northwest Passage.

Pim Ravine. New name. Lieut. B. T. C. Pim reached Banks Island near or a little east of this ravine on April 3, 1853 (Pim, 1855, p. 655).

Rufus River. Local name. Rufus was a Banks Island Eskimo. He probably had a trap-line along the river.

Sandhill River. New name. There are wind-formed sand hills near its mouth.

Sea Otter Island. Local name. After an Eskimo schooner which is believed to have sheltered there from the ice.

Sea Otter Harbour. Local name. It is believed that the above schooner wintered there.

Shelter Island. New name. Shelter from ice and weather may be obtained behind this island.

Siksik Point. Local name. Origin unknown. Ground squirrels (Eskimo, Siksik) are not known on Banks Island.

Storkerson River. Local name. This river flows into Storkerson Bay.

Wilkins Bay. New name. For Sir Hubert Wilkins. Bernard River, once called 'Wilkins River', flows into this bay.

Windrum Lagoon. Named 'Windrum Anchorage' by Donnelly (1943b) for W. Windrum, Superintendent of Yellowknife Division of Canadian Pacific Airlines, who landed there in 1943 in company with Donnelly.

APPENDIX V

Monuments and Records

Beacons, caches (other than Eskimo meat caches), records, recent Eskimo houses and tent frames known to have been built on Bank Island. Listed counter-clockwise from Nelson Head.

Nelson Head. Pole with large painted ball and cask containing record left September, 1850, in $71^{\circ}06'N.$, $123^{\circ}00'W.$ (M'Clure, 1854, p. 34). Probably on the low hills just north of the cliffs or on the beach still farther north (See MS. Chart D1071 No. IV; Armstrong, 1857, pp. 208-12).

Cape Collinson. Remains of turf house with tin cans and box wood scattered about it at extreme north end of cliff. Now falling into the sea. Possibly built by Masik and Binder (Masik and Hutchison, 1935, pp. 107-8). Seen July 1952.

Windrum Lagoon. Geodetic Survey's beacon on north side of lagoon, latitude $71^{\circ}29'08''.6$, longitude $121^{\circ}42'29''.8$. Established August 1943 (Donnelly, 1943b). Seen July 1952.

In July 1952 there were two kegs of gasoline about 1 mile east of the beacon and three kegs on the spit about 1 mile from the mouth of Sandhill River (See Manning, 1953, pp. 181-2). On the same spit near the southwest end of Mills Creek are the turf walls of Eskimo houses, some 15 years old. Seen July 1952.

Pass Brook. Cache or grave goods on hill shoulder south of and 3 miles up Pass Brook. Seen June 1952 (See Manning, 1953, p. 176).

De Salis Bay. Record left by G. Arbuthnot of H.M.S. *Enterprise*, August 1852, probably near the southeast spit (Collinson, 1889, p. 229; MS. Chart D1075). Turf walls remaining from Eskimo houses, probably about 15 years old, on southeast spit. Seen June 1952.

Schuyter Point. Tall, conspicuous beacon on cliff top in this vicinity marks the best place to obtain coal (See p. 41) (Eskimo report).

Jesse Harbour. One or more Eskimo wooden tent frames, probably some 10 years old (Eskimo report).

Passage Point-Russell Point Area. Cairn built and record left by M'Clure (1854, pp. 37-8) in October 1850, at latitude $73^{\circ}31'N.$ about 15 feet above the water in a spot "so conspicuous, that any person passing along the shore must remark it". Position marked on MS. Chart L9304. Krabbé (1855b, p. 712) sought in vain for M'Clure's beacon at the end of April 1854, and remarks

that he later learned that Collinson had removed the record and probably destroyed the beacon. However, there is no indication in Collinson (1855a,b, 1889; MS. Charts D7571, D1075) that anyone from the *Enterprise* visited the northeast point of Banks Island. In the following month Meham (1855b, p. 700) also looked unsuccessfully for the M'Clure cairn, and built one of his own about 2 miles from Russell Point. In April 1909, Morin (1910a, pp. 133-5) searched without success for M'Clure's beacon. He too left a record in a bottle covered with stones near a high rock 5 miles west of Russell Point. In July 1917, Stefansson (1921a, pp. 637-8) found a brass cylinder with a record signed by M'Clure. It was dated April 21, 1851, and therefore evidently left by Lieut. Cresswell rather than by M'Clure, who had been there the previous autumn. This record was near a few small stones, presumably the remnants of M'Clure's beacon, on a gravel bank 20 to 30 feet high half a mile inland on the north side of a small creek which has its mouth 3 miles south of Knight Harbour. This must be the brook that discharges at Passage Point. Stefansson left a record in a new, but probably not very permanent, beacon on the same site. About 2 miles south of Knight Harbour Stefansson left his two sledges and some other equipment. One of the sledges was picked up by H.M.C.S. *Labrador* and is now in the Public Archives of Canada.

Rodd Head. A cairn, 1½ feet high, covering a bronze Geodetic Survey of Canada tablet cemented into a 2½-foot piece of lead pipe, with 3 inches of pipe above ground, which is situated on an outwash fan about 100 feet from shore, marks the astronomic position, latitude 74°13'52", longitude 117°22'56" (Forrester, 1954a).

Cape Hamilton. A record was left in the vicinity of Cape Vesey Hamilton by Lieut. Cresswell in May 1851, but the cairn could not be found by Stephen Court (Armstrong, 1857, p. 472) or by Krabbé (1855b, p. 713). The latter (p. 716) himself left a cairn and record (See p. 10) for later visitors. Green (1910, p. 153) was probably in error in thinking that a whaleboat and stores had been left at Cape Vesey Hamilton.

Back Point. See p. 11.

Providence Point. Before the *Investigator* was abandoned on June 3, 1853, 4 months' supplies for 66 men were placed on shore about three-quarters of a mile south of Providence Point (listed by M'Clure, 1855a, p. 108; Osborn, 1856, p. 288). Additional supplies were landed by Krabbé (1855b, p. 715; See Belcher 1855, pp. 99-101 for complete list). The cache was raided by Eskimos (See p. 34), and when next visited by Europeans in June 1909, nothing remained except about 6 tons of coal, pieces of sail, rope, and debris of packing materials (Morin, 1910b, pp. 176-7). It was visited by Stefansson (1921a, p. 362) in July 1915 and by Manning (1953, p. 190) and Macpherson in August 1952, and again seen in August 1953 (See p. 8).

MS. Chart D1073 gives the latitude of Providence Point, on which a cairn is marked, as 74°07'N. This, then, is the cairn mentioned by Osborn (1856, p. 241), latitude 74°06'48", where a record was left in a cylinder attached to a pole in the expectation of the release of the *Investigator* in August 1852.

It was probably the same cairn, erected on a 'neighbouring hill', in which a record was deposited in May 1853 (Armstrong, 1857, p. 575). It is certainly that which Krabbé (1855b, p. 715) found in good order with the 'cylinders duly secured to the staff' and from which the *Investigator* bore S.12°E. 1,400 yards. Presumably it is the one at which he (p. 716) also left records in a tin cylinder and guttapercha bag in May 1854, and probably the one erected (rebuilt?) in May 1853. It may have been this cairn, which Morin (1910b, p. 177) says he rebuilt in June 1910, and at which he left a record wrapped in a flag. However, no record or evidence of rebuilding was seen by us, and it is on a low hill rather than on a beach (See Manning, 1953, Fig. 16).

Three members of the crew of the *Investigator* were buried on the beach 400 yards from the ship (Armstrong, 1857, pp. 560, 575), and a tablet was erected to their memory (Osborn, 1856, p. 228), but neither the graves nor the tablet have been seen (See p. 9) since the Eskimos found the *Investigator*, and presumably they have been destroyed or washed away.

Investigator Point. A bronze Geodetic Survey of Canada tablet cemented into a 2½-foot piece of lead pipe buried 1 foot in the ground and situated about 12 feet from high water on the rounded point immediately south of the spit at Investigator Point marks the astronomic position, latitude 74°12'17", longitude 119°04'56" (Forrester, 1954b).

Mahogany Point. In August 1952 a record was left in a small but conspicuous beacon on the limestone-capped hill (See Fig. 39). A Geodetic Survey tablet in a boulder 120 yards south of extremity of point and 5 yards east of west side marks astronomic position, latitude 74°13'49", longitude 119°26'36", taken July 1953 (Sparrow, 1953).

Castel Bay. In July 1953, a rusted steel drum, presumably the 50-gallon kerosene drum left by Stefansson (1921a, p. 650), was seen towards the head of the east side of the bay.

Antler Cove. In August 1952 Macpherson and I left a record in a beacon constructed of rocks, a 10-gallon gasoline keg, and caribou antlers on the western slope of the hill above the eastern part of the bay.

Ballast Brook. Fifty-five tons of stones for ballast were collected and left on Ballast Beach (M'Clure, 1854, p. 46; Armstrong, 1857, p. 425), which is thought to be near Ballast Brook. By now they may be covered by earth movement or carried away by ice. Wilkins (1917, p. 66) found a beacon near the coast on the southwest branch of a brook which is probably Ballast Brook. This beacon was probably built by the crew of the *Investigator*.

Cora Harbour. Wooden tent frame and wreck of *Cora* (See Manning, 1953, pp. 185-6).

Norway Island. Stefansson (1921a, p. 235) left a record in a conspicuous beacon on the highest hill on Norway Island.

Bernard Island. Stefansson (1921a, p. 237) left a record in a beacon.

Adam River. Wood tent frame on the north side of the bay into which this river discharges. Seen July 1953.

Cancolim Harbour. Wood tent frame at the head of the northwest inner harbour. Seen August 1951.

Terror Island. In September 1851, Collinson (1889, p. 158) left a record and 20 days' provision for eight men. No sign of either in August 1952 (See Manning, 1953, p. 184).

Sea Otter Harbour. Eskimo hut (See Fig. 23), and, on hill behind, about five recent Eskimo graves. Seen July 1953. A mile or so west of hut is a wood tent frame, and 2 miles northwest, several steel drums. Seen August 1952.

Lennie Harbour. Frame tent seen August 1952 was used by the Eskimos during the winter of 1952-53.

Blue Fox Harbour. A hut, belonging to Eskimos, in good repair and made from galvanized corrugated iron sheets, on north side of harbour. Seen August 1952.

Cape Kellett. A cask and notice left by M'Clure on the spit in August 1851 was found the following month by Collinson (1855a, p. 945; 1889, p. 157).

Remains of a tar paper shack, left by the U.S.S. *Burton Island* in 1952, are near the Thule houses. Nearby, a 2-inch pipe, 2 feet of which protrudes above ground, marks the astronomic position, latitude $71^{\circ}57'29''$, longitude $125^{\circ}49'25''$ (Forrester, 1954c).

'*Mary Sachs*'. The turf walls of the Canadian Arctic Expedition's houses (See p. 19) are plainly visible. Seen June 1953.

Sachs Harbour. The Eskimo settlement, as in June 1952, is shown in photograph on p. 178 of Manning 1953. See also p. 36 above.

In the autumn of 1953, an R.C.M.P. post was added, and in 1954, a weather station on the hill behind the settlement.

Masik River. It is said that there are remains of recent Eskimo turf huts, presumably similar to those at De Salis Bay, near the river mouth.

Midway between Rufus River and Cape Lambton. In September 1851, the *Enterprise* being near shore, G. A. Phayre was sent to fetch water and leave information (Collinson, 1889, p. 159). Judging by MS. Chart D1075, this must have been about midway between Rufus River and Cape Lambton.

Cape Lambton. Lieut. Cresswell deposited a record at a cairn built on a low beach near Cape Lambton (M'Clure, 1854, p. 41). MS. Chart D1071, Sheet 4, indicates that it may have been on the beach which actually forms Cape Lambton or on that about 2 miles east.

Other Official Names

*Alexander Milne Pt.	Inglefield, 1853		*Rear-Adm. Sir Alexander Milne
*Back Pt.	Chart 1854	Armstrong, 1857, p. 462	*Adm. Sir George Back
*Ballast Beach	Inglefield, 1853	M'Clure, 1854, p. 46; *Armstrong, 1857, p. 425	Ballast for <i>Investigator</i> collected and abandoned
Bernard I.	Stefansson, 1921a, Chart opp. p. 594	*Stefansson, 1921a, p. 227	Peter Bernard, Can. Arc. Expdn.
*Burnett B.	Inglefield, 1853	Armstrong, 1857, p. 385	*Sir William Burnett
Cardwell, C.	Collinson and Rae, 1855		*Viscount Cardwell
Castel B.	Stefansson, 1921a, Chart opp. p. 594	*Stefansson, 1921a, p. 476	Aarnout Castel, Can. Arc. Expdn.
Collins, C.	Chart 1854		
Collinson, C.	Collinson and Rae, 1855		*Capt., later Adm., Sir Richard Collinson
Colquhoun Pt.	Armstrong, 1857, Chart	M'Clure, 1854, p. 46; Armstrong, 1857, p. 428	*Col. Colquhoun, R.A.
*Crozier, C.	Inglefield, 1853	M'Clure, 1854, p. 48; *Armstrong, 1857, p. 448	*Capt. F. R. M. Crozier, R.N.
*Durham Hts.	Inglefield, 1853	Armstrong, 1857, p. 380	*John George Lambton, 1st Earl of Durham
De Salis B.	Collinson and Rae, 1855		
*Gore Is.	Inglefield, 1853	*Armstrong, 1857, p. 388	*Lieut. Graham Gore, R.N.
*Haswell Pt.	Chart 1854		*Lieut. W. H. Haswell of H.M.S. <i>Investigator</i>
Jesse B.	Chart 1854		
*Kellett, C.	Inglefield, 1853 ¹	M'Clure, 1854, p. 441; Armstrong, 1857, p. 381 ¹	*Capt., later Vice-Adm., Sir Henry Kellett, R.N.
Knight Har.	Stefansson, 1921a, Chart opp. p. 594	*Stefansson, 1921a, pp. 399, 636	E. Lorne Knight, Can. Arc. Expdn.
		*Montgomery, 1932, p. 213	
*Lambton, C.	Inglefield, 1853	M'Clure, 1854, p. 41 ²	*1st or 2nd Earl of Durham
*Liot Pt.	Inglefield, 1853		
Masik Pass ³	Stefansson, 1921a, Chart opp. p. 594	*Masik and Hutchison, 1935, p. 109	August Masik, Can. Arc. Expdn.
M'Clure, ⁴ C.	Chart 1854 ⁵	*Armstrong, 1857, p. 446	*Comdr., later Vice-Adm., Sir Robt. M'Clure
*Meek Pt.	Inglefield, 1853	Armstrong, 1857, p. 384; Collinson, 1855b, p. 199	
*Mercy B.	Chart 1854 ⁶	*M'Clure, 1854, p. 496; *Armstrong, 1857, p. 465	In remembrance of many perils escaped
*Nelson Head ⁷	Inglefield, 1853 ⁸	*M'Clure, 1854, p. 348; *Armstrong, 1857, p. 211	*Lord Nelson
*Norway I.	Inglefield, 1853	Armstrong, 1857, p. 386	*Probably Lieut. Neville Norway, R.N.
*Parker Pt.	Inglefield, 1853		*Probably Vice-Adm. Sir Hyde Parker or Adm. Sir William Parker, or possibly J. Parker, M.P.
Pennell Pt.	Chart 1854		*C. H. Pennell, sen. clerk, Admiralty
*Prince Alfred C.	Inglefield, 1853	*M'Clure, 1854, p. 44; *Armstrong, 1857, p. 388	H.R.H., presumably Prince of Wales
*Providence Pt.	Inglefield, 1853 ⁹	Armstrong, 1857, p. 459	Providential escape of <i>Investigator</i>
*Robilliard I.	Inglefield, 1853	Armstrong, 1857, p. 386	*Probably Lieut. John Robilliard, R.N.
Rodd Head	Chart 1854		
*Russell Pt. ¹⁰	Inglefield, 1853	*Armstrong, 1857, p. 281	*Lord John, later 1st Earl, Russell
Sachs Har. ¹¹	Stefansson, 1921a, Chart opp. p. 594		The <i>Mary Sachs</i>
*Schuyter Pt.	Inglefield, 1853 ¹²		
*Stewart Pt.	Inglefield, 1853		*Probably Rear-Adm. Houston Stewart
Storkerson B.	Stefansson, 1921a, Chart opp. p. 594	*Stefansson, 1921a, p. 263	Storker T. Storkerson, Can. Arc. Expdn.
*Terror I.	Admiralty Chart 2443	*Collinson, 1889, p. 158	H.M.S. <i>Terror</i>
Thesiger B.	Collinson and Rae, 1855		*Rt. Hon. Sir Frederick Thesiger
Thomsen R.			Charles (Carl) Thomsen, Can. Arc. Expdn.
*Vesey Hamilton, C.	Inglefield, 1853		*Lieut., later Adm., Sir Richard Vesey Hamilton
*Wallace Pt.	Inglefield, 1853		
Wolley Pt.	Chart 1854		*Henry and Thomas Wolley, sen. clerks, Admiralty
*Worth Pt.	Inglefield, 1853		
Wrottesley, C.	Chart 1854	*Armstrong, 1857, p. 444	*Baron Wrottesley

The above table gives all names at present officially approved except those listed above as new and those listed by Manning (1953). Names starred appear on at least one of the MS. charts listed in Appendix III. The second column gives the earliest published chart or map seen bearing the name in question. The third column gives one or more references indicating where the name was given. If the reference also gives the origin of the name it is starred. The fourth column shows the person or vessel for whom the name was given. When this information has been obtained, or partly obtained, from White (1910), the name of the person or vessel is starred. It appears that in many cases the origin of the names given by White are probabilities based on the contemporary published origin of the same name given for other northern features.

¹ Here called 'Kellett Point'.

² Later referred to by M'Clure (1854, p. 44) and by Osborn (1856, p. 202) as Cape Hamilton, probably because of a slip in M'Clure's notes.

³ The exact position of the original Masik Pass as named by Stefansson (Masik and Hutchison, 1935, p. 109) has not been determined. As used by Manning (1953, p. 177) and in this paper, it is at the head of Pass Brook. The charts accompanying Stefansson (1921a) indicate that it may be farther north, but there is no general information for the country in that direction.

⁴ Originally called Cape Austin (Inglefield, 1853; M'Clure, 1854, p. 48; Armstrong, 1857, p. 446).

⁵ 'Maclure'.

⁶ 'Bay of Mercy'. On MS. Chart D1073, 'Harbour of Mercy'.

⁷ Called Cape Erebus by Collinson (1889, p. 152).

⁸ 'Lord Nelson's Head'.

⁹ Misplaced on this chart. It seems that when the *Investigator* ran aground on the mud bank off Providence Point no one realized how far they had turned into Mercy Bay. As a result, only the large scale MS. chart of Mercy Bay, D1073, presumably drawn later, places Providence Point accurately. The first published chart (1854) to show Providence Point clearly places it, the shoal off it, and the *Investigator's* anchorage, at the northwest point of Mercy Bay and actually north of Back Point, although M'Clure (1854, p. 49) says that the eastern point of Mercy Bay bore northeast 8 miles from the shoal. This error on Chart 1854 was followed

by later charts and by the *Arctic Pilot* (1931, p. 207). It misled Green (1910, p. 154) and Morin (1910b, p. 176) in their search for M'Clure's cairn, and caused Stefansson (1921a, p. 361) to remark that the conspicuous sand spit ('mud bank', M'Clure, 1854, p. 49) off Providence Point no longer existed.

¹⁰ The Russell Point region is poorly delineated on both the *Investigator* MS. charts and on later published charts. The MS. charts are also distinctly variable. Chart 1854 and subsequent charts appear to agree with the track chart accompanying Meham (1855b), and were probably derived from his observations. This means that the position of the actual point that should be called Russell is in doubt. The decision to place it as on the present map is based primarily on MS. Chart L9304, which clearly shows M'Clure's beacon well to the south of Russell Point and, therefore, close to the point now called Passage. It appears also that Storkerson and Stefansson (1921a, p. 636; Montgomery, 1932, p. 212) placed Russell Point close to Knight Harbour, and when we came along the coast from the northwest it was there that ice conditions altered and we considered that we had entered Prince of Wales Strait.

¹¹ On the charts accompanying Stefansson (1921a) this name may have been meant to apply to the place now locally known as 'Mary Sachs' where the vessel of that name was put ashore. There is, however, no harbour there. The present Sachs Harbour was called 'Baur Harbour' by Stefansson (1921a, p. 656), doubtless for W. J. Baur, a member of the expedition.

¹² Spelled 'Schuyler' here and on MS. charts. 'Schuyter' first appears on Collinson and Rae (1855).

It has not been possible at present to locate accurately the features referred to by the following names. All except Johnson Bay are on the north coast. The references in brackets indicate the early charts on which the names appear and the description, if any.

Mount Bernier (Morin, 1910b, p. 171).

Cape Clifton (Chart 1854).

Cape Giffard (Chart 1854).

Cape Giffard (Admiralty Chart No. 2443).

Johnson Bay (MS. Charts D1071, Sheet 6; D1010; L9304; Inglefield, 1853; Chart 1854).

Midland Point (Chart 1854).

Cape Sandom (MS. Charts D1071, Sheets 6, 7; D1010; L9304; Inglefield, 1853; Chart 1854).

Vanasse Ravine. This is presumably in the vicinity of Rodd Head. Morin (1910b, p. 172) says it may be distinguished from seaward by a large stone.

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