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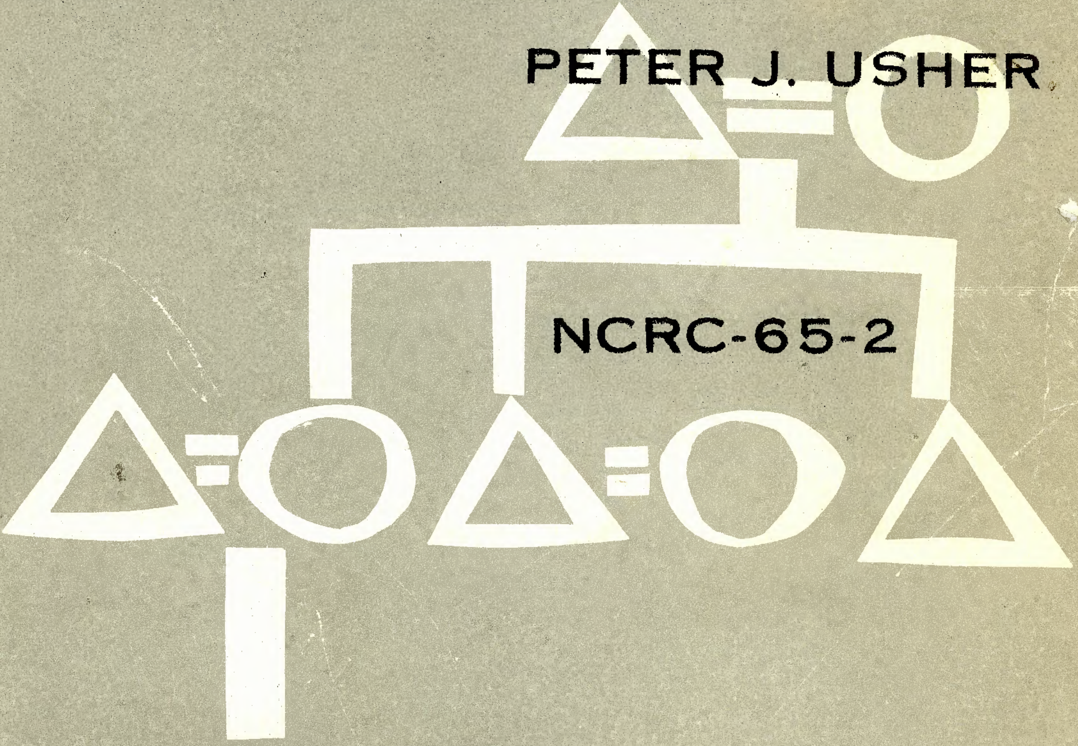
ECONOMIC BASIS AND RESOURCE USE OF THE COPPERMINE - HOLMAN REGION, N.W.T.

PETER J. USHER



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ECONOMIC BASIS AND RESOURCE USE OF THE COPPERMINE - HOLMAN REGION, N.W.T.

by

Peter J. Usher

This report was originally submitted as a thesis at McGill University, and is being reproduced in its present form as a contribution to our knowledge of the North. The opinions expressed, however, are those of the author and not necessarily those of the Department.

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TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

LIST OF MAPS

LIST OF FIGURES

LIST OF PLATES

LIST OF TABLES

LIST OF TABLES (cont.)

LIST OF APPENDICES

INTRODUCTION

Location of the Coppermine - Holman Region

This study concerns the two Eskimo communities of Coppermine (67°49'N, 115°05'W) and Holman (70°44'N, 117° 45'W), and their hinterlands. Coppermine is situated on the Arctic Coast of the Mackenzie District of the Northwest Territories; almost 1000 miles north of Edmonton, Alberta. Holman lies on the western side of Victoria Island, in the District of Franklin, Northwest Territories; almost 200 miles north of Coppermine. While the hinterlands of the communities may be defined in several different ways, as will be seen in the text, the area outlined in Map 1 includes virtually all places relevant to this study. This area extends from 67°N to 73°N, and from 109°W to 122°W, and will hereafter be referred to as the Coppermine - Holman region. Important place names will be found in Map 2.

The boundaries of the Coppermine - Holman region coincide closely with those of the Coppermine Administrative Area, one of the administrative units of the Northwest Territories. The region is also very similar to the W2 Health and Registration District, except that the latter

MAP I

LOCATION OF

COPPERMINE - HOLMAN REGION

includes the Contwoyto Lake area. Thanks to the similarity of these regions, much statistical data directly relevant to this study were already available. The Coppermine - Holman region is, as might be expected from the name, bi-nodal, although Coppermine is by far the more important of the two settlements. The region is the western half of an area traditionally inhabited by the Copper Eskimos, and indeed these people form the great majority of its inhabitants today.

Nature and Scope of the Study

At the outbreak of World War One, in 1914, the Copper Eskimos were still living in the Stone Age. For several centuries, these people, numbering only a few hundred, had been able to overcome every challenge which their environment placed before them. Unsupported by anything but their own labours and ingenuity, they existed from generation to generation. Each could expect but a brief existence -- three score and ten years were never the Eskimos' allotment, for periodic famines weeded out all but the healthy and able-bodied, and even these could fall prey to natural calamities or accidents.

Few white men had seen this hardy people, or the land they lived in. The advance of western civilization was inevitable, however, and by 1920, traders and missionaries had thronged to the area in search of furs and converts. This invasion and occupation of the region by the white man has continued to the present day.

During the past half-century, the Eskimos have had to face tremendous readjustments. Their strictly hunting economy changed to a trapping economy and is now changing to a wage economy. The arrival of the white man has altered the Eskimos' technology, resource base, hunting and trapping patterns, and seasonal life. It has altered where the Eskimos live and also the nature of their homes and communities; indeed it has changed the entire nature of their occupance and utilization of their environment. A knowledge of these changes, and of the physical environment in which they occurred, is vital to the understanding of the present economy and resource base, and these factors are discussed in the first two chapters. Chapters III, IV and V concern the population, the settlements, and transportation, as the nature of these has important consequences for the region's economic situation. This study is primarily, however, an inquiry into the present resource base and economic life of the Coppermine - Holman region, and it is to these aspects of the region that the greatest attention is given. Present income from all sources, including country produce, is analysed and compared with the economic potential of the region and with the needs of the people. The study attempts to isolate and analyse the important problems and trends in the economic life of the area, and to outline some possible solutions to them.

The members of the Southern Party of the Canadian Arctic Expedition (1913-16) were among the last people to observe the Copper Eskimos' prehistoric way of life. Diamond Jenness, the ethnologist of that expedition, subsequently wrote a book about the primitive people he lived with. In closing, he asked "Were we the harbingers of a brighter dawn, or only the messengers of ill-omen, portending disaster?"[1] It is hoped that this thesis will illuminate some of the present problems of the people of Coppermine and Holman, and the forces which brought them about, thereby helping to answer the question Dr. Jenness posed almost fifty years ago.

Method

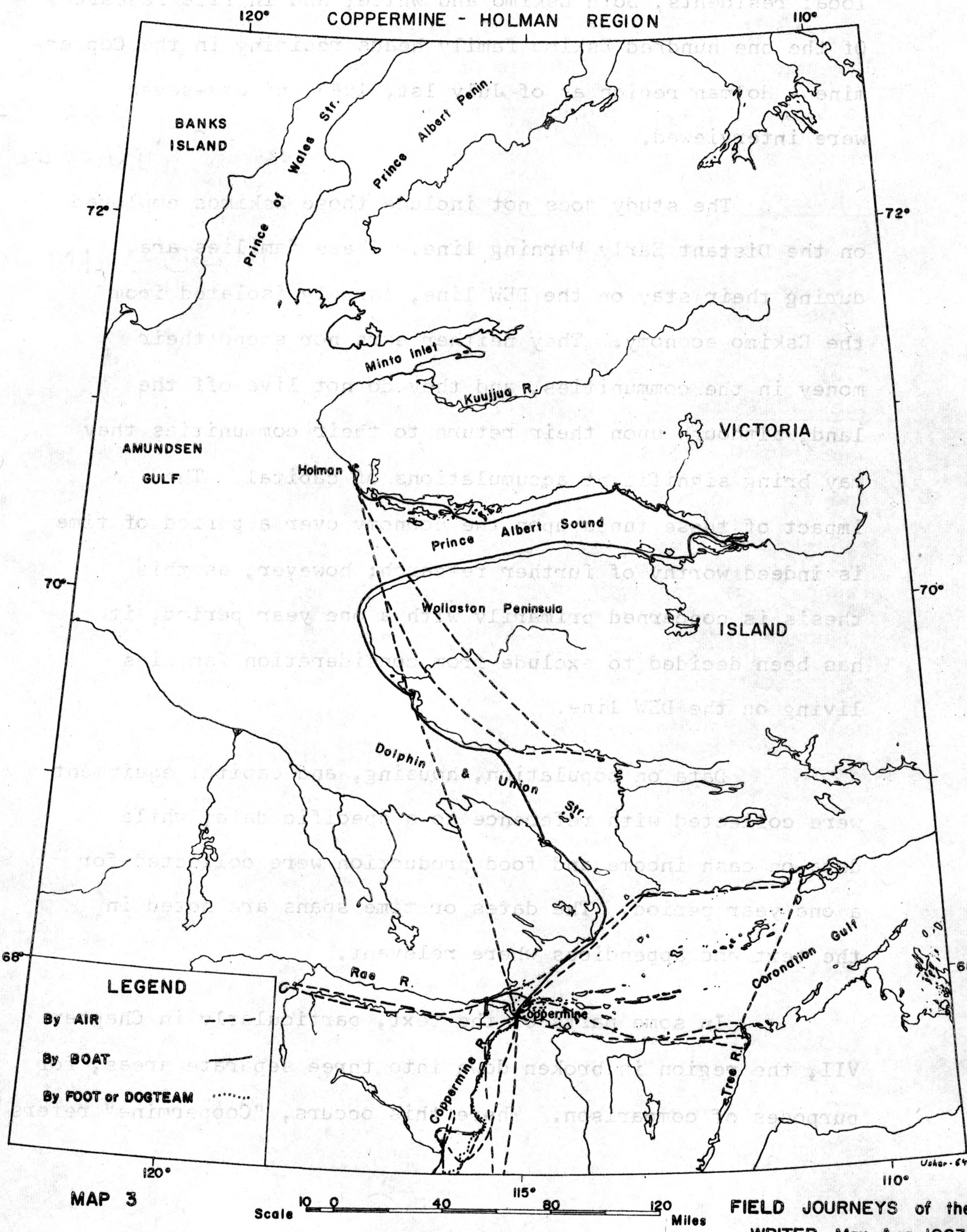
This thesis is based on the writer's field work done while engaged in an "Area Economic Survey" (hereafter referred to as "Area Survey") for the Industrial Division, Northern Administration Branch, of the Canadian Dept. of Northern Affairs and National Resources, from May to September, 1963. This particular survey, which covered the entire area inhabited by the Copper Eskimos, was conducted by three field parties. Messrs. D.J. McIntosh and P.J. Gillespie were in the Bathurst Inlet and Perry River areas;

[1] D. Jenness, The People of the Twilight, New York, 1928, p.247.

Mr. H.A.Williamson was in the Contwoyto Lake and Cambridge Bay areas; while Mr. Gunther Abrahamson and the writer were in the Coppermine and Holman areas. The consolidated report of the three parties appeared in February 1964 as The Copper Eskimos, an Area Economic Survey, 1963. The present study is concerned only with the areas visited by the writer himself (see Map 3).

Parts of this thesis have already appeared in The Copper Eskimos, notably Chapter I, parts of Chapter V, the statistical compilations and maps in Chapters III, VI, and VII, and appendices A, C, D, and part of J, of that report. This material, for which the present writer was responsible, is incorporated here with out further acknowledgement. Other information used here from the report is identified in footnotes. Some of the writer's photographs used in this thesis have already appeared in the report.

About six weeks of the field season were spent in Coppermine, and about two at Holman. Several trips by aeroplane, boat and dogsled were made to outlying camps in the Coppermine area, and two longer journeys were also made: the first to investigate timber on the Coppermine River, and the second for the purpose of test-netting for fish on the Wollaston Peninsula coast and in Prince Albert Sound. Most of the time spent in the settlements was used in interviewing



MAP 3

FIELD JOURNEYS of the WRITER, May-Aug. 1963 local residents, both Eskimo and white, and in file research. Of the one hundred Eskimo family heads residing in the Coppermine - Holman region as of July 1st, 1963, ninety-seven were interviewed.

The study does not include those Eskimos employed on the Distant Early Warning line. These families are, during their stay on the DEW line, largely isolated from the Eskimo economy. They neither earn nor spend their money in the communities, and they do not live off the land, although upon their return to their communities they may bring significant accumulations of capital. The impact of these funds upon the economy over a period of time is indeed worthy of further research; however, as this thesis is concerned primarily with a one year period, it has been decided to exclude from consideration families living on the DEW line.

Data on population, housing, and capital equipment were collected with reference to a specific date; while data on cash income and food production were collected for a one year period. The dates or time spans are noted in the text and appendices where relevant.

In some parts of the text, particularly in Chapter VII, the region is broken down into three separate areas, for purposes of comparison. Where this occurs, "Coppermine" refers only to the village of Coppermine; "Coppermine camps" refers to all outlying camps in the Coppermine trading area, but excludes the village itself; while "Holman and camps" refers both to the settlement and to its trading area.

During the years 1963 and 1964, further research was done in the McGill University Library, Montreal; the Arctic Institute of North America Library, Montreal; and the Dept. of Northern Affairs and National Resources Library, Ottawa. In addition, the writer was granted access to the Current Files of the Northern Administration Branch, Dept. of Northern Affairs and National Resources, Ottawa, and to the fur and game records of the Game Management Service of the Government of the Northwest Territories, Fort Smith.

CHAPTER I

THE PHYSICAL BACKGROUND

In our increasingly urban society it is easy to forget the influence of landscape and climate upon daily life, for in the city we are no longer bound by the forces of our environment. The indoor life of our cities continues almost entirely without reference to the weather, and by tunnelling and blasting and bulldozing we can overcome or avoid most physical barriers.

This is not the case at such outposts of human habitation as the Canadian Arctic. We dream of bubble-domed cities in the north, with their own tropical climates, but in reality the eyes of the Eskimos still scan the land and the sky for signs of tomorrow's travelling conditions. At Coppermine; at Read Island; at Holman; winds, temperatures, snow cover and ice conditions are of fundamental importance in everyday life. Strong winds on open water forestall boat travel and make seal hunting impossible. In spring, a sudden thaw can render the overland traveller's sled useless, while an unusual autumn storm can break and raft the young ice so as to create difficulties for travel through the rest of the winter. The protection afforded by a river valley can make it an important travel route, while a long, unbroken escarpment may require several extra hours of dogsled travel to circumvent it. An extensive sandy plain may be an ideal habitat for foxes, which will influence the location of traplines, and areas with favourable vegetation may be grazed by caribou.

It is thus impossible to discuss the life and economy of these Eskimos without an understanding of their physical environment. The purpose of this chapter is to present a brief account of the climate, landscape and vegetation of the Coppermine - Holman region. Mention will also be made of such restricted resources as minerals, water and timber, in order to dispel any illusions about the potential wealth to be found in this area.

Climate

Two criteria used for delimiting the boundary of the Arctic and the Sub-arctic are the northern-most limit of trees, and the fifty degree isotherm for mean daily temperatures in July. These boundaries broadly coincide throughout the north and this is equally true of the survey region. The tree line swings from the north of Great Bear Lake to the Kendall River and then southeastwards along the Coppermine, with the exception of the immediate valley of the Coppermine which is wooded to within twenty miles of its mouth; the fifty degree isotherm (uncorrected to sea level) follows roughly a line from Dismal Lake to Contwoyto Lake. By either criteria, the region now inhabited by the

Copper Eskimos lies entirely within the Arctic region. In general it may be said that the climate becomes increasingly harsh towards the northeast part of the study area.

Climatic data for the region are relatively limited. At Coppermine, the Department of Transport has operated a meteorological station since 1930, in addition to a radio station which issues marine and flight conditions and forecasts on request. At Holman, the Hudson's Bay Company has kept observations for the D.O.T. since 1940. DEW line stations in the region commenced regular temperature and precipitation observations between 1955 and 1957. From the perimeter of the region, continuous records are available for Cambridge Bay since 1936, Port Radium since 1938, Sachs Harbour since 1955, and Contwoyto Lake since 1958. Table 1 indicates the data recorded at these sites. Climatological tables and graphs for Coppermine and Holman will be found at the end of this section.

The climate of the region is predominantly maritime in summer, although in winter the freezing over of the ocean greatly reduces this moderating maritime effect.

The winters are cold, although the months of December and January are colder at such sub-arctic stations as Aklavik and Fort Good Hope than at Coppermine, and the record low at Winnipeg is four degrees colder than that at Holman, 1500 miles to the north. Thus the winters are

TABLE 1.--Meteorological stations in and near the Coppermine - Holman region, July 1963

Station	Lat.	Long.	Type of Observation: Precipitation	Temperature	Synoptic	Hourly Winds	Sunshine	Years of Observation
Coppermine	67°45'	115°05'	x	x	x	x	x	33
Holman	70°44'	117°38'	x	x	x	x		23
Clifton Point	69°12'	118°38'	x	x				6
Cape Young	68°56'	116°56'	x	x				8
Bernard Harbour	68°47'	114°50'	x	x				6
Lady Franklin Point	68°30'	113°13'	x	x				7
Ross Point	68°35'	111°06'	x	x				6
Cambridge Bay	69°06'	105°08'	x	x	x	x		27
Port Radium[a]	66°05'	118°00'	x	x				24
Sachs Harbour	71°57'	124°44'	x	x	x	x	x	8
Contwoyto Lake	65°28'	110°24'	x	x	x			5

[a]Station recently closed.

Source: Dept. of Transport, Met. Branch, Monthly Record, July, 1963 Toronto.

characterized not by extreme low temperatures, but by the persistence of almost continuous sub-zero temperatures from early November until mid-April. If winter is taken as that period during which mean daily temperatures are below 32°F, then this season is just over eight months at Coppermine and almost nine at Holman. This compares to six months at Yellowknife, five at Winnipeg, four at Montreal and none at Vancouver. Expressed in terms of heating requirements, the number of degree days below 65°F at Holman is well over 20,000, and at Coppermine over 19,000, as opposed to 9,000 at Montreal and 11,000 at Winnipeg.[1] This means at least twice as much fuel is required to keep the same structure at a minimum temperature of 65°F in the study area as it does in southern Canada.

The coldest month is February, and the warmest is July. For a little under three months, from mid-June to the first week in September, the region experiences a cool, pleasant summer. While freezing temperatures may occur in any of these months, a summer day can occasionally warm to seventy or even eighty degrees.

A notable aspect of the climate is the very low precipitation. Total annual precipitation ranges from about

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[1] McGill University, Department of Geography, A Report on the Physical Environment of the Great Bear River Area, Northwest Territories, Canada, Prepared for U.S. Airforce Project Rand, Memorandum RM-2122-1-PR, Santa Monica, Cal., 1963, p.66.

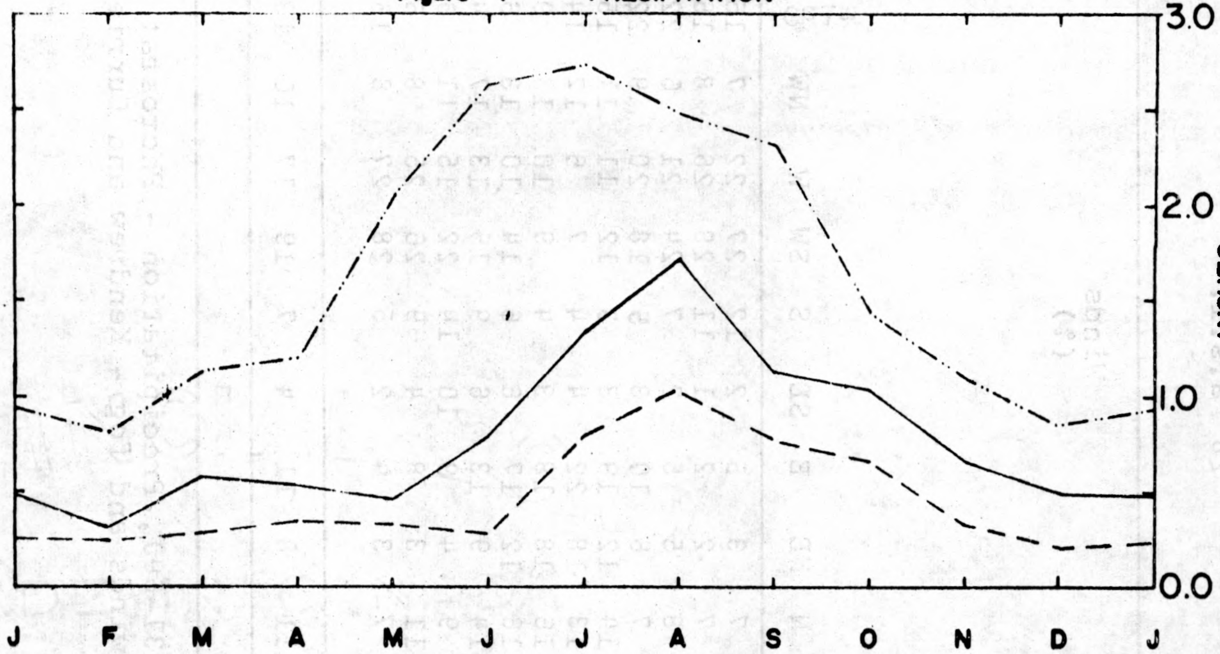
five to ten inches in the study area, decreasing to the northeast and falling in about equal proportions of snow and rain. Such figures would, under a temperate regime, indicate desert conditions, however, the high permafrost table, poor drainage in many areas, the storage of water in the form of snow for nine months of the year, and the low evaporation rate combine to ensure a sufficient water supply in most places for summer vegetation.

Summer rain occurs over most of the area in the form of sporadic showers or a continual drizzle, although the mainland does experience thunderstorms on occasion. New snow is fine and granular, and although drifting due to winds is considerable, blizzards such as are experienced in areas near open water are infrequent.

Cloudiness is significantly greater at all stations from June to October than during the winter. Coronation Gulf and Victoria Island tend to be characterized either by a completely clear or a completely overcast sky. The mainland is more likely to experience continental summer weather -- hot summer days, heavy cumulus clouds building up in the afternoon, and occasional thunderstorms. Fog is most frequent from April to September at Coppermine, and is particularly associated with the open water period. The higher incidence of fog in winter at Holman is possibly due to open water which is reported to exist periodically in Amundsen Gulf between Nelson Head and Cape Parry.

TEMPERATURE & PRECIPITATION

Figure I PRECIPITATION



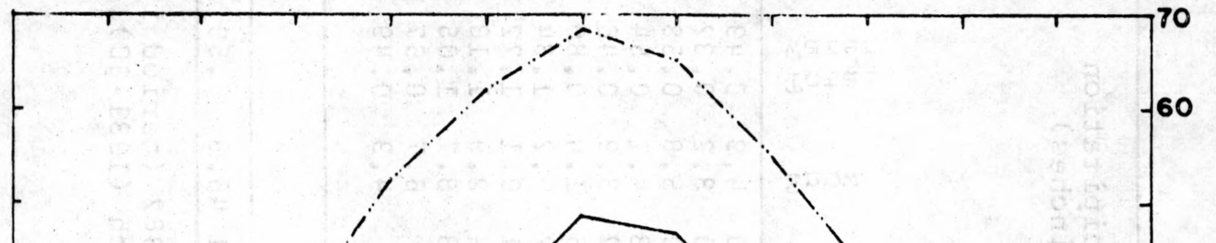


Figure 2 TEMPERATURE

Coppermine, N.W.T. —— Holman, N.W.T. – – – Winnipeg, Man. –··–··–

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TABLE 2 Climate data COPPERMINE 67°49'N, 115°05'W. 28' a.s.l.

	Temperatures (degrees F.)					Precipitation (inches)			Winds (%)									
	Daily Mean	Mean Daily Max.	Mean Daily Min.	Extreme Max.	Extreme Min.	Rain	Snow	Total Water	N	NE	E	SE	S	SW	W	NW	Calm	No. Days w. fog, viz. ≤ 1 km.
Jan.	-19.4	-12.3	-26.5	27	-54	0.00	4.9	0.49	7	3	5	2	12	27	22	7	15	<1
Feb.	-22.1	-14.8	-29.3	34	-58	0.00	3.2	0.32	7	2	2	1	11	28	26	8	15	1
Mar.	-14.5	- 6.8	-22.1	29	-56	0.00	5.8	0.58	8	5	5	2	7	24	21	6	22	1
Apr.	1.0	9.8	- 7.9	46	-47	0.13	4.1	0.54	7	6	10	3	5	18	20	9	22	2
May	21.9	28.9	14.9	74	-24	0.07	3.9	0.46	14	12	19	3	3	12	11	11	15	3
Jun.	38.1	44.6	31.6	82	5	0.66	1.4	0.80	13	18	22	4	4	7	6	12	14	3
Jul.	48.7	56.0	41.3	87	31	1.32	0.2	1.34	16	18	18	3	4	9	10	13	9	2
Aug.	47.1	53.7	40.5	83	27	1.71	0.1	1.72	16	12	17	6	6	14	10	13	6	2
Sep.	36.6	41.5	31.6	79	7	0.84	2.9	1.13	14	9	13	6	9	15	13	17	4	2
Oct.	19.5	24.8	14.2	57	-28	0.18	8.7	1.05	9	4	9	10	14	22	15	11	6	1
Nov.	- 3.9	3.0	-10.8	36	-42	T	6.7	0.67	11	3	8	4	9	26	25	8	6	1
Dec.	-15.3	- 8.3	-22.2	31	-49	T	4.9	0.49	7	3	4	2	5	28	27	8	16	1
Mean	11.5	18.3	4.6						11	8	11	4	7	19	17	10	13	
Extreme or total				87	-58	4.91	46.8	9.59										19

Sources: Temperatures - H.A.Thompson, 1962 (period 1931-60), Precipitation - Photostat of records of Dept. of Transport, Met. Branch (1931-60), winds and fog - Kendrew and Currie, 1955 (1930-50)

TABLE 3 Climate data **HOLMAN** 70°44'N, 117°38'W.
30' a.s.l.

	Temperatures (degrees F,)					Precipitation (inches)			Winds (%)									
	Daily Mean	Mean Daily Max.	Mean Daily Min.	Extreme Max.	Extreme Min.	Rain	Snow	Total Water	N	NE	E	SE	S	SW	W	NW	Calm	No. Days w. fog, viz. ≤ 1100 yds.
Jan.	-19.2	-13.1	-25.2	18	-45	0.00	2.5	0.25	13	6	36	8	4	4	11	10	8	2
Feb.	-23.7	-17.1	-30.2	28	-50	0.00	2.4	0.24	12	6	28	6	9	3	14	11	11	2
Mar.	-14.8	- 7.9	-21.7	24	-48	0.00	2.9	0.29	9	4	35	7	9	5	15	7	9	2
Apr.	0.5	7.7	- 6.8	40	-35	0.00	3.5	0.35	6	3	46	7	8	5	12	7	6	1
May	21.2	26.8	15.5	54	-13	0.04	2.9	0.33	5	4	39	14	6	7	12	11	2	1
Jun.	38.7	44.6	32.7	71	13	0.21	0.8	0.29	6	7	22	12	7	11	20	11	2	1
Jul.	45.3	52.2	38.3	78	27	0.79	0.1	0.80	7	7	17	7	11	15	23	9	4	3
Aug.	44.0	49.8	38.2	75	24	0.96	0.8	1.04	3	7	24	13	9	10	21	11	2	3
Sep.	32.8	36.8	28.8	63	8	0.47	3.2	0.79	12	9	26	12	4	4	13	19	1	1
Oct.	16.1	20.7	11.4	42	-13	0.04	6.4	0.68	9	10	47	10	1	3	9	10	1	2
Nov.	- 3.9	1.3	- 9.0	28	-38	0.00	3.3	0.33	12	10	47	9	2	2	7	7	4	1
Dec.	-13.5	- 8.1	-18.9	19	-48	0.00	2.2	0.22	9	7	44	12	3	3	9	9	4	2
Mean	10.3	16.1	4.4						9	7	34	10	6	6	14	10	4	
Extreme or total				78	-50	2.51	31.0	5.61										21

Sources: Temperatures - H.A.Thompson, 1962 (period 1941-60), Precipitation - Photostat of records of Dept. of Transport, Met. Branch (1941-60), winds and fog - R.W.Rae, 1951 (1941-50)

Winds at Coppermine are predominantly from the west and southwest in winter, and from the east and north in summer. This is probably true for the entire region. The predominance of east winds at all times at Holman is almost certainly a local phenomenon, being a gravity wind descending from the interior uplands to sea-level.

Summer winds have an important bearing on seal hunting, as this activity becomes impossible in very choppy waters. An analysis of daily wind speeds would be necessary to arrive at any definite statement of the number of days in which seal hunting cannot be conducted due to wind. The critical windspeed, above which seal hunting is not attempted, would also have to be determined.

Daylight and Darkness

The relationship between daylight and darkness varies considerably between latitudes 66° and 73° north, the approximate limits of the study area. The Takiyuak Lake area, just south of the Arctic Circle, experiences long days in summer and long nights in winter, but sunrise and sunset occur every day of the year. At Coppermine, the sun appears above the horizon continuously for six weeks in summer, and remains below it for about three weeks in winter; the difference being due of course to refraction. Even on the shortest day, there is twilight for three to four hours. Further north, the extremes become greater. At Holman, the sun is continuously visible from early May to early August, and is out of sight from late November to mid-January. No Eskimo who has wintered at Richard Collinson Inlet (about 73°N) fails to remark on the difficulty of travelling in December and January when there is no twilight at all. Under such circumstances, the snow-reflected light of the full moon in winter is taken advantage of for travelling whenever possible.

Tides and Currents

Tide-ranges throughout the study area are negligible. Reports from various stations indicate tides ranging from one and a half to three feet, but two feet is the most common. Water level is affected more by winds than by tides. A high wind, particularly a northwesterly of a few days duration, will raise water levels in Amundsen Gulf and Coronation Gulf by at least four feet. A tidal range of four to five feet was observed by the area survey at the mouth of the Kagloryuak River between Aug. 16 and 19, 1963. It is not known whether this was due only to the strong west wind blowing at the time or to any possible funnelling effect of the long, narrow, Prince Albert Sound.

Currents are also of minor significance in the region. A weak, easterly drift along the south shore of Amundsen Gulf divides near Victoria Island. One branch continues through Dolphin and Union Strait and Coronation Gulf, and the other sets northward to Prince of Wales

Strait.[2] This current follows the Victoria Island side of Prince of Wales Strait to Melville Sound. A south-westerly setting current has been noted along the Banks Island shore of the Strait; a phenomenon which allows polar pack ice to drift down occasionally. The passage of this ice to Amundsen Gulf, however, is blocked by a shoal between Banks Island and the Princess Royal Islands.[3] Strong currents at the eastern end of Dolphin and Union Strait in the vicinity of Douglas Island restrict the formation of ice there, and renders the crossing from Lady Franklin Point to Cape Krusenstern unsafe even in late winter. Some other places in the area are known to have strong currents locally, creating similar conditions, but these do not pose any serious restrictions on travel.

Ice Conditions

In winter, virtually all bodies of water in the study area are frozen over. Exceptions are the central part of Amundsen Gulf, and the eastern end of Dolphin and Union Strait, where thin ice or open water may occur even late in the winter. The sea freezes over quite evenly, and rough, broken ice is seldom encountered. There are several reasons

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[2]United States, Hydrographic Office, Distribution of Ice, Amundsen Gulf to Shepherd Bay, TR-25, Washington, 1955, pp.4-5.

[3]Canada, Dept. Mines and Technical Surveys, Hydrographic Service, Pilot of Arctic Canada, Vol. III, Ottawa, 1961, p.89.

for this. In most years, ice melts completely throughout the region, and ice from the polar pack almost never enters these waters. Thus the absence of any old or pack ice allows a new, smooth surface to form each fall. Winter ice is not subject to the pressures of the polar pack or to storms on adjacent bodies of open water, so that there is little rafting or ridging. The small tidal range also results in the general absence of tide cracks such as may be found in the eastern Arctic. There is sufficient stress to open occasional leads in winter, but these freeze over quickly. Very rarely, a severe storm will break up the ice early in winter so that when it refreezes the surface is rough and jagged. In such conditions it was difficult to find seal holes or to travel, which in former years meant hunger and famine to the Eskimos.

Once freezeup has taken place, the depth of the sea ice increases in a quite regular manner (see Figure 3). On the average, sea ice in the region does not grow to a thickness much greater than 80 inches, although at Holman the ice was 87 inches thick in late May, 1961.

Markham states that "Breakup in Dolphin and Union Strait and Eastern Amundsen Gulf appears to be primarily controlled by spring temperatures with some assistance from mean wind speed although wind direction does not appear to be significant.", but that "The total freezing degree days during the winter or . . . winter wind would appear to have little

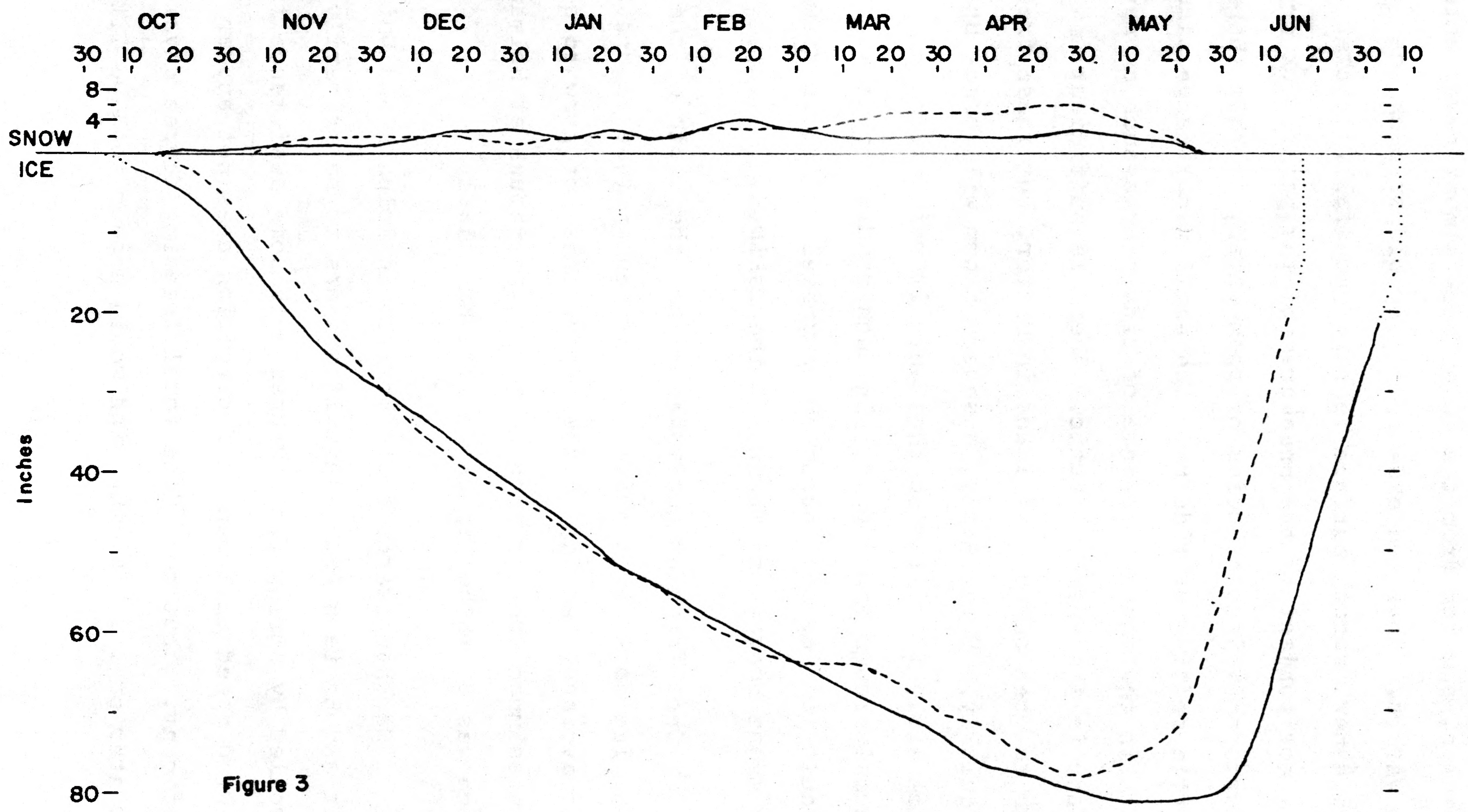

Figure 3

AVERAGE DEVELOPMENT of SNOW COVER and ICE DEPTH, 1960-63

COPPERMINE - - - - -

HOLMAN ———

Source: Dept. Transport, Met. Branch records

Usher-64

significance."[4]

The snow melts in May, and the rivers begin to run in June, rendering overland journeys by sled impossible, but the sea remains ice-bound until July and even August in some parts of the study area. The first melting takes place at rivermouths, where warmer fresh water gradually melts the sea ice in a widening radius. Soon the whole shoreward edge of the sea ice has melted, and canoe travel is feasible along the coast. Cracks in the ice have appeared by this time, and the ice is covered with pools of water. The entire pack may now be shifted by winds, which will ultimately break it up. Sometimes, within a few days, a heavy wind smashes the ice to pieces which quickly melt; in other cases the broken ice may linger until late in summer, to be blown from place to place by the winds.

At Coppermine, the river melts the ice in front of the settlement around mid-June, although the ice a few miles out is still solid. Melting also occurs at the mouth of the Rae, and canoe travel is possible between the two points about the first week in July although it can be earlier. The first open water over a considerable area occurs at the western entrance to Coronation Gulf, due to strong currents,

[4]Markham, W.E., Summer Breakup Patterns in the Canadian Arctic, CIR-3586, TEC-389, Dept. of Transport, Meteorological Branch, Toronto, 1962, p.3.

in early July. During July, ice remains in varying concentrations in Amundsen Gulf, Dolphin and Union Strait, and Coronation Gulf. By the end of the month, these waters are largely ice free, although shifting ice tends to linger in Simpson Bay in the area of Read Island. Break-up occurs earlier to the west of the study area, and later to the east of it. In a good year ships can reach Coppermine from the Mackenzie Delta by the third week of July. The western side of Victoria Island may suffer from drifting ice in August due to late break-up in Prince Albert Sound, Minto Inlet, and Prince of Wales Strait. The north side of Victoria Island is never ice free, except for the heads of bays, and there is no record of any boats penetrating Richard Collinson Inlet or Wynniatt Bay.

Ice on inland lakes generally melts and freezes earlier than does the sea ice, although on some of the larger lakes ice persists until late in the season.

Some average dates for break-up and freeze-up are given in Table 4 below. It should be noted that dates vary considerably from year to year. Dates of break-up and freeze-up for Coppermine for every year since 1930, and for Holman since 1940, will be found in Appendix A.

Large cargo vessels sail these waters until late September and even into October. August, however, is the best month for small schooner navigation, as September tends

TABLE 4.--Mean Dates of Break-up and Freeze-up at Specified Points

Break-up is understood to mean the date when the body of water is clear, or that the ice is sufficiently dispersed to allow the movement of small boats without danger. Where two dates are given, the first indicates the date on which the first signs of breakup occur, such as the opening of leads or extensive melting.

Freezeup is understood to mean the date on which the body of water is completely covered with ice. Where two dates are given, the first indicates the date on which young ice first forms along the shore.

Place	Break-up	Freeze-up
Coppermine[a]	June 11-19	Oct. 1-21
Holman (Kings Bay)[b]	early July	Oct. 21
Holman (water lake)[b]	?	Sept. 30
Port Radium (Great Bear Lake)[c]	June 21-July 10	Oct. 29-Nov.17
Walker Bay[d]	late July	early Sept.
Prince Albert Sound[d]	Aug. 1	early Sept.
Read Island[d]	mid-July	Oct. 25
Bernard Harbour[d]	early July	mid Sept.
Port Epworth[d]	July 10	early Oct.
Point Lake[e]	1st.week July	end Sept.
Takiyuak Lake[e]	3rd.week July	2nd.week Sept.
Dismal Lake[e]	2nd.week July	1st.week Oct.
small mainland lakes[e]	2nd.week July	mid-Sept.

[a] based on Dept. of Transport, Met. Branch records since 1930.
[b] based on Dept. of Transport, Met. Branch records since 1940.
[c] based on Dept. of Transport, Met. Branch records since 1952.
[d] From Pilot of Arctic Canada, Vol. III, Canadian Hydrographic Service, Ottawa, 1961; reliability unknown.
[e] Estimated in A Report on the Physical Environment of the Great Bear River Area, N.W.T., Canada, McGill University, Dept. of Geography, prepared for U.S. Airforce Project Rand, Memorandum RM-2122-1-PR, Santa Monica, 1963.

to be very stormy.

Freeze-up takes place over a period of a few weeks, beginning with thin ice formation along the shore, particularly in bays and river estuaries. On a calm day, ice forms quickly on a large body of water. A storm may break up the young ice while it is still thin, when the water is calm again, ice reforms until it is thick enough to withstand the stress of high winds. By the first of November the ice is thick enough to bear a man and his dog-team, and winter travel can begin. Snow falls begin in September, and in a few weeks the ground is well covered.

Physiography

The mainland part of the region, except for the area north of about 68°, lies along the northwest margin of the Canadian Shield. The landscape of the lower Coppermine River area is very distinctive, consisting of shales and red sandstones, interspersed with intrusive basalt flows. These flows dip northward at a shallow angle, and have weathered to produce south facing scarps.

The Coppermine and September Mountains, suggested to be of the Lower Coppermine Series[5], are characterized by frequent, thin basalt flows. The weathering of these has resulted in dozens of successive scarp faces, one above

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[5] M. Marsden, A Geographical Survey of the South Shore of Coronation Gulf, Between 111°00'W and 115°45'W, M.Sc. Thesis, McGill University, 1956, p.50.

the other, reaching a maximum elevation of about 1800 feet above sea level. These successive faces strongly resemble steps when viewed from the south or from the air, and indeed the Eskimo name for them is "Tummerkrait", meaning "like steps".[6]

Further north, in the Upper Coppermine Series, the basalt flows are much more widely spaced (several miles apart in most cases), and they are much thicker (some scarp faces are over one hundred feet high). A prominent and more or less continuous scarp runs from the Escape Rapids to the East Kugaryuak River, and also forms the promontory at Port Epworth. Other important scarps are those at Bloody Falls and Coppermine, and those which form the arc of islands in Coronation Gulf extending from Coppermine to the south shore of Victoria Island at about 110°30'W.

South of this scarp region lies a large area of rocky country with little overburden. Varied relief and rock types are encountered but in general the land in this area rises gradually toward the south, and is studded with a myriad of lakes. Hilly areas occur south of Tree River and Dismal Lake, while the granite areas are essentially flat but are characterized by joint patterns accentuated by erosion.

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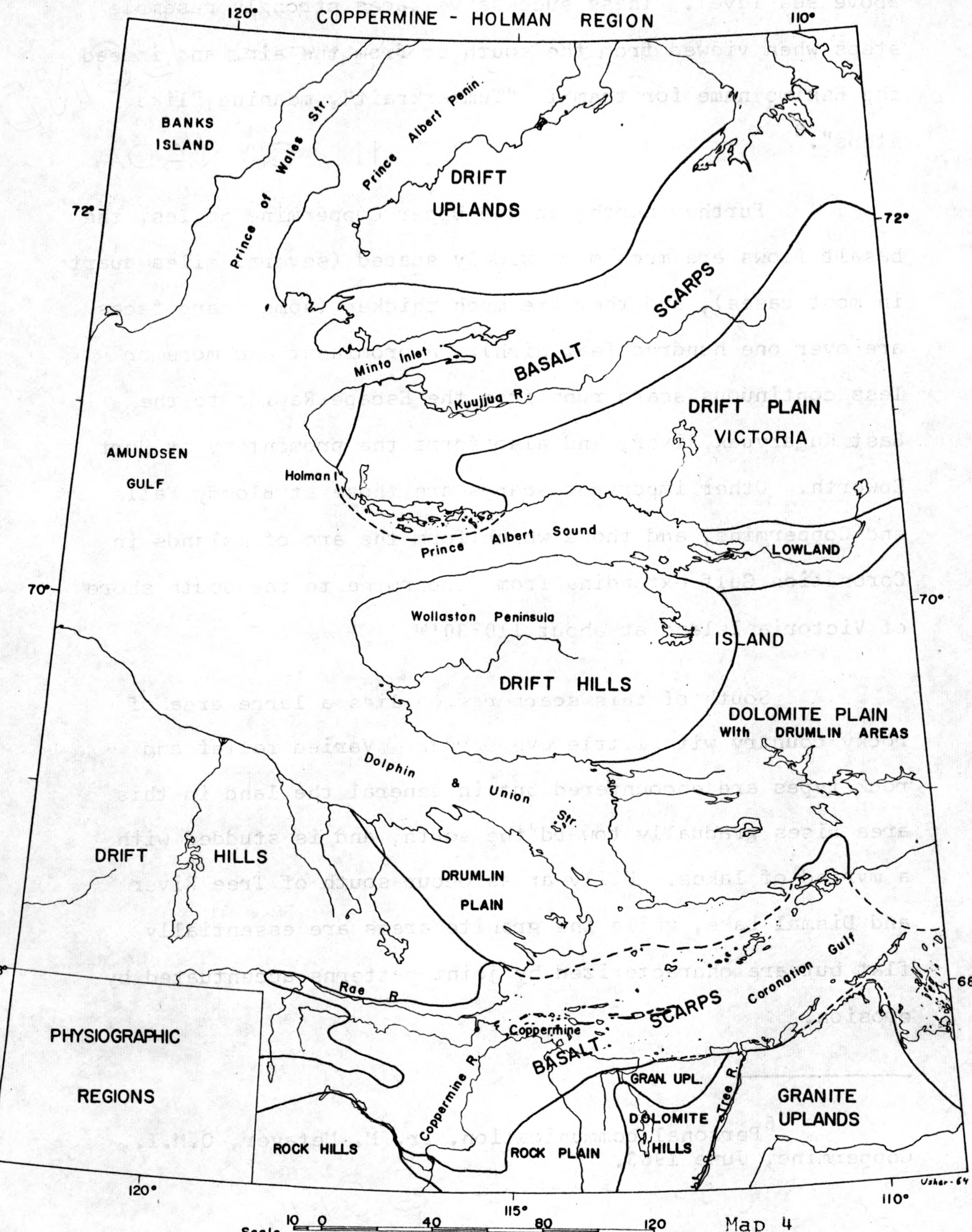
[6]Personal communication, Fr. M. Metayer, O.M.I., Coppermine, June 1963.


COPPERMINE - HOLMAN REGION
120°
110°
72°
70°
68°
115°
BANKS ISLAND
Prince of Wales Str.
Prince Albert Penin.
DRIFT UPLANDS
BASALT SCARPS
Minto Inlet
Kuujjua R.
BASALT
DRIFT PLAIN
VICTORIA
AMUNDSEN GULF
Holman I
Prince Albert Sound
LOWLAND
Wollaston Peninsula
ISLAND
DRIFT HILLS
DOLOMITE PLAIN
With DRUMLIN AREAS
Dolphin & Union Str.
DRIFT HILLS
DRUMLIN PLAIN
Rae R.
Coronation Gulf
SCARPS
Coppermine
BASALT
PHYSIOGRAPHIC
REGIONS
Coppermine R.
GRAN. UPL.
Tree R.
GRANITE UPLANDS
DOLOMITE HILLS
ROCK HILLS
ROCK PLAIN
Usher-64
Scale 10 0 40 80 120 Miles

Map 4

The region north of the Rae River consists, for the most part, of a low, rolling, and rather monotonous landscape, as does much of Victoria Island. Bedrock, (mainly limestones and dolomites), seldom occurs at the surface, as it is often covered by drift; and where it does occur it is almost buried beneath its own frost-shattered rubble. This rubble is generally in the form of thin, hard plates, perhaps six inches across, which can quickly lacerate the toughest boots. West of about Cape Young, on the mainland, is a region of drift covered hills, which are similar to those found on Wollaston Peninsula. East of Cape Young, and including southern Victoria Island, the land is lowlying, and relief is provided by widespread drumlin fields.

Northern Victoria Island is largely a drift covered area of little relief, although it is broken by a region of scarps developed on what are primarily basalt intrusives, ranging from Holman Island to the north end of Hadley Bay. The landscape in this area is extremely rugged, with scarp faces hundreds of feet in height not infrequent. As in the Coppermine scarp region, well developed scree slopes are often found at the foot of the scarps. The Holman scarp region is synclinal, so that except for a small anticline north of Minto Inlet, the scarps face outwards at the margins of the region.

Broadly speaking, it may be said that rock controlled forms dominate the scenery on the shield and in the Holman scarp region, and that Pleistocene glacial deposits are dominant in the other areas, which are of Paleozoic age. There are, of course, some glacial forms on the shield such as moraines and particularly eskers, which are striking in their abundance. The Paleozoic areas, however, are largely covered with deep glacial drift. Drumlin fields are numerous and in some cases spectacular. Post-glacial emergence in this part of the Arctic has amounted to as much as 600 feet.[7] In the shield areas where bedrock generally occurs at the coast, this emergence is not readily detected. Where the shoreline consists of till or limestone rubble, however, the raised beachlines are ubiquitous and well preserved.

The scarp areas clearly impose the greatest restrictions on travel. When the Coppermine Eskimos used to visit Great Bear Lake, they generally followed the Coppermine River Valley to the vicinity of the Muskox Rapids, and then skirted the north slope of the Coppermine Mountains overland to Dismal Lake. Travel northwest of Holman is restricted along the "grain" of the country. Certainly an overland road to Coppermine from the south would be an expensive undertaking, as a passage would have to be blasted through every major scarp.

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[7] J.G.Fyles, Surficial Geology of Victoria and Stefansson Islands, Geological Survey of Canada, Bull. 101, Dept. Mines and Technical Surveys, Ottawa, 1963, p.28.

The flatter Paleozoic areas generally provide good dogsled travelling country. In addition, raised beaches in coastal areas could provide, and indeed have provided, excellent sites for airstrip construction.

Major River Systems

The region's rivers have provided important travel routes for both Eskimos and European explorers. They are also of importance to the Eskimos for fishing, and hence river mouths were frequently the sites of seasonal groupings, and later, of trading posts and settlements. Any future large scale development or colonization will be governed to some extent by the navigability of these rivers and by their hydro-electric power potential.

The Coppermine River

The Coppermine River is the longest river in the region, and has a drainage basin of 29,000 square miles in extent. The river rises at Lac des Gras, south of Contwoyto Lake, flows through a number of lakes including Point and Redrock Lakes, and then winds its way to the sea, flowing over 400 miles in all. It continues without a major drop until it reaches the Big Bend, where it begins its real descent to the sea. Swift water occurs at various spots before reaching the Rocky Defile Rapids, a spectacular canyon of about one quarter mile in length. Below this the river becomes sluggish again, flowing through a maze of shoals where the Kendall River enters. The river deepens and narrows as it passes between the September and Coppermine Mountains. After the river turns north again, it drops 500 feet in its last forty miles to the sea, thus having an average gradient of almost thirteen feet per mile over that distance.

The first rapids in the lower valley are the Muskox Rapids, which are followed by the Sandstone Rapids. Between Sandstone and Escape Rapids, a distance of about fifteen miles, the river is completely unnavigable except by canoe during high water. Rapids alternate with shoals, and the river flows through a canyon with sheer walls reaching to 200 feet above the river. Once the banks have been ascended to circumvent the first set of rapids, it is impossible to descend to the occasional stretch of quiet water until the other end of the gorge has been reached. The only other hazard after this section is the Bloody Falls, about eleven miles from the mouth. In reality a set of rapids rather than a falls, it is nonetheless the most dangerous section of the river.

Below Bloody Falls, the river cuts through the silts of what appears to be an old raised delta. The present delta of the Coppermine consists of a few lowlying islands of mud, the larger of which are covered with grasses and willows. Some of the islands have small hills which are, in fact, a continuation of the scarp on which the village of Coppermine is situated. The main distributary is the west channel, which flows directly in front of the settlement.

The east channel may be forded at low water.

The Rae and Richardson Rivers

The Rae River rises east of Bluenose Lake, and flows eastward to Coronation Gulf. The Richardson rises northwest of Dismal Lake and flows northward for a short distance until it curves eastward and flows parallel to, and about ten miles south of, the Rae River. The easterly courses of both rivers are controlled by the scarps in the area, and the two rivers have a common mouth in Richardson Bay, just northwest of Coppermine. The Rae, which is the longer of the two, is about 150 miles in length. The first rapids on the Rae are close to the mouth, but the Richardson is probably navigable by small boat for about thirty miles. Both rivers are shallow in their upper reaches and can probably be forded at low water.

The Tree River

The Tree River has its source in a maze of lakes about sixty miles southwest of Coronation Gulf. The river can be navigated by small boats for a few miles, but there are rapids six miles from the mouth, and a fall of about sixteen feet just above them. The Tree River empties into Coronation Gulf at Port Epworth, a fine deep harbour offering excellent shelter.

Other Mainland Rivers

Other rivers on the mainland flowing to the Arctic coast in this region are small and of minor significance. Between the Coppermine and the Tree, from west to east, lie the Nipartoktuak, the Big or West Kugaryuak (known on official maps as the Asiak but hereafter called the West Kugaryuak), and the Little or East Kugaryuak (hereafter called the East Kugaryuak). The last two named river valleys are traditional Eskimo travel routes from the coast to the Takiyuak and Contwoyto Lake areas. All three river courses are influenced near their mouths by scarps, and all three are unnavigable.

The four main rivers entering Amundsen Gulf between Stapylton Bay and Clinton Point are as follows, from east to west: The Harding River, which drains a moderate sized lake with no official name but which the Eskimos refer to as "Imariuk", meaning "small sea".[8] West of the Harding lies the Hoppner, then the Inman, and finally the Crocker, which drains Bluenose Lake. These rivers drop fairly sharply in their lower courses and in some cases have sandy deltas completely impassable by boat.

Rivers of Victoria Island

Dunbar and Greenaway state that "The drainage of

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[8]Personal communication, Fr. M.Metayer, O.M.I., Coppermine, June, 1963.

Victoria Island is very confused. Most of the rivers follow poorly defined courses through a maze of lakes, and are hard to plot from the air."[9] The longest river in the area under consideration is the Kuujjua, which rises in the Shaler Mountains south of Wynniatt Bay. It is about 160 miles long, and widens into a series of three lakes just above its mouth on the south side of Minto Inlet. Rapids near the mouth render this river unnavigable.

Two winding streams rising in central Victoria Island combine to form the Kagloryuak River, which enters the east end of Prince Albert Sound. The estuary is navigable by small schooner only with difficulty, and both forks of the river have rapids within a mile above their confluence.

The main drainage system on Wollaston Peninsula is the Kugaluk River, which is a shallow, winding stream, braided throughout much of its course.

The only other streams of any length in the area are those emptying into Richard Collinson Inlet in the north.

Navigation and hydro-electric power potential

From the above descriptions we may conclude that there are no rivers in the area which may be considered navigable for commercial purposes. In addition, hydro-electric power potential is extremely limited. The only site which could be

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[9] M.Dunbar and K.R.Greenaway, Arctic Canada from the Air, Ottawa, 1956, p.207.

considered for development is that at Bloody Falls. Here the river drops twelve feet in 300 yards, but the gorge is deep and a head of eighty feet could be developed. Measurements were made in 1932, 1935, and 1936 by the R.C.M.P. for the Dominion Water and Power Bureau, which showed a minimum flow of 1700 c.f.s. with 2550 c.f.s. available six months of the year. It was calculated that this flow could provide 12,400 HP at ordinary minimum flow and 18,500 at ordinary six month flow.[10] However, such calculations remain quite academic, as the need for such a quantity of power would arise only from a commercial mineral development, or a several-fold expansion of the community of Coppermine. The likelihood of either is negligible to say the least, as will be further elucidated below.

Minerals

Copper and soapstone both played an important role in pre-contact Eskimo technology, and the former was the initial cause of European exploration in the region. Stefansson termed the native inhabitants the Copper Eskimos, because of their use of free copper for knives, ulus, spear and arrowheads, fishing tridents, and similar implements.[11]

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[10] North Pacific Planning Project, Canada's New Northwest, Ottawa, 1947, pp. 82-83.

[11] V. Stefansson, Prehistoric and Present Commerce Among the Arctic Coast Eskimos, National Museum Bulletin no. 6, Ottawa, 1914a, p.13.

This copper was to be found in a free state in the lower Coppermine Valley, and north of Prince Albert Sound, in conjunction with the basaltic intrusions. Periodic discoveries of large copper nuggets at the surface kept alive the hopes of an immensely rich copper find in the area for a century and a half following Hearne's journey. However, the Douglas expeditions of 1911 and 1912, and later intensive exploration by others between 1929 and 1931 showed that native copper was extremely limited in its extent. Ore bodies of chalcocite and bornite were discovered, but not in sufficiently large or rich concentrations to warrant development. A few exploration companies have revisited the area since, but have not made any significant new discoveries. Most of the claims that were staked have lapsed, although a few are still in good standing.[12]

It is safe to say that copper in the area will remain unexploited during the foreseeable future. The cost increment incurred by mining the ore in permafrost conditions; building and maintaining a road or railroad either to Coronation Gulf or Great Bear Lake, and then shipping the ore out over bodies of water frozen for most of the year, would simply not allow this ore to compete on a world or even national market.

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[12]Personal communication, George Trick, Office of the Mining Recorder, Dept. Northern Affairs and National Resources, Yellowknife, N.W.T., August, 1964.

Known deposits of soapstone occur at Fish Bay on the north side of Minto Inlet, and at the mouths of the East Kugaryuak and the Tree Rivers in Coronation Gulf. Soapstone was traditionally used in the making of lamps and pots, and these deposits are still worked to provide the raw material for carvings.

A number of mining companies are at present prospecting for gold in the area between the upper Coppermine River and Bathurst Inlet, particularly around Contwoyto Lake. Should any active development stem from this activity, Eskimos from Coppermine and the surrounding area would almost certainly be employed.

Since the introduction of the rifle, and of other metal objects, the use of copper by the Eskimos has sharply declined, and one rarely sees a copper implement any more. Soapstone is now used much less for such necessities as pots and lamps than in pre-contact times, although it is now the basis of the carving industry. In general, local minerals have declined in importance to the Eskimos. So far these minerals have not formed the basis of a mining industry, and undoubtedly will not in coming years, although future mineral development outside the study area may affect the local people.

Vegetation

Several types of vegetation communities exist within the study area. They are relevant to this discussion inasmuch as they provide favourable or unfavourable habitat for the animals upon which the Eskimos depend. South of Coppermine there are wooded areas, and we must determine whether lumber could become a worthwhile resource to the local population.

The treeline lies to the north and east of Great Bear Lake, and includes the upper Coppermine River within its limits. Finger-like extensions reach toward Dismal Lake and down the Coppermine Valley toward its mouth. North of the treeline, vegetation ranges from dense stands of willows at the western end of Coronation Gulf to the simple lichens found in rocky areas otherwise devoid of vegetation.

No trees grow on Victoria Island. The scarp areas are the most barren, supporting only lichens, and some mosses where overburden occurs. The Paleozoic areas of Victoria Island, and of the mainland, appear from the air to be utterly barren except for occasional green patches, presumably grasses, around lakes. Ground observations on the coast of Wollaston Peninsula bear out aerial observations, but the interior of the Peninsula is apparently different. Porsild states that "Rocky-strewn barren flats of weathered Paleozoic rocks that from the air may look entirely devoid of vegetation, on closer inspection from the ground may reveal extensive colonies, often arranged in 'islands' or stripes, of mountain aven (Dryas Integrifolia) or loco-weed (Oxytropis Arctic) and O. Arctobia)."[13] In any case, the interior supported large

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[13] A.E.Porsild, "Plant Life in the Arctic",

herds of caribou in the summers until migration across the straits ceased fifty years ago.

There are certain areas on Victoria Island which support denser vegetation; namely the lower valley of the Kagloryuak and the east end of Prince Albert Sound, where lichen and moss heath communities are common. Such areas provide good walking ground, being relatively firm and dry underfoot. Small willows are reported to grow at the head of Minto Inlet.

The shield area on the mainland supports many types of communities. The bare rock surfaces of the scarps support only lichens, but in flat lying areas, both lichen and moss heath and dwarf shrub heath are common. This latter type is a moisture loving community, consisting of grasses, sedges, and "niggerheads", which are tussocks of grass growing in marshy areas. These render walking extremely arduous as the tussocks are too closely spaced to walk in between them, but widely spaced enough so that they give way underfoot.

Tundra vegetation is at present of little economic importance to the region since the decline of the caribou herds and of the Eskimos' dependence on them. Two types of tundra vegetation have been used by the Eskimos for heat and light. The tufts of the cotton grass (Eriophorum) were picked and used as wicks for the seal oil lamps. In addition, Jenness

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Canadian Geographical Journal, Vol.42,No. 3, March 1951, p.133.

describes the use of Dryas Integrifolia for fuel on Victoria Island when nothing else was available.[14] This plant is almost certainly no longer used for fuel.

In protected river valleys near the treeline, willows grow to a height of five to six feet, in heavy clumps. They are commonly found near the mouth of the Coppermine, and particularly at the mouths of the Rae and Richardson. This last area is called "Padlek" by the Eskimos and means "place where there are willows".[15] The woody stems of the willows are gathered and dried for fuel by some families.

In June 1963, the writer was engaged in a timber survey along the lower 120 miles of the Coppermine River (see Map 5). Within the wooded parts of the study area, the common species is white spruce. Between the Big Bend and the Rocky Defile Rapids, timber stands are relatively heavy. The trees are closely spaced, and the underbrush, which consists both of small plants and fallen dead trees, is quite dense. Below Rocky Defile, good stands are less frequent, and the trees within them are more widely spaced, thus having the appearance of a parkland community. The last stand is on the right bank of the river just above the Escape Rapids. Most trees are between

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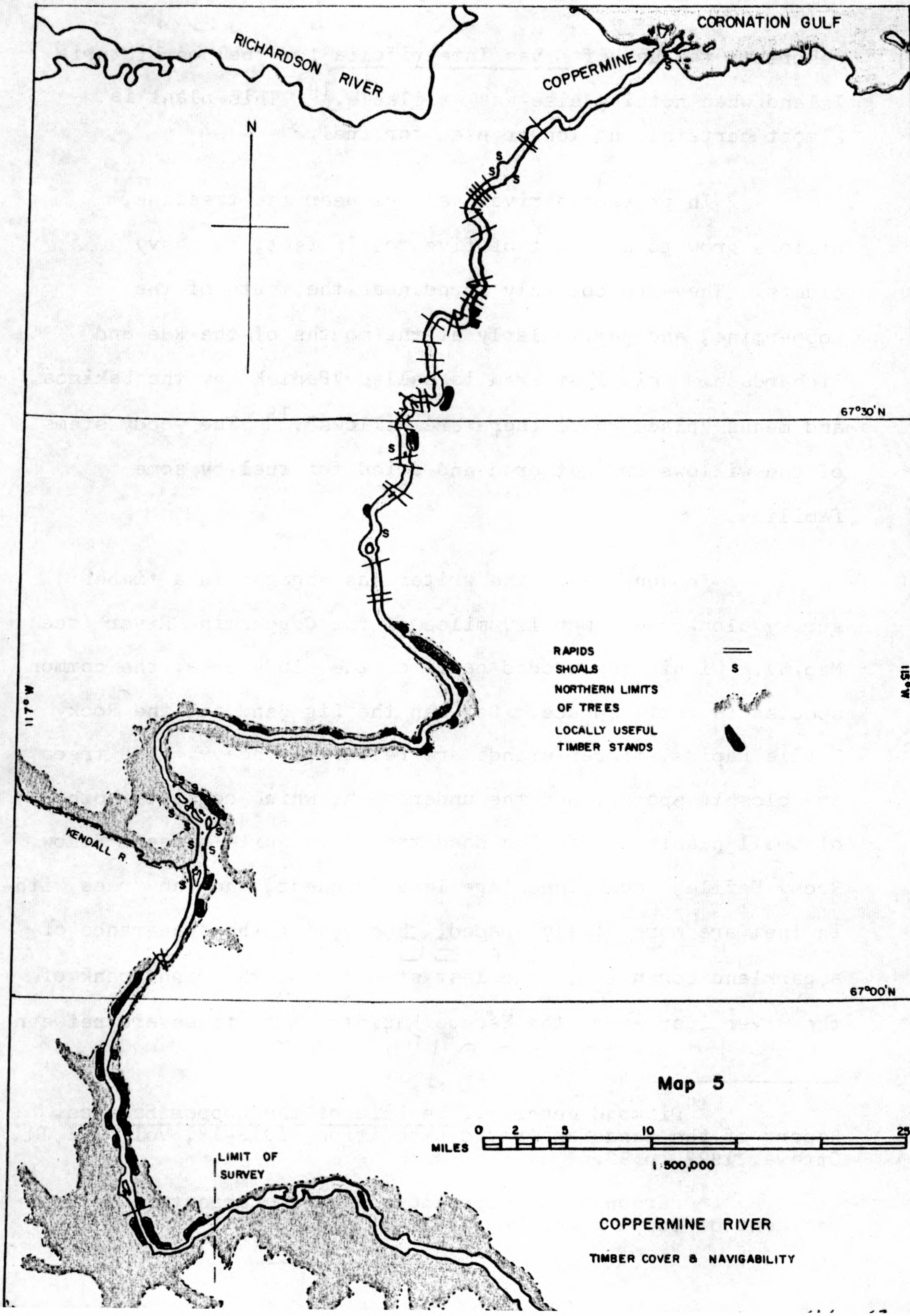
[14]Diamond Jenness, The Life of the Copper Eskimos, Report of the Canadian Arctic Expedition, 1913-18, Vol. XII, Pt. A, Ottawa, 1922, p.98.

[15]Personal communication, Abraham Carpenter, Eskimo resident of Coppermine, May 1963.



Map 5

COPPERMINE RIVER

TIMBER COVER & NAVIGABILITY

twenty-five and thirty-five feet high, and are generally between three and six inches in diameter at breast height, although a few are over a foot thick. Their growth is exceedingly slow, and it is not uncommon for a tree of four inches in diameter to be 300 years old.

The confinement of trees to the valley appears to be due mainly to the availability of moisture and deeper soils, and to protection from strong winds. Of these, protection from winds is almost certainly the most significant. The occasional trees seen on the plateau above the river valley generally grow along the ground almost as a bush. Those that stand upright are no more than two to four feet high, and all have had their bark blasted off by driven snow between eighteen and twenty-four inches above the ground. The effects of wind-driven snow at this level probably indicates the average snow depth on the treeless plateau. The existence of dead trees and stumps at the limits of tree growth likely signifies a receding, rather than an advancing, treeline.

The use of timber was an integral part of the Copper Eskimo technology. These Eskimos came from as far away as Victoria Island and Bathurst Inlet to gather timber in the headwaters of the Dease River south of Dismal Lake, and presumably in the Coppermine Valley, to collect wood for sleds, bows, and spearshafts.[16] While this is no longer true, the

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[16] V.Stefansson, <u>My Life with the Eskimo</u>, New York, 1913, p.215.

Coppermine timber is still of potential value to them, both as a source of fuel and for house-building. During the winters of 1960-62, the area administrator at Coppermine organized parties to cut logs about 35 miles up river. These logs were placed on the ice to be carried down in the spring breakup. Much of the timber was either destroyed by ice during its journey down river, or was carried out to sea and lost.[17] Logging on the river is quite feasible, but floating the logs down river is fraught with complications due to ice, shoals and rapids. An individual competent in such procedures could doubtless offer recommendations concerning the proper harvesting and transporting of logs on the river, but the operation would be economically marginal in any case. The sustainable yield could well prove insufficient even for local use at the settlement, let alone for any small-scale commercial development.

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[17] G.Abrahamson et.al., The Copper Eskimos, an Area Economic Survey, 1963, Dept. Northern Affairs and National Resources, Industrial Division, 1964, p.74.

CHAPTER II

THE HISTORICAL BACKGROUND

Although Europeans first reached the Arctic Ocean by way of the Coppermine River, the Copper Eskimos remained unaffected by the white man longer than any other group of Eskimos except perhaps the Netsilingmiuts of King William Island and Boothia Peninsula. Other routes to the Arctic proved more feasible. Hudson and Davis Straits invited early penetration by explorers, whalers and traders, while Bering Strait and the Mackenzie River brought the white man into contact with the Western Eskimos.

The traders and missionaries did not reach the study area until 1916, just under fifty years ago. Within this short space of time, a stone age people (technically they were in a pseudo-metal age because they used free copper, although hammered cold[1]) have had to adjust to a twentieth century way of life, replete with doctors, rifles, welfare cheques, and aeroplanes. Their present economy, and mode of resource exploitation, cannot be appreciated without an

[1]Diamond Jenness, "Origin of the Copper Eskimos and their Copper Culture", Geographical Review, Vol. 13, No. 4, Oct. 1923, p.540.

understanding of their former way of life, and the changes it has undergone through contact with the white man. This chapter discusses the pre-contact life of the Eskimos, early exploration, colonization of the area during the first half of the twentieth century, and the changes which took place in the Eskimo economy during this time, and finally, new trends in the economy and mode of life which have arisen in the last decade.

The Pre-Contact Period

The origin of the Copper Eskimos is not altogether clear, although Jenness, Rasmussen, and Birket-Smith are in general agreement that these people (along with the Netsilingmiuts of King William Island and Boothia Peninsula) must have been an inland group which arrived at the coast perhaps within the last 1000 years. Certainly there is evidence that although they lived on the sea, they had not adapted their culture to the sea as had the Alaskan Eskimos or the Eskimos of the Eastern Arctic. They were at home on the sea in winter, when it was frozen over, but they had neither the large boats nor the knowledge required to hunt sea mammals in the open water. Rather, they spent their summers inland, and lived on caribou meat and fish for almost half the year.

The Copper Eskimos as a group are distinguished, as previously mentioned, by their use of native copper, hammered cold, for certain implements. The traditional economy was a hunting economy, and they followed their food supply with the seasons. In winter, they lived on the sea-ice, in snow houses. Their source of food during winter was the ringed seal, and occasionally the larger bearded seal, or "ugyuk". Caribou and fish, which they brought with them from inland, supplemented the diet of seal meat, but could only be eaten cold or frozen because of a tabu against cooking them on the sea ice.

Large groups gathered on the ice in winter to seal; for example Stefansson relates finding a village of over fifty snow houses off Cape Bexley in 1910.[2] Periodically the groups moved a few miles to new sealing grounds during the winter. The community life of these Eskimos would culminate around March, when visiting and trading between groups would take place. By late April sealing was over and the groupings would split up into families again, which moved back to the coasts to prepare for the summer season. In May, when the snow melted, sled travel became impossible on land, and the sled, along with winter gear and pokes of seal blubber, was cached near the shore. Home became the skin tent, and the dogs were used for packing instead of hauling.

A typical summer might have begun by jigging for fish with a hook and line on the still-frozen lakes. Then as the caribou migrated north, efforts were made to secure meat.

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[2]V. Stefansson, 1913, <u>op.cit.</u>, p.168

In July and August, when the fish were running, stone weirs were built in streams, and the trapped fish were speared. The return of the caribou in September or October would be the occasion for another hunt, then the Eskimos would return to their caches on the coast to prepare for the winter. By early November they had moved out on the ice again and sealing could begin.[3]

The region inhabited by the Copper Eskimos extended in the north to the Prince Albert Peninsula, and all of western and southern Victoria Island was occupied in summer. On the mainland, the Eskimos ranged as far west as Cape Bexley, although Stefansson feels that there had been trade relations with the Mackenzie Eskimos up until about 1840.[4] However, by the early twentieth century the Copper Eskimos and the Mackenzie Eskimos knew of each others' existence only by hearsay and folktale, and had had no communication during their lifetimes. The Eskimos hunted inland from Cape Krusenstern and in the valley of the Coppermine River, ranging as far inland as the Dease River and the shores of the Dease Arm of Great Bear Lake. In this area they occasionally met Indians, but these two groups preferred to avoid each other, and their relations were by all accounts

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[3]The finest description of the traditional way of life may be found in Diamond Jenness, 1922, op.cit. Chapters 3,4,9,10 and 11 describe the distribution of the Eskimos, and their seasonal movements and methods of hunting.

[4]V.Stefansson, The Stefansson-Anderson Arctic Expedition of the American Museum; Preliminary Ethnological Report, Anthropological Papers of the American Museum of Natural History, Vol. 14, Pt.1, New York, 1914b, p.33.

unfriendly. The Copper Eskimos also lived eastward, in Bathurst Inlet, the Kent Peninsula, and the Queen Maud Gulf. However the people east of Gray's Bay on the mainland and Richardson Islands off Victoria Island will not be discussed in this paper. There was, however, frequent contact across this line, which at that time was in no way a boundary between peoples.

Exploration by Europeans

Eighteenth and Nineteenth Centuries

Copper was, as has been said, the initial stimulant to exploration in this region. Native copper was used not only by the Eskimos but also by the northern Athapaskan Indian tribes. Through trade, copper implements reached as far as Hudson Bay.

Tyrell states that the use of copper by the Indians was known to the French as early as 1714, while they were temporarily in control of York Factory on Hudson Bay.[5] The Indians brought copper implements to the post and spoke of copper mines far to the northwest. When the English reoccupied the Factory, Richard Norton was sent out in 1717 in search of these mines, and may have reached the upper Coppermine River. During the eighteenth century, the fables of vast copper

[5] J.B.Tyrell, "The Coppermine Country", Canadian Institute of Mining and Metallurgy, Transactions, Vol. 15, 1912, p.510.

deposits grew. In 1769, Samuel Hearne was instructed by Moses Norton, the governor at Fort Prince of Wales, to find the copper mines and to report on the possibilities of exploiting them. After two abortive attempts, Hearne, with his Indian guides, reached the Coppermine River on the 14th of July, 1771. Having expected to see actual hills of copper pebbles, he was most disappointed by the copper deposits he found, which were, he stated, 29 or 30 miles south-southeast of the mouth of the River.[6] After a considerable search, he managed to find a piece of copper weighing four pounds. In addition, he found the river to be not a great highway to the sea, but a series of unnavigable rapids and shoals.

Hearne followed the Coppermine River down as far as Bloody Falls, so named by him because his party of Chipewyan guides fell upon a sleeping encampment of Eskimos there and massacred them. That he actually reached the Arctic Ocean, eleven miles beyond, is questionable because of his unrealistic description of the coast, although he at least saw it from the crest of the ridge through which Bloody Fall cuts.

No other European came for fifty years, until, during the Royal Navy's assault on the northwest passage,

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[6] Samuel Hearne, A Journey from Prince of Wales Fort in Hudson's Bay to the Northern Ocean, London, 1795, p. 173.

Sir John Franklin led two expeditions to the "Polar Sea". On the first, in 1821, based at Fort Enterprise north of Great Slave Lake, he descended the Coppermine River from Point Lake. Reaching the sea, he turned eastward, to Bathurst Inlet, returning to Point Lake overland.

During the second Franklin expedition of 1826, the party led by Richardson and Kendall mapped the entire coast from the Mackenzie River to the Coppermine, travelling in two small boats, the Dolphin and the Union. Theirs was the first party to sight Victoria Island, from Cape Bexley, on August 4th, 1826.[7] Richardson named it Wollaston Land, and the peninsula he saw retains this name. The party ascended the Coppermine River in August and portaged via Dismal Lake to Great Bear Lake.

Dease and Simpson used the Coppermine as their route to the sea in 1838 and 1839, when they explored the coast east of the Kent Peninsula. To the north of Kent Peninsula they sighted land, which they called Victoria Land.[8]

The next phase of exploration was the search for the lost Franklin expedition of 1845. The efforts of the mainland parties included Richardson in 1848 retracing his

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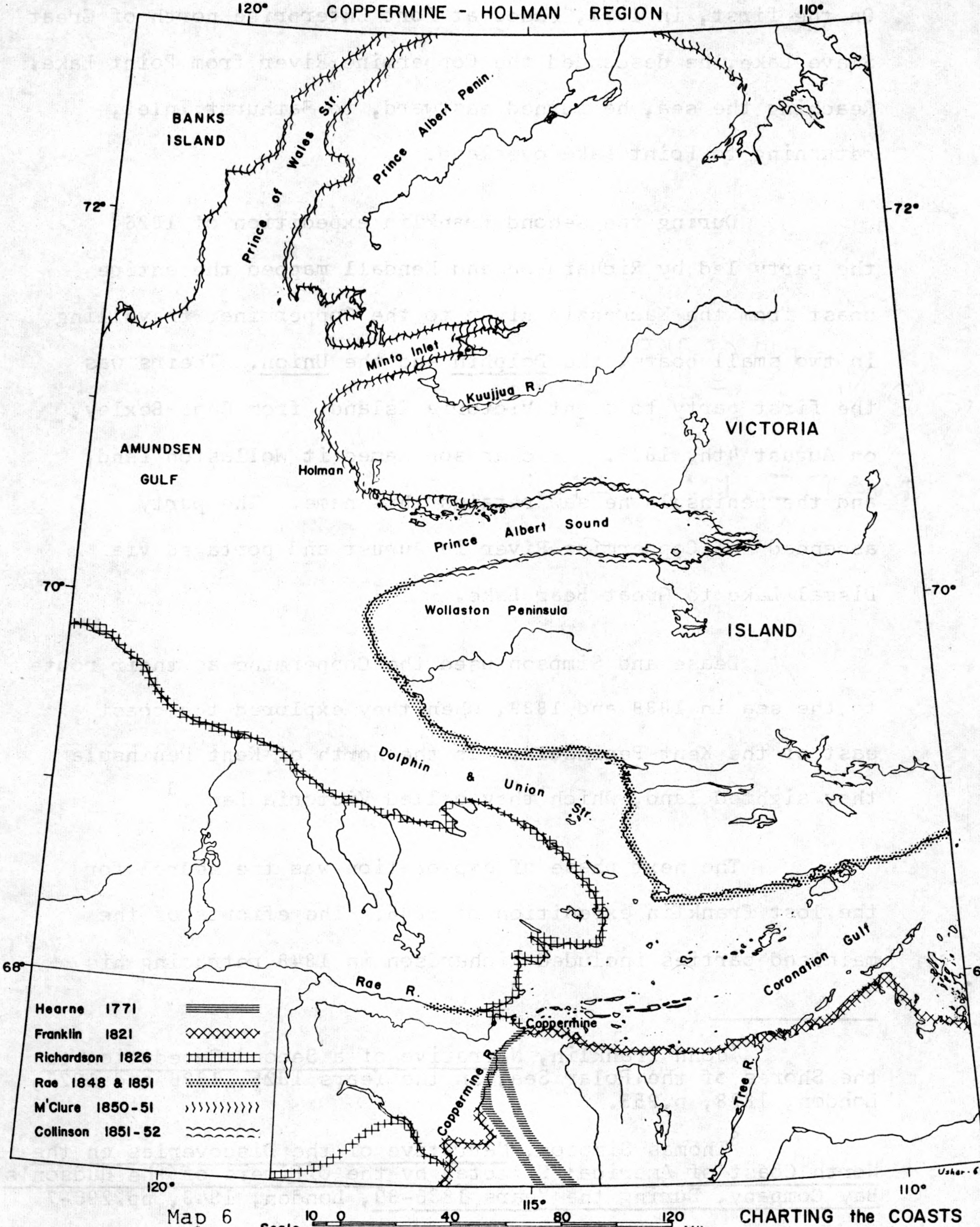
[7] John Franklin, Narrative of a Second Expedition to the Shores of the Polar Sea, in the Years 1825, 1826 and 1827, London, 1828, p.253.

[8] Thomas Simpson, Narrative of the Discoveries on the North Coast of America; Effected by the Officers of the Hudson's Bay Company, During the Years 1836-39, London, 1843, pp.296-7.



Map 6

CHARTING the COASTS PRIOR to 1900

journey of twenty-two years before, and Rae in 1851 mapping much of the south and west coast of Victoria Island. Descending the Coppermine River in early May of that year, Rae sledged across Coronation Gulf and surveyed the coast as far east as the Richardson Islands, forming a link with Dease and Simpson's Victoria Land. He retraced his steps west to Lady Franklin Point, and then turned northward, following the coast around Wollaston Land into Prince Albert Sound as far as Cape Back. By doing so he proved that Victoria Land and Wollaston Land were one and the same land mass, and in addition he sighted the north shore of Prince Albert Sound, but thought that the sound was a channel. In fact Haswell had reached this north coast ten days before, although this was unknown to Rae at the time.[9]

In 1850 a search party was sent around by the Bering Sea, and included M'Clure commanding the Investigator and Collinson commanding the Enterprise. M'Clure sailed east to Amundsen Gulf and entered Prince of Wales Strait, wintering there in 1850-51. During that spring, sledge parties explored the coasts. Wynniatt reached the bay now named after him, and Haswell explored Minto Inlet and the north side of Prince Albert Sound. In 1851 M'Clure sailed southward out of the straits and almost circumnavigated

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[9] Alexander Armstrong, A Personal Narrative of the Discovery of the Northwest Passage, London, 1857, p.334.

Banks Island before having to abandon his ship in Mercy Bay on the north coast of that island. Collinson wintered in Walker Bay in 1851-52, and the following summer explored Prince Albert Sound before proceeding on to Cambridge Bay, where he spent the next winter. In 1853 he sailed out of Coronation Gulf on his return to the Bering Sea. Thus ended the period of exploration by the Royal Navy in this region. The coastline had been mapped in its essence, as had the Coppermine River and the portage to Great Bear Lake (see map 6).

For fifty years afterwards the region was left unvisited and unexploited, although advance guards of the white man's civilization had already crept in. The Copper Eskimos had become familiar with iron, which during the 19th century, had entered the country from the east in the course of trading, by way of the Netsilingmiuts, the Caribou Eskimos of the Keewatin, and the trading posts on Hudson Bay. The early explorers, many of whom met Eskimos, also brought iron into the area, in the form of such objects as scissors and knives. Another source of iron was the abandoned <u>Investigator</u> in Mercy Bay. Thus the people now knew of the white man, by his artifacts and by hearsay, and some had even seen him; although of his customs and civilization they remained almost totally unaware.

The Early Twentieth Century (1900-1916)

With the dawn of the twentieth century, a new era began. The white man came not as an explorer, but as a traveller, as a scientist, as a trader; seeking to know the country and use it. Such people as Bell, Camsell, Hanbury and Amundsen passed through the region between 1900 and 1905, although none stayed for more than a few days or perhaps weeks.

To the west, in the Beaufort Sea, many boats came annually to hunt the bowhead whale. This animal did not travel as far west as Victoria Island, and so neither did the whalers. In 1905, however, a remarkable gentleman by the name of Christian Klengenberg (often referred to incorrectly as Klinkenberg in books of the time) sailed west in the schooner Olga and was not seen for another year. Upon returning to Herschel Island, he told of a winter spent on Victoria Island (in Penny Bay on the west coast of Wollaston Peninsula) where he had seen and traded with "blond" Eskimos. Captain William Mogg, who later took command of the Olga, wintered in Minto Inlet in 1907-08, and also returned with stories of the "blond" Eskimos.

Vilhjalmur Stefansson, the famous ethnographer and explorer, was at Herschel Island when Klengenberg returned, and resolved to see for himself this curious race of people. On his second Arctic expedition, he reached Dolphin and Union Strait in May of 1910, where he met Eskimos. He spent that summer with them, and returned in the spring of 1911 with R.M.Anderson. During these visits, he travelled with the Eskimos throughout the region between Prince Albert Sound and Great Bear Lake, and came to know the people as no white man had before. He noted many Eskimos with such uncharacteristic features as grey or blue eyes, and red or brown hair, and offered the explanation that the lost Greenland colony of the middle ages had intermarried with Eskimos and migrated to Victoria Island. Such theories made excellent news copy, and the public was treated to numerous articles about this race of people, embellished by the press in no small way. The controversy raged for years, and other ethnographers who visited the area disagreed with Stefansson's theory, ascribing these Eskimos' "blondness" to genetic accidents or to pathological causes such as snowblindness.[10] These latter views have since prevailed.

With the invention of a substitute for baleen, the whale market collapsed in 1906, and the important resource of the Western Arctic became the white fox. The whalers either left the Arctic or became trappers and traders. Captain Joe Bernard, one of those who remained in the north, stayed at the mouth of the West Kugaryuak in the schooner Teddy Bear in the winter of 1910-11, and at Bernard Harbour in 1912-13, trading with the Eskimos.

Contact from Great Bear Lake was also made. The

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[10] For a review of this problem, see V.Stefansson, "The 'Blond' Eskimos", Harpers Magazine, Vol. 156, Jan. 1928, pp.191-8.

adventurers Hornby and Melvill travelled to the September Mountains in 1909, and there were the Douglas expeditions of 1911 and 1912, in search of copper. At this time Fathers Rouviere and LeRoux were also preparing to descend the Coppermine. These two Catholic missionaries had been sent out to convert the new-found Copper Eskimos, and in the fall of 1913 met their death at the hands of two Eskimos near Bloody Fall. This resulted in the first N.W.M.P. patrol in Coronation Gulf, when Corporal "Denny" LaNauze went in to investigate their disappearance, in the spring of 1916.[11] By this time, traders such as D'Arcy Arden had established themselves at Dease Arm of Great Bear Lake, and were trading with the Eskimos between there and the coast.

Between 1914 and 1916 the Southern Party of the Canadian Arctic Expedition was stationed at Bernard Harbour. For two years intensive studies were made in many scientific fields, such as ethnography, geography, geology, botany and zoology. The reports of the expedition remained the definitive works on region for many years, and some indeed remain so today.

The Anglican church was also anxious to convert the Eskimos, and in 1915 sent in a party of three men: Girling, Merritt and Hoare. They wintered near the Croker River and in 1916 had established themselves in the Bernard

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[11] For an account of this incident, see G.Whalley, The Legend of John Hornby, Toronto, 1962, pp.349-54.

Harbour area.

The Contact-Traditional Period (1916-1950)

The contact-traditional period, as it has been termed by anthropologists, is understood to be that stage of the meeting of the Eskimo and European cultures during which the hunting economy continues to hold sway, although its technological basis may have been radically altered.

History of Settlement

Although such individuals as Klengenberg and Bernard had already traded with the Eskimos in a rather desultory manner, the first permanent trading posts in the region were not established until 1916, when the Hudson's Bay Co. opened Fort Bacon at Bernard Harbour[12] and Klengenberg built a post at the mouth of the Coppermine.[13] The following year the H.B.C. opened a post at Agiak, near Gray's Bay, and the Northern Trading Co. opened at Tree River. This latter post closed within a year and the H.B.C. took it over, abandoning their post at Agiak.[14] Six years later, the Bay opened in Prince Albert Sound[15] at "Alaervik"

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[12] P.H.Godsell, Arctic Trader, New York, 1934, p.222.

[13] W.H.B.Hoare, Report of Investigations Affecting Eskimo and Wildlife, District of Mackenzie, 1924-25-26, unpublished mimeo., Dept. Interior, N.W.T. and Yukon Branch, Ottawa, no date, p.33.

[14] ibid., p.33.

[15] An account of the founding of this post may be found in P.H.Godsell, 1934, op.cit., pp.280-1, although his

(local Eskimo name),[16] and Klengenberg moved to Rymer Point. During these years, there were almost certainly individual trader-trappers operating in the region, bringing trade goods to the Eskimos by sledge or boat rather than building a permanent store.

The next fifteen years was a period of intense competition in the area, characterized by the establishment, and often failure, of many new posts. At least 51 posts operated in the area at one time or another, and perhaps thirty additional trading licences were taken out but never used. Of all these posts, only two remain. Captain Pedersen's Canalaska Trading Company, the Klengenbergs, and L.F.Semmler all operated chains of posts in competition with the Hudson's Bay Company, and many individuals were trading also. This was the era of the free traders, as all individuals not associated with the H.B.C. came to be known. By 1950, "The Bay" had triumphed completely, primarily because of its greater size and ability to withstand the losses incurred by such disasters as bad fox years, bad ice years when supply vessels could not get in, or even the loss of a supply vessel. However, the fact that the Company had

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notion that he was at the Kagloryuak is definitely in error. All maps showing the post place it at the mouth of a river entering Prince Albert Sound at 70°39'N, 113°30'W, and indeed the writer observed the remains of the post at that place.

[16] Personal communication, Fr. H.Tardy, O.M.I., Holman, July, 1963.

had to operate posts at fourteen different locations during that time bears witness to the ferocity of the struggle.

Pedersen and Klengenberg were both bought out by the Company, and Semmler's posts failed, and he withdrew from the area entirely in 1948. The Catholic missions at Holman and Coppermine operated posts but did very little trading, and indeed ceased trading altogether in 1950. Of the Bay's many posts, the three most important and long-standing ones were at Coppermine, Holman, and Read Island, and even this last was closed in July, 1962.

Another factor which brought the free trader era to a close was the conservation legislation introduced in 1938, which was designed to preserve the game for the exclusive use of the native peoples. No new hunting and trapping licences were to be issued except to Indians and Eskimos, although a British Subject who had held a licence prior to 1938 could continue to do so.[17] Most if not all of the free traders could not survive without also trapping and hunting. With this privilege denied, no more entered the country, and it was then only a matter of time before the white trappers already there either died or retired from the north. Map 7 and Table 5 give some indication of the history of trading activity in the region. It should be

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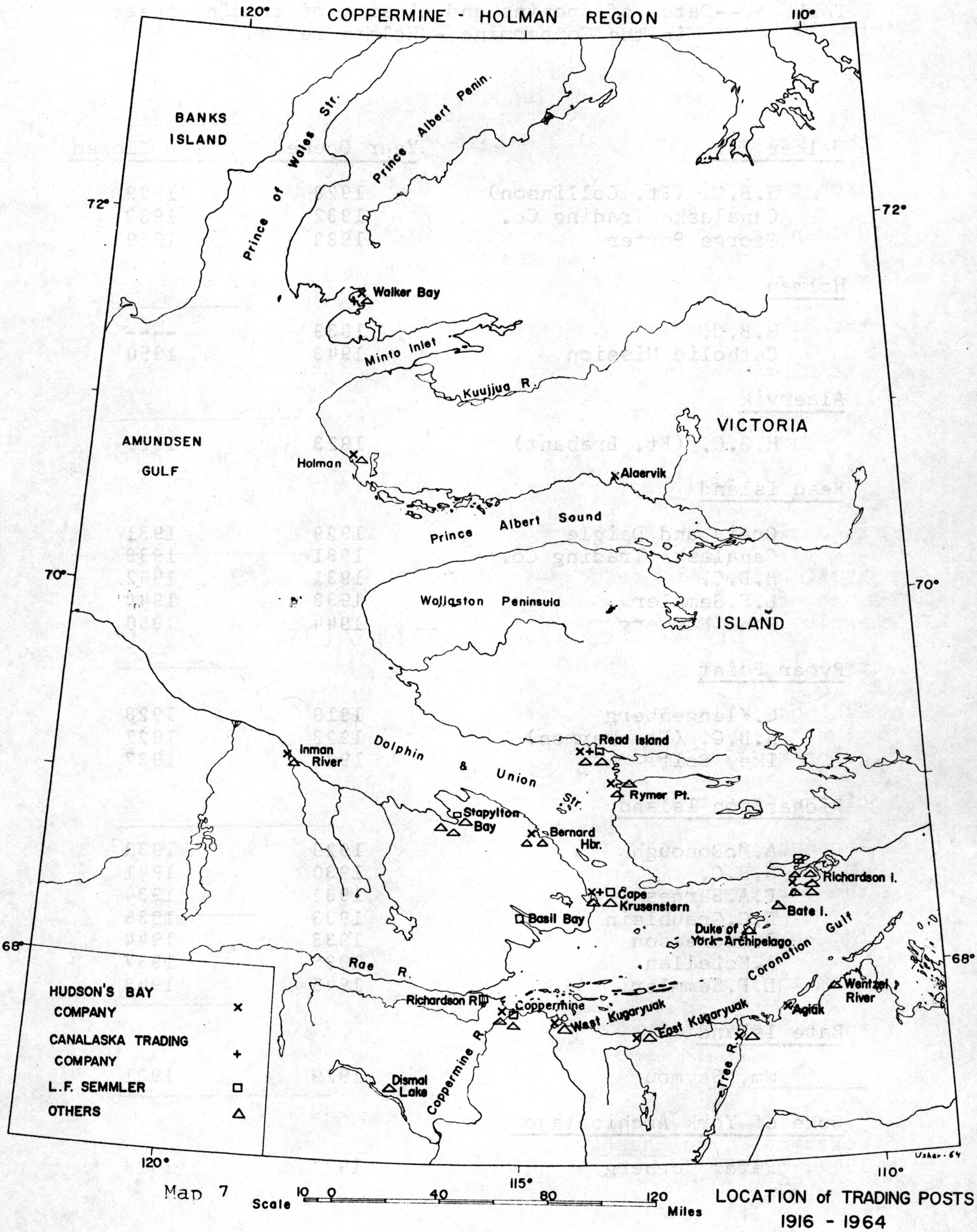
[17] W.J. and J.L.Robinson, "Fur Production in the Northwest", in The New Northwest, ed. C.A.Dawson, Toronto, 1947, p.137.



Map 7

LOCATION of TRADING POSTS
1916 - 1964

TABLE 5.--Dates of opening and closing of trading posts in the Coppermine - Holman region

	Year Opened	Year Closed
Walker Bay		
H.B.C. (Ft. Collinson)	1928	1939
Canalaska Trading Co.	1932	1938
George Porter	1938	1939
Holman		
H.B.C.	1939	----
Catholic Mission	1943	1950
Alaervik		
H.B.C. (Ft. Brabant)	1923	1928
Read Island		
Craig and Daigle	1929	1931
Canalaska Trading Co.	1931	1938
H.B.C.	1931	1962
L.F.Semmler	1938	1948
John Norberg	1944	1950
Rymer Point		
C.Klengenberg	1919	1928
H.B.C. (Ft. Harmon)	1923	1927
Ikey Bolt	1932	1937
Richardson Island		
A.McDonough	1929	1930
H.B.C.	1930	1941
F.A.Barnes	1932	1934
E.C.Graublein	1933	1935
O.Andreason	1933	1944
A.McLellan	1935	1937
L.F.Semmler	1946	1948
Bate Island		
Wm. Seymour	1929	1931
Duke of York Archipelago		
Peter Norberg	1927	1929

TABLE 5.--(cont.)

Wentzel River		
I.Leonard	1935	1937
Agiak		
H.B.C.	1917	1918
Tree River		
Northern Trading Co.	1917	1918
H.B.C.	1918	1929
East Kugaryuak		
Watson, Craig, Purcell and Daigle	1927	1930
H.B.C.	1927	1940
West Kugaryuak		
McIntyre and Morris	1926	1928
H.B.C.	1927	1930
Coppermine		
C.Klengenberg	1916	1923
H.B.C.	1928	----
Catholic Mission	1929	1950
L.F.Semmler	1933	1935
Richardson River		
L.F.Semmler	1935	1938
Dismal Lake		
André l'Heureux	1935	1938
Basil Bay		
L.F.Semmler	1934	1939
Cape Krusenstern		
L.Klengenberg	1926	1936
H.B.C.	1926	1929
Wm.Seymour	1927	1933
Canalaska Trading Co.	1932	1934
L.F.Semmler	1932	1946

TABLE 5.--(cont.)

Bernard Harbour		
H.B.C. (Ft. Bacon, later Ft. Thompson)	1916	1932
Peter Norberg	1932	1932
Stapylton Bay		
Watson, Purcell	1930	1939
L.F.Semmler	1931	1932
Paul Lickert	1935	1938
Wm.Storr	1939	1943
Inman River		
H.B.C.	1926	1932
Brockie and Brackett	1927	1930

Sources:

W.H.B.Hoare, Report of Investigations Affecting Eskimo and Wildlife, District of Mackenzie, 1924-25-26, unpublished mimeo., Dept. Interior, N.W.T. and Yukon Branch, Ottawa, no date.

Record of trading posts, Dept. of Northern Affairs and National Resources, Northern Administration Branch, Territorial Division, Ottawa, Ont.

Current files, Department of Northern Affairs and National Resources, Northern Administration Branch, Ottawa, Ont.

understood that this compilation is only tentative, and should be referred to with caution.

The traders were not the only ones to display an interest in the area. Both the Anglican and Catholic churches were anxious to proselytize among the natives as soon as their existence became known. The initial attempts at mission work have already been mentioned. The Anglican Mission, established at Bernard Harbour in 1916, was moved to Coppermine in 1928.[18] The Oblate fathers, unable to ship materials on the Baychimo that year, took their own boat, Our Lady of Lourdes, from the Mackenzie Delta, but were frozen in at Letty Harbour.[19] The following year, Fr. Fallaise established the mission at Coppermine, but the Anglicans, with a thirteen year advantage, had entrenched themselves in the area, and to this day have a much larger flock than do the Catholics. A second Catholic mission was established at Holman, in 1939, by Fr. Buliard, who had already lived two years with the Eskimos of Minto Inlet.[20]

The murders of Rouviere and LeRoux, and of the

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[18]Personal communication, Archdeacon J.R.Sperry, Anglican Mission, Coppermine, June 1963.

[19]Personal communication, Fr. M.Metayer, O.M.I., Coppermine, June, 1963.

[20]For an account of the establishment of this mission, see R.P.Buliard, Inuk, New York, 1951, pp.128-9.

travellers Radford and Street at Bathurst Inlet in 1912, initiated a drive by the N.W.M.P. to establish "law and order" among the Eskimos. The detachment established at Tree River in 1919 was the third in the entire Western Arctic. The Eskimos of the region had already achieved notoriety for murders, and this was increased by the murdering of Corporal Doak and the H.B.C. trader Otto Binder at Tree River in 1922.[21] The detachment moved to Bernard Harbour in order to licence traders as they entered the region, and in 1932 moved again to Coppermine.

The long term effect of the white man's activity was to concentrate services and ultimately population in a few central places. This was at first unintentional. The traders placed their posts wherever the best opportunities for trade existed, with the reservation that resupply by schooner required in every case a coastal location. These locations tended to be places where the Eskimos traditionally came to the coast in the spring, or well known fishing areas such as the Coppermine River. Indeed it was not in the traders' interest that settlement around the post should take place; far better that the Eskimo keep to his long traplines, away from the post, and come to trade only once or twice a year. However, the permanent post assumed greater

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[21] For an account of this incident see P.H.Godsell, 1934, op.cit., pp.225-39.

importance after 1927 when new regulations came into effect concerning the licencing of posts. Traders were required to have a store of a minimum size, to prevent what was known as "tripping", a practice whereby individual trader-trappers would carry sledloads of trade goods to the Eskimos in mid-winter, and buy fur at very low prices when the Eskimos were not in great need of goods. The rule was made for the protection both of the larger trading concerns and of the Eskimos.[22]

The missionaries to some extent encouraged the Eskimos to live nearby and to worship at church on Sundays, although it must be said that the missionaries who entered the Coronation Gulf area were far more peripatetic than were those of earlier years in the Mackenzie Valley.

Although the Eskimos continued to be nomadic, as they grew more dependent upon the traders and missionaries they changed their seasonal migrations accordingly. Traditional meeting grounds, and the time of the gatherings there, were abandoned, in favour of congregating at the settlements at Christmas and particularly at Easter.

The R.C.M.P. did not present any temptations to the Eskimos to remain in the settlements until 1946, when family allowances were introduced. As were all other Canadians, the

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[22] Current files, Dept. Northern Affairs and National Resources, Northern Administration Branch, Ottawa, Ont.

Eskimos were entitled to receive a monthly stipend for each child, only in their case in the form of a voucher redeemable at the trading post in kind. Already the R.C.M.P. as the sole agency of the federal government in the north, had undertaken to help out destitute individuals, but this was the real beginning of a cash income other than furs for the Eskimos.

Since that time, increasing availability of ready cash, amenities of health and educational facilities, and the depletion of game, have all contributed to attract the Eskimos to the settlements.

Coppermine and Holman are now the only settlements in the region with white populations, but there were many others in the past. Walker Bay preceded Holman as a trading centre, and Read Island was first chosen as a site because in the late 1920s there were strict regulations concerning the establishment of posts within the Arctic Islands Game Preserve. The boundary of the preserve in that area was the coast of Victoria Island, so that by locating at Read, situated only a mile or so offshore, one could circumvent the regulation and still reap the same advantages. Rymer Point was an important site in the 1920s, as was Richardson Island until after World War II. On the mainland, Tree River was an important centre for over a decade until its abandonment in 1929. Further west, Cape Krusenstern, Bernard Harbour, and Stapylton Bay were the major active trading centres.

Changes in the Eskimo Economy

The arrival of the traders affected the Eskimo way of life more profoundly than did that of any other group of people who came into the region after 1916. They came in search of furs, particularly the fur of the white fox, which the Eskimo had hardly used hitherto. The traders supplied the Eskimos with steel traps, and offered them rifles, knives, cloth, tobacco and other sundries in exchange for their furs. The Eskimos were most happy to trade fox pelts, so valueless in their eyes, for the marvelous goods of the traders. To do this, however, they had to pay attention to their traplines all winter, which left them little time to hunt for seals, their main food source during that season. This problem was compounded by the fact that the average dog team increased in size with the introduction of fur trapping. Fifty years ago a family might have owned three dogs; the wealthiest man might have owned six.[23] Six dogs per family is now practically the minimum, because to cover long distances in a short time, as one must when trapping, more dogs are required. The Eskimo, then, had a greater food requirement and less time in which to obtain it.

This development was counteracted in a variety of ways. Two new methods of foodgathering were introduced: the rifle and the fishnet. The former allowed the Eskimo to kill

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[23] Diamond Jenness, 1922, op.cit., p.118.

far more caribou than had even been possible over the same period of time with bows and spears; the latter likewise immeasurably increased his fish catches. In addition, the Eskimo developed a taste for tea, tobacco, flour, sugar, and even bully-beef, and these items augmented his diet. Only a short time was required for the Eskimo to become completely dependent upon the wares of the trader.

The relationship of the Eskimo to the trader became virtually that of a bonded servant. To trap initially, the Eskimo had to be supplied with traps, and generally a rifle and other gear. Having no means to pay for this outfit, he went in "debt" to the trader, and settled his account the following spring by bringing in his catch of furs. Both the availability of the white fox and its market price fluctuated considerably, and in some years the Eskimo was unable to pay off his debts. This indebtedness to the trader prevailed for almost thirty years, until other sources of cash income became available to the Eskimos.

During this period, the availability of game, particularly of caribou, declined; a process which will be discussed more fully in another chapter. The failure of the caribou migrations meant not only a lack of food but of skins for clothing, thus increasing the Eskimos need for cloth, which could only be obtained from the traders.

Certainly great profits could be made by a trader in good seasons, especially during the early years when the

Eskimos had no concept of the value of money, or of the care required for the proper maintenance of the white man's implements. Godsell wrote that

> "From the very first the rifle had proved the best seller, But at last each Eskimo had one and the trade had reached the saturation point, a fact deplored by all. It was Captain Klinkenberg who rose to the occasion in a characteristic manner by importing hard steel ramrods, giving them to the natives and telling them to scrape the inside of their rifle barrels freely to take the powder out. This, of course, soon ruined the rifling so that the guns would not shoot straight, and the erstwhile trade in rifles was resumed."[24]

The story may be apocryphal, and the reference to Klengenberg unfounded, although it does not seem out of keeping with the man. It is, however, a good indication of the nature of the fur trade in the early days, when the Eskimos were being "robbed blind" by the traders. In 1923, when a white fox brought $40 in London, the price of a $25 Winchester rifle was, for the Copper Eskimos, twenty pelts.[25] In a decade the Eskimos had become utterly dependent upon the fur trade and the traders, and so the situation remained through the first half of this century.

A New Way of Life (1950 to the present)

Beginning in about 1946 there was a general review by the federal government of its policies and responsibilities

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[24] P.H.Godsell, 1934, op.cit., p.273.

[25] P.H.Godsell, Red Hunters of the Snows, Toronto, 1938, p.281.

in the north.[26] This coincided with a period of increased economic hardships for the Eskimos, resulting from the post-war decline in white fox fur prices. The increased government activity in the north which resulted began to affect the Coppermine - Holman region in about 1950; hence the choice of this year as the beginning of a new era.

Health and education, which had been left in the hands of the missions, became the responsibility of the federal government. A nursing station was established at Coppermine in 1948, so that, coupled with an annual X-ray survey and the opening of the Charles Camsell Hospital for Indians and Eskimos in Edmonton, the dread epidemics of tubercolosis were for the first time being properly combatted. A two room school was built at Coppermine in 1950, bringing educational facilities to the area. This has had important consequences, which will be elaborated on in Chapter IV.

The commencement of DEW line construction in 1955 brought with it opportunities for wage labour, of which many Eskimos availed themselves. In this same year, the recently created Department of Northern Affairs and National Resources

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[26] For an account of the changes in government policy on the north, between 1946 and 1950, see Diamond Jenness, Eskimo Administration: II. Canada, Arctic Institute of North America, Technical Paper No. 14, Montreal, 1964, pp.78-89.

appointed six Northern Service Officers "... to coordinate field activities and to supervise developments in various areas."[27] In ensuing years, more field administrators were stationed in the north, and the Coppermine - Holman region became a separate administrative unit in 1959.

This increase in government activity has had two important effects. The opening of permanent wage positions and the availability of seasonal construction work (which naturally accompanied the expansion of facilities), has shifted the emphasis from a trapping economy to a wage labour economy. Secondly, the knowledge that medical care and relief payments had become available when needed, influenced many families to reside permanently in the major settlements.

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[27] Canada, Department of Northern Affairs and National Resources, Annual Report, 1955-56, Ottawa, 1957, p.25.

CHAPTER III

THE POPULATION OF THE REGION

Any analysis of the adequacy of a resource base must take into account the number of people the resource base is or could be supporting. To make such an analysis for the past, former population levels must be known, and likewise, to comment on the future, one must know the growth rate and other trends of population characteristics. In this chapter it is proposed to discuss both past and present population patterns, and to analyse and compare available data in order to predict future trends.

Fluctuations and Movement During the Twentieth Century

Both Jenness, in 1914,[1] and Rasmussen, in 1924[2] estimated that the western Copper Eskimos numbered between 400 and 450 individuals, and that just over half of them lived on Victoria Island. The population was comprised of approximately a half-dozen groups, which had distinctive

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[1]Diamond Jenness, 1922, op.cit., p.42

[2]Knud Rasmussen, Intellectual Culture of the Copper Eskimos, Report of the Fifth Thule Expedition, 1921-24, Vol. 9, Copenhagen, 1932, p.70.

names according to the location of their hunting grounds. An individual was not bound to a group by any custom or law, but could move where he wished. For instance, a Noahognirmiut, living near Bernard Harbour, might decide to go and live with a relation in the Read Island area. He would then become a Puivlirmiut, as the people who lived in that area were called. As population movement changed with the arrival of the whiteman, so these names fell into disuse, although older people still remember to which groups they belonged. Jenness cites evidence that the population may have declined slightly during the fifty years prior to his arrival.[3] It would be very difficult to arrive at any accurate population estimates for the entire region prior to the twentieth century. There are isolated observations by explorers, none of whom saw the entire area at one time, and Eskimo recollections of famines and disasters, from which rough estimates could be made. In the absence of evidence to the contrary, it may be presumed that the Eskimo population of the region before contact was as great as the existing resources and technology allowed.

The Eskimo population appears to have remained stable between 1914 and 1924, after which there is evidence that it decreased sharply. This decline was caused mainly

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[3] Diamond Jenness, 1922, op.cit., pp.39-42.

by communicable diseases brought in by the white man, and references to epidemics in the late 1920s and early 1930s are many in the books and records of the time, although specific numbers of cases or fatalities were seldom mentioned.

Reliable census data are sparse until 1956. Enumeration was difficult amoung the nomadic people, and births sometimes went unregistered for months or even years. Regional totals may be found in several government publications between 1920 and 1950, but there is no indication of the boundaries of these regions, or the distribution within the region, or how the enumeration was conducted. An exception is an R.C.M.P. count in 1942, listing the number of people at several camps.[4] According to this estimate, there were 316 Eskimos in the region at that time. The D.B.S. census of 1956, which appears to have been the first to be based on careful enumeration of all people in the region, showed 436 Eskimos.

Most likely the actual nadir in population came in the early 1930s, from which a recovery was already being made by 1942. Indications are that a full return to the pre-contact population level was not made until the

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[4]Current Files, Department of Northern Affairs and National Resources, Northern Administration Branch, Ottawa, Ont.

mid-1950s.

The general trend of movement from the camps to the larger settlements has already been noted. There have been no significant migrations into or out of the Copper Eskimo Region within recollected time. Table 6 indicates the origins of the present population of the region.

The table is of limited value due to the high proportion of individuals whose birthplaces were recorded simply as "N.W.T.". Many such individuals at Coppermine stated, when questioned, that they were born simply "inland", which may be taken to mean anywhere between Bathurst Inlet and the Coppermine River. It would be reasonable to allocate well over half of the "unspecifieds" at Coppermine to the inland areas, and the remainder more or less evenly along both shores of Coronation Gulf and Dolphin and Union Strait. At Holman, most of the "unspecifieds" were probably born in north-western Victoria Island.

The major exodus within the region has taken place from the inland areas. Within the last five years, about four Coppermine families have moved west to Darnley Bay, a region occupied from time to time by the Parry Peninsula Eskimos. In the summer of 1962 these four families were almost the only ones exploiting the resources available at the mouth of the Hornaday River. As they trade into the Cape Parry store, they are no longer a part of the Copper-

TABLE 6.--Birthplace of individuals residing in the Coppermine and Holman trading areas during 1962-63, over the age of ten years as of January 1, 1963.

Place	Coppermine Trading area	Holman Trading area	Total
N.W.T.(unspecified)	52	25	77
Coppermine	56		56
Holman		28	28
Read Island	19	5	24
N.W.Victoria Island (north of Cape Baring)	12	27	39
S.W.Victoria Island (south of Cape Baring)	18		18
Mainland coast between Inman and Coppermine Rivers	18		18
Mainland coast between Coppermine and Tree Rivers	22		22
Inland, between Coppermine River and Contwoyto Lake	13		13
Bathurst Inlet	13		13
Cambridge Bay, Kent Penin. and points east	7		7
Darnley Bay and points west, inc. Alaska	8		8
Edmonton	1		1

[a]Source: Eskimo Identification Lists, W2 (Coppermine) and W1 (Cambridge Bay), 1957.

mine economy.

The great majority, then, of the people presently in the region are of Copper Eskimo stock. However, many of today's family heads are the progeny of white fathers and Eskimo mothers, as such unions were common during the free trader era of the 1920s and '30s.

The white population grew rapidly in the early 1930s, during the free trader period, and may have reached 100 persons. A low point was reached a decade later, after most of the posts had closed, and the requirements of the war had reduced government personnel to a minimum. There were 42 white people in the region on July 1, 1963, not including DEW line personnel.

Vital Statistics, and Present Distribution of the Population

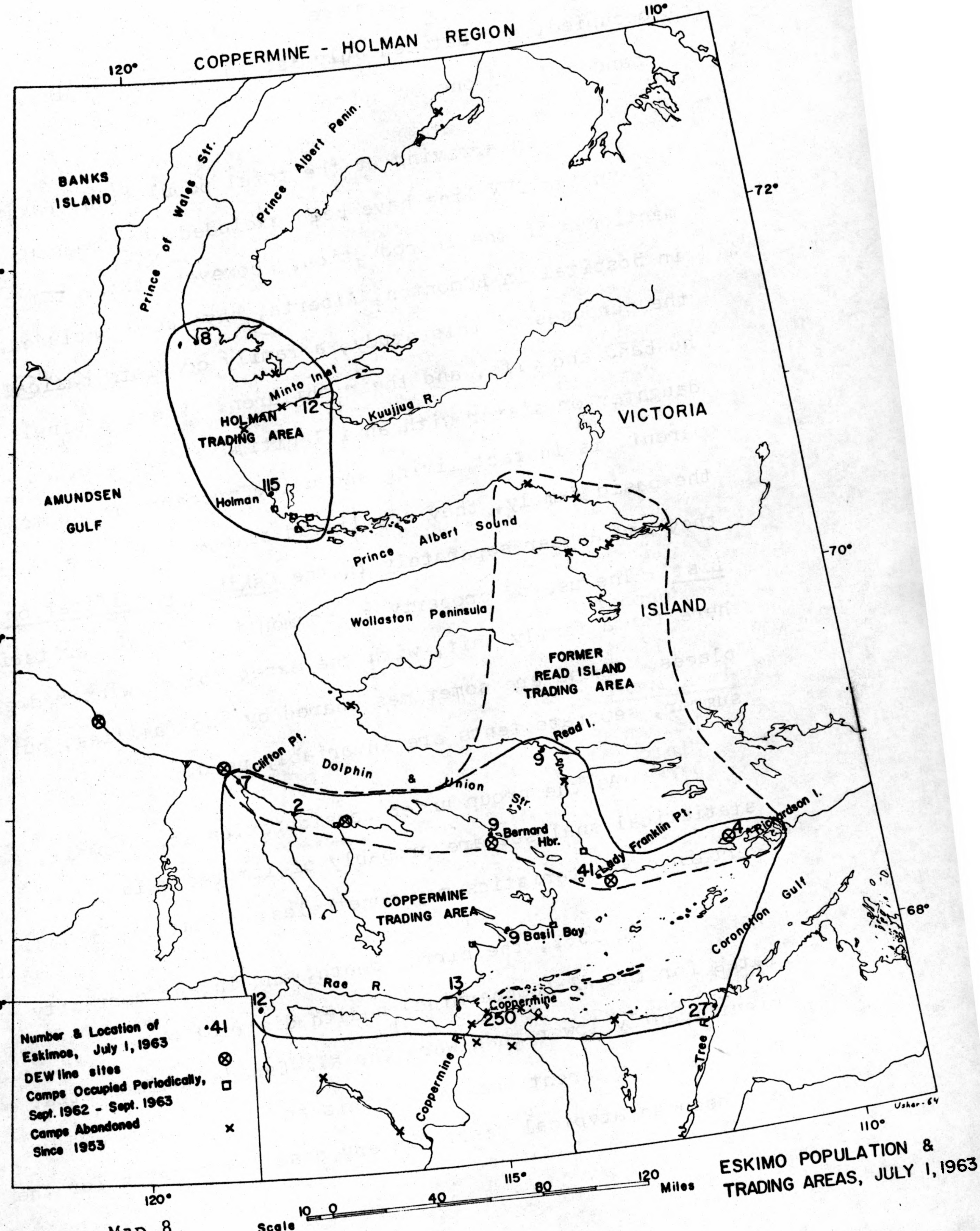
All data used in this section, unless otherwise noted, was obtained from the W2 (Coppermine) Eskimo Identification List, and from interviews in the region. Identification lists are compiled annually for every health district in the Arctic by the R.C.M.P.

The reference point used in this discussion is July 1st, 1963. It should be understood that many families move their camps seasonally, and therefore Table 7 and Map 8 are no more than records of where people were living at that specific date. In fact, between January 1st and July 1st,

TABLE 7.--Location of Population, July 1, 1963

Location.	no. of individuals[a]	no. of families
Coppermine Trading Area		
Coppermine	250	51
Lady Franklin Point	41	7
Tree River mouth	27	5
Rae River mouth	13	4
Upper Rae River	12	2
Read Island	9	2
Bernard Harbour	9	2
Basil Bay	9	1
Clifton Point	7	1
Richardson Island	4	1
Hoppner River	2	1
	383	77
Holman Trading Area		
Holman	115	20
Minto Inlet	12	2
Berkeley Point	8	1
	135	23
	518	100

[a]The above population data include minor corrections made since the publication by Abrahamson et.al., 1964, op.cit., and are to be considered accurate. The information has been compiled from the Eskimo Identification Lists, District W2, for 1963 and 1964, and from personal knowledge.


COPPERMINE - HOLMAN REGION
120°
110°
72°
70°
68°
BANKS ISLAND
Prince of Wales Str.
Prince Albert Penin.
Minto Inlet
HOLMAN TRADING AREA
Kuujjua R.
VICTORIA
ISLAND
AMUNDSEN GULF
Holman
Prince Albert Sound
Wollaston Peninsula
FORMER READ ISLAND TRADING AREA
Read I.
Clifton Pt.
Dolphin & Union Str.
Bernard Hbr.
Lady Franklin Pt.
Richardson I.
COPPERMINE TRADING AREA
Basil Bay
Coronation Gulf
Rae R.
Coppermine
Coppermine R.
Tree R.
8
12
115
7
2
9
9
41
4
9
13
12
250
27
Number & Location of Eskimos, July 1, 1963 •41
DEW line sites
Camps Occupied Periodically, Sept. 1962 - Sept. 1963
Camps Abandoned Since 1953
Usher - 64
115°
Scale 10 0 40 80 120 Miles
ESKIMO POPULATION & TRADING AREAS, JULY 1, 1963

Map 8

1963, three campsites were abandoned and four new ones were occupied, and between July 1st and September 1st, two were abandoned and one occupied.

In arriving at the total population, Eskimos working on the DEW line have been excluded, for reasons mentioned in the Introduction. However, those temporarily in hospital in Edmonton, Alberta, have been included. For the purposes of this study, a family consists basically of husband and wife, and their children. Where a single daughter or sister with an illegitimate child, or an aged parent, is in fact living and using property in common with the basic family, they are listed as one family, although they may appear separately in the Eskimo Identification List. The use of property in common is the main criterion here for a family unit, with the exception of winter dwelling places. These are sometimes shared by two families, but in summer, separate tents are invariably used.

As the group under consideration is so small, statistical analyses are probably of limited value, but certain characteristics may nonetheless be distinguished.

In 1962, the birth, death, and infant mortality rates for the W2 (Coppermine) health district were significantly lower than were the all-Canada Eskimo rates. There is no apparent reason for this and 1962 may possibly have been an atypical year. In any case these rates for the

TABLE 8.--Vital Statistics

Birthrate per 1000 population[a]

1962	W2 (Coppermine) Eskimo[b]	45
1962	All Canada Eskimo	61
1961	All Canada	26

Deathrate per 1000 population[a]

1962	W2 (Coppermine) Eskimo	15
1962	All Canada Eskimo	23
1961	All Canada	8

Natural Increase per 1000 Population[a]

1962	W2 (Coppermine) Eskimo	30
1962	All Canada Eskimo	38
1961	All Canada	18

Infant Mortality per 1000 live births[a]

1962	W2 (Coppermine) Eskimo	83
1962	All Canada Eskimo	194
1961	All Canada	27

Sex, July 1, 1963

	Males	Females	Males per 100 Females
Coppermine	121	129	94.6
Coppermine camps	68	65	104.6
Holman and camps	60	75	80.0
Coppermine - Holman Region	249	269	92.6
All Canada (1961)			102.2

Available Labour Force (Males age 17-60), July 1, 1963

	Number	Ave. no. of dependents
Coppermine	54	4.65
Coppermine camps	37	3.59
Holman and camps	30	4.50
Coppermine - Holman Region	121	4.28
All Canada (1961)		3.77

Children of School Age (6-16), July 1, 1963

	Male	Female	Total	% of Total Pop.
Coppermine and Trading Area	48	57	105	27.4
Holman and Trading Area	13	29	42	31.1
Coppermine - Holman Region	61	86	147	28.4
All Canada (1961)				22.6

[a]Source: Northwest Territories Council, Sessional Paper no. 7, 1963, 2nd Session.

[b]W2 Health District includes Contwoyto Lake and had a population of 535 Eskimos in 1962.

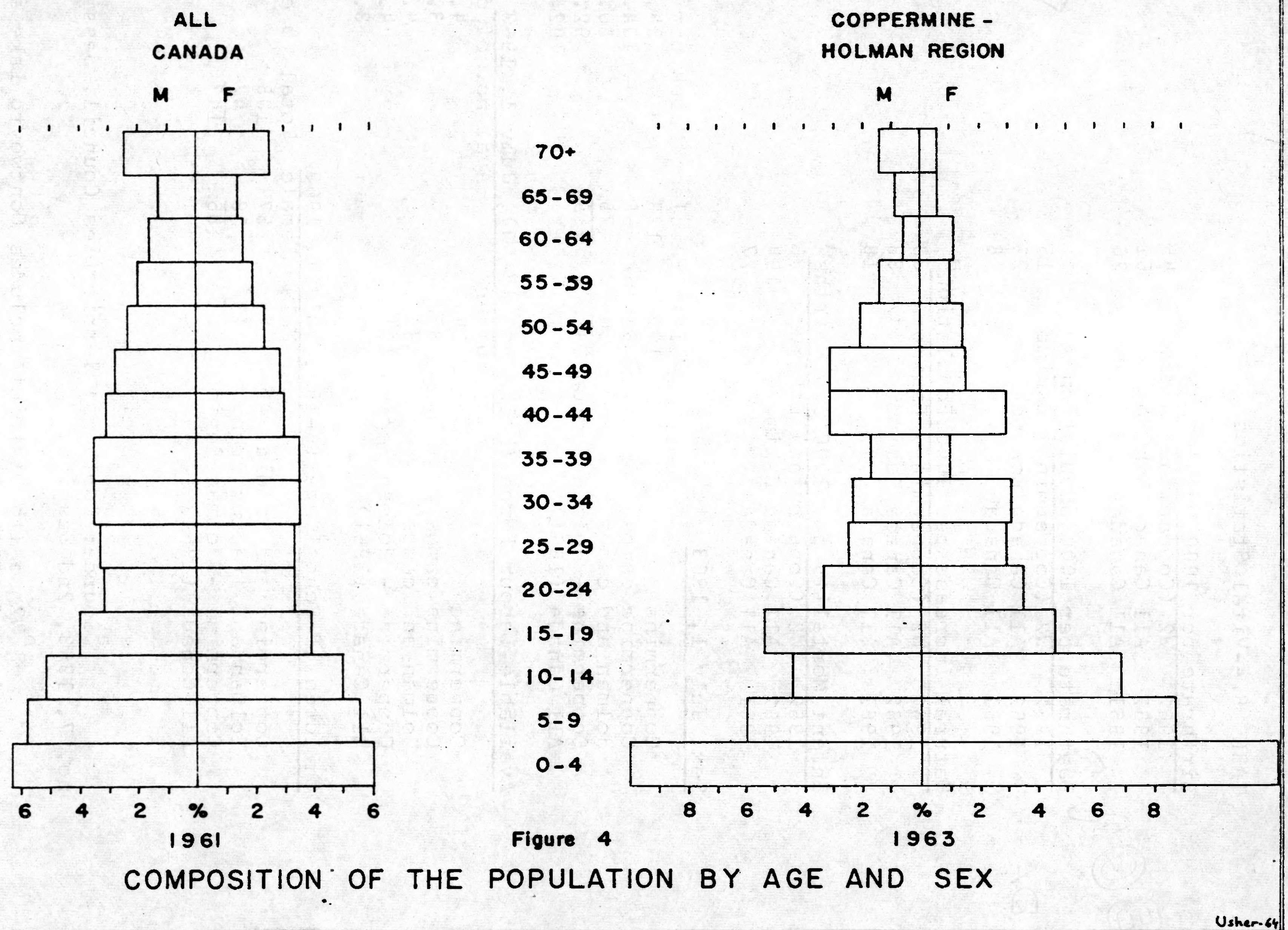


Figure 4

COMPOSITION OF THE POPULATION BY AGE AND SEX

W2 district are far higher than the Canadian average. The birthrate, and the rate of natural increase, are among the highest in the world, and the similarity of the situation to that of the underdeveloped nations is no accident. Both have experienced in recent years a revolution in medical care. Infant mortality has been reduced, and life expectancy has been increased, while notions of birth control remain totally non-existent. The population pyramid shows an unusually disproportionate number of young people. 52.7% of the people are sixteen years of age or under, as opposed to 37.3% for all of Canada. Curiously enough, there are almost three females for every two males in this age group. No explanation is apparent for this, but this recent trend has more than redressed the former imbalance in which males predominated. In the age groups above 35 years, this former pattern may still be seen. Infanticide was practised in the region until the 1920s. If children were born during a famine or migration, they were often killed at birth because there were no means of coping with them at that time. This was particularly true in the case of girls, as they would not grow up to be providers of food for the community.

There are clearly some important consequences of the above-mentioned population increase and of the imbalance of males and females. The average man in the Coppermine - Holman region has more people dependent upon his labour than does his counterpart in southern Canada, and there is a considerably higher proportion of school age children in the region than there are nationally. In short, there are more people requiring goods and services and less people able to provide them, and this in a region of marginal resources.

There is no reason to expect the very high birthrate now characteristic of the study region to diminish in the near future. Indeed, so long as infant mortality continues to be reduced, and the people remain ignorant of birth control methods, the birthrate may even increase. It may seem paradoxical that over-population could occur in an area where there is less than one person per hundred square miles, but in view of the very limited resource base of the region, that is exactly what is happening. This development cannot but augur ill for the people of Coppermine and Holman unless they can find significant new sources of revenue.

CHAPTER IV

THE SETTLEMENTS

We have already noted a trend toward settlement living on the part of the Eskimos. In July 1963, over seventy percent of all Eskimos in the region lived in the two main settlements: Coppermine and Holman. It is therefore of interest to note the physical attributes of these two places. In this chapter, aspects of site, water supply and sewage at both Coppermine and Holman are discussed. Information concerning power, fuel storage, and food storage may be found in Abrahamson et. al., 1964, op.cit., and need not be repeated here, as it is not of direct interest. It is also proposed to discuss such environmental aspects of the communities as housing and home heating, and two services available in the communities which have had an important effect on the lives and earning power of the Eskimos: health and education. It is not proposed to suggest solutions to the problems discussed in this chapter, for that is the prerogative of engineers, doctors, and educators. Rather, the purpose is to relate conditions as they now exist, and to examine their effects.

Coppermine

Site and building considerations

Just west of the mouth of the Coppermine River, a basalt ridge about four miles long rises from the sea, ending in a steep scarp slope facing south across the river flats. Coppermine (67°49'N, 115°05'W) lies on the north-facing dip slope of this ridge, overlooking Coronation Gulf. Map 9 shows the settlement in detail, while Map 10 shows its environs.

The foreshore consists of sandy material, and falls off quite steeply toward the water from between the five and ten foot contour lines. The bare rock surface of the basalt dip slope begins at about the twenty-five foot contour line. Between the shore and the rock outcrop there is a gently rising, poorly drained area of silts which may have been a lagoon at one time.

The settlement (as is the entire study area) is underlain by permafrost. In the silty soil between the beach and the rock outcrop, the active layer ranges in depth from twelve to thirty-six inches.[1] In the sandy area at the water front, the active layer is on the whole deeper. In August 1963, a sewage pit was dug there, and no frost was noted at a depth of four feet.

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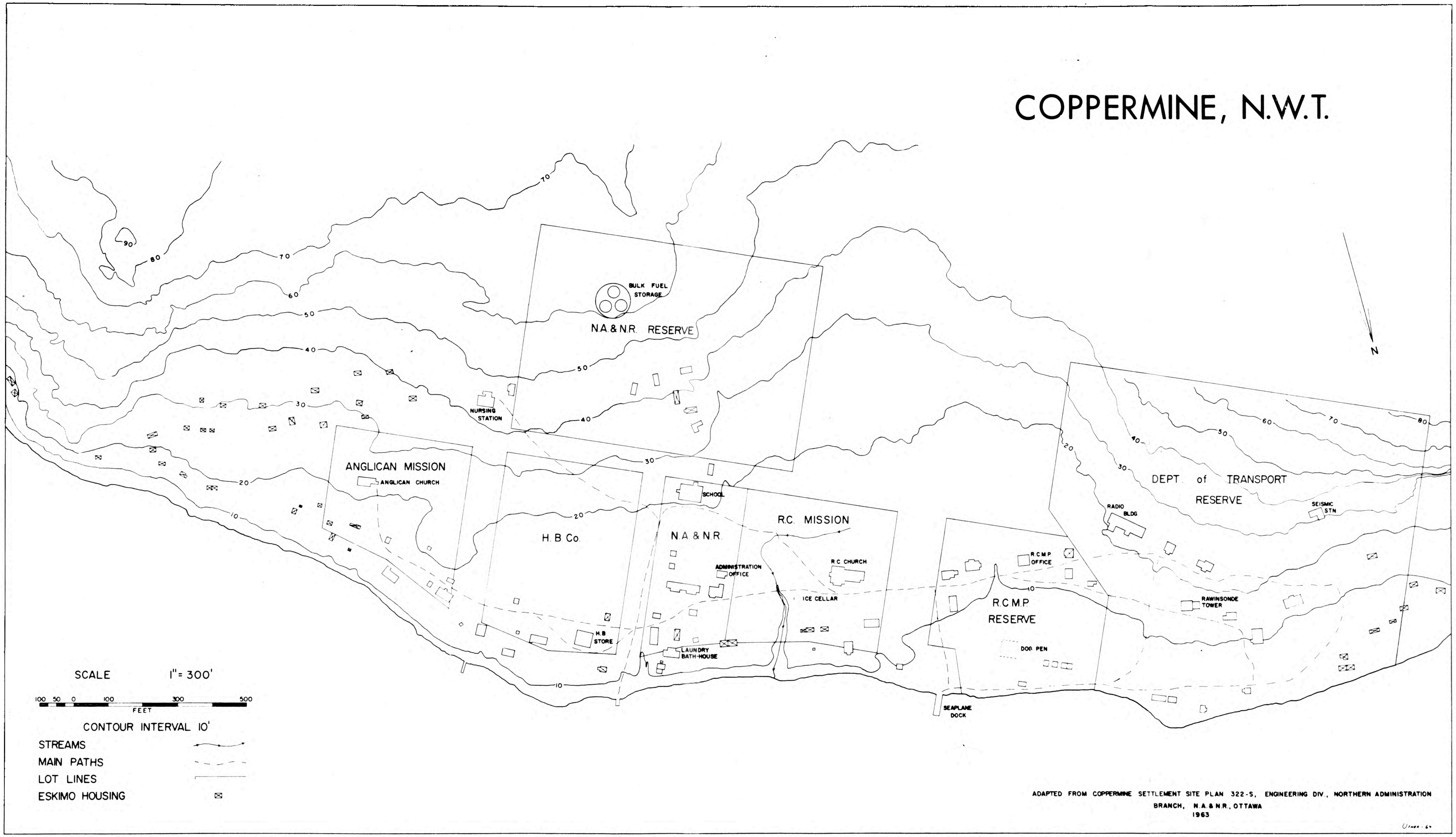
[1] R.T.Gajda, Terrain and Site Analysis, Coppermine, N.W.T.,MS, Dept. Mines and Technical Surveys, Geographical Branch, Ottawa, 1962, p. 9.


COPPERMINE, N.W.T.
BULK FUEL STORAGE
NA & NR RESERVE
NURSING STATION
ANGLICAN MISSION
ANGLICAN CHURCH
H. B. Co.
H.B. STORE
SCHOOL
N.A & N.R.
ADMINISTRATION OFFICE
LAUNDRY BATH-HOUSE
R.C. MISSION
R.C. CHURCH
ICE CELLAR
R.C.M.P. OFFICE
R.C.M.P. RESERVE
DOG PEN
SEAPLANE DOCK
DEPT. of TRANSPORT RESERVE
RADIO BLDG
SEISMIC STN
RAWINSONDE TOWER
N
SCALE 1" = 300'
100 50 0 100 300 500
FEET
CONTOUR INTERVAL 10'
STREAMS
MAIN PATHS
LOT LINES
ESKIMO HOUSING
ADAPTED FROM COPPERMINE SETTLEMENT SITE PLAN 322-S, ENGINEERING DIV., NORTHERN ADMINISTRATION BRANCH, N.A.& N.R., OTTAWA
1963

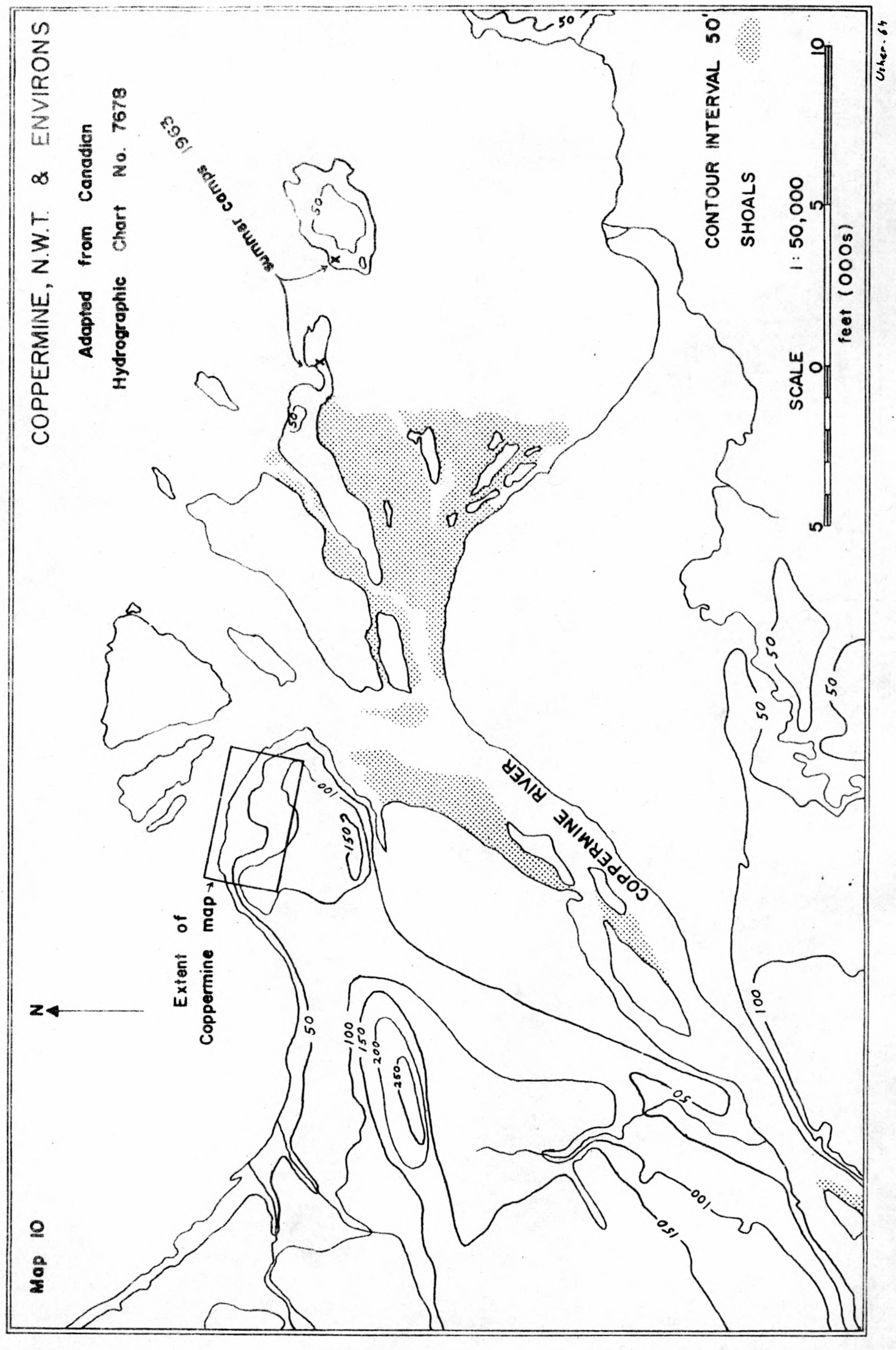

Map 10
COPPERMINE, N.W.T. & ENVIRONS
Adapted from Canadian
Hydrographic Chart No. 7678
summer camps 1963
N
Extent of
Coppermine map
COPPERMINE RIVER
CONTOUR INTERVAL 50'
SHOALS
SCALE 1:50,000
5 0 5 10
feet (000s)
50
100
150
200
250
Usher. 64

Plate 1

View of Coppermine from west, early June, 1963.

Buildings of the D.O.T. complex are in the centre ground. Catholic Mission buildings may be seen in the right background. The Coppermine River enters from the right, and open water may be seen near the shore at right; otherwise the sea is still frozen. Deltaic sandbars and islands form the dark strip across the rearground of the picture.

Plate 2

Eskimo Housing at Coppermine, early June, 1963

Most Eskimos live in the east end of Coppermine. The housing in this picture, some of plywood and some of canvas, is typical of the settlement. Trash is being burnt in the centre ground.

There are definite limitations to the expansion of the settlement at the present site. To the east and west lie rough, rocky areas unsuitable for construction, and the ridge crest to the south is rocky and exposed.

The settlement is built almost entirely on the silt area above the beach; the only unused portion of any extent being the swamp directly south of the Catholic Mission and R.C.M.P. buildings. In spring the ground is everywhere very wet, and the settlement is dotted with puddles and rills, the worst area being to the east of the Anglican Mission where most of the Eskimo homes are.

Government and private agencies are generally located on the choicest building grounds. This seems due not to any malice on their part but to the fact that they erected buildings there before the Eskimos did, and indeed did not at first expect the growth of a large Eskimo community. The fact remains, however, that most Eskimo homes are on sites which are undesirable for reasons already mentioned. The recent erection of housing on higher ground southeast of the nursing station is an improvement, but building space there is limited.

Although present engineering plans show neat lot lines representing the areas leased to the various government and private agencies, the location of buildings appears to have been made largely without reference to any plan. Agencies are free to erect buildings as they choose on their own lots, while the Eskimos build wherever they see fit. There has been no co-ordinated "town plan" to guide and control the growth and physical appearance of the settlement. The legacy of the policy of assigning large tracts of land to government or private agencies in the 1930s has been that the Eskimos have no title to the land on which they live. They are in fact "squatters", and can be evicted by the lessee if their houses are on assigned land, or by the Crown if their houses are elsewhere. Evictions are, of course, most unusual, but the Eskimo has in fact no legal recourse against them.

The arrival of new pre-fabricated Eskimo housing makes the present a most opportune time for the federal government to give some thought to the future pattern of settlement in Coppermine. Admittedly, any major re-arrangement of existing buildings would be a large and perhaps unthinkable investment at this time, but ideally the settlement should be much more compact. The advantages of compactness are obvious in such a cold climate, and a less wasteful use of space could allow many more buildings to be erected without an enlargement of the site. The Eskimos themselves are gregarious and fond of visiting each other's houses, and in general prefer to live close together.

Water Supply and Dewage.

There is no settlement-wide water supply system, nor is there any organized means of garbage collection and disposal. Water is obtained from the river or from runoff streams in summer, and from river ice in winter. Eskimo families obtain their own water on an individual basis, storing it in odd cans and pails in the home. Most of the government agencies and other organizations hire local labour, on a full-time basis where needs are great enough, to haul water and ice. Water is brought from the river in drums by boat to the waterfront, and from there is pumped to the various buildings through individual hoselines. Each building has its own pressure or gravity tank. Ice blocks are hauled by dogteam or mechanized transport. The water supply is not pre-treated in any way and so needs to be boiled before use. That many Eskimos do not do so is probably responsible for occasional outbreaks of hepatitis and diarrhoea.

It is very difficult for an Eskimo to obtain sufficient water to allow his family to bathe themselves, and wash their dishes and clothes, with the frequency taken for granted in southern Canada. An inordinate amount of time would have to be spent hauling water and ice. Fuel is an expensive commodity, and the average family has difficulty enough in obtaining sufficient fuel to heat their homes in winter, without having to melt large quantities of ice. To obviate this problem, the Dept. of Northern Affairs erected a community bath-house and laundry in 1962 (this had not opened for use by the summer of 1963 because the replacement order for a broken pump had not yet been fulfilled). It is equipped with bathtubs, chemical toilets, and washing machines, which may be used free of charge by the Eskimos. Future plans include the installation of clothes dryers.

There still remains a need for a more convenient supply of water for home use. Possible solutions to this problem include a large heated tank, or a water truck. The existence of permafrost clearly precludes the sinking of wells, or the installation of underground water conduits.

Very few Eskimo homes have toilet facilities. Those Eskimos, and whites, whose homes do have them, dump sewage out on the ice in drums to the west of the settlement, where it can be carried away at breakup. This must be done well away from the settlement; dumping near the sandbars is discouraged as the water there is shallow, and refuse may either be washed up on shore or be caught in the many fishnets which are set there in summer. During the summer, sewage is either dumped in the sea or into covered pits. These pits are covered over when finished, and probably refreeze in time as they are for the most part below the permafrost level. Used water is either dumped on the ground near the houses, or is allowed to run out in open drainage ditches to the sea. Garbage is burned in incinerators made from fuel drums.

In winter most of the Eskimos dump refuse and sewage just outside their homes, with the result that the spring thaw uncovers an appalling mess. However, shortly after the people have moved into their summer tents, a general clean-up takes place and appearance of the community is much improved.

Disposal of garbage in any Arctic community is a problem. Permafrost prevents the installation of septic tanks, and indeed in some places the soil is not deep enough for them.

Pre-fabricated houses with chemical toilets are now available to the Eskimos, and may be introduced on a large scale in coming years. The use of proper receptacles for waste will ease the disposal of it, so that all waste in the settlement can either be placed on the ice in winter or in pits in the summer.

Holman

Site and Building Considerations

Holman (70°44'N, 117°45'W) lies on the east shore of King's Bay, a small inlet of Amundsen Gulf on the western side of Victoria Island. This point also marks the western edge of the basalt scarp region. At the settlement, the land rises steeply from the shore, with a slope of about one in four. To the south lies a rock knob of about 150 feet high. At the back of the settlement, to the east, is a small pond about 1000 feet in length. Behind this pond a precipitous basalt face rises to about 700 feet above sea level. Map 11 is a detailed plan of the settlement, and the surrounding area is shown on Map 12.

The settlement has two focal points, separated by a small ridge projecting toward the bay. One is the Catholic Mission next to the creek draining the water lake, and the other is the Hudson's Bay Co. compound. Eskimos live at various points in the settlement, but the greatest concentration of homes is at the north end. There is a small, narrow beach at the foot of the H.B.C. compound.

The present built up area is well drained and there are many outcrops of bare rock. The area is entirely underlain by permafrost, with the active layer ranging from two to three feet in depth. Permafrost is not a problem in the vicinity of the settlement as in most areas the soil is not by its nature subject to frost heaving.[2]

The present site, although picturesque, has many disadvantages. The natural limits outlined above restrict much further expansion of the settlement. The rough topography also precludes the provision of water, fuel or sewage lines, and of roads. The steep slopes

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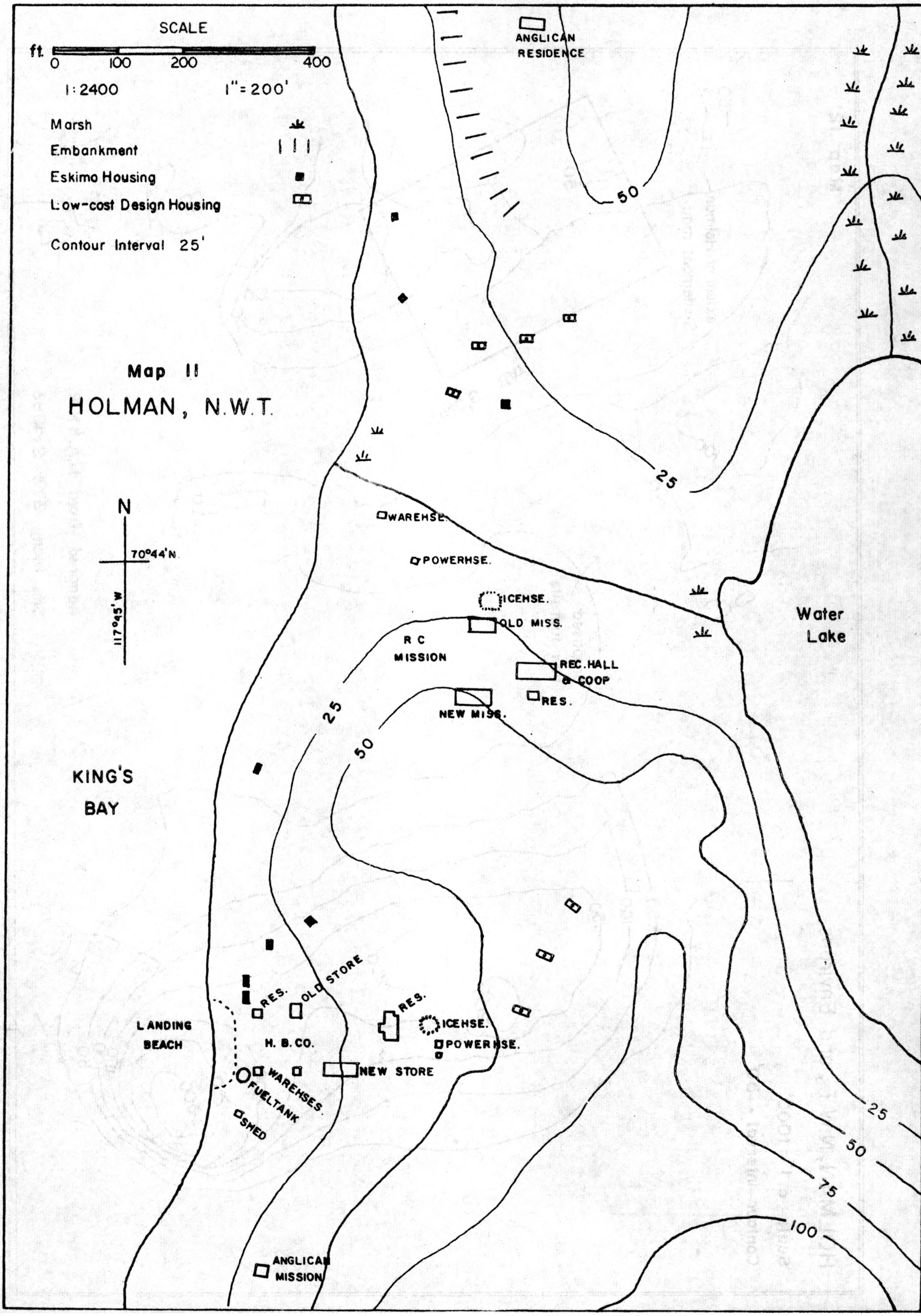
[2]Haddin, Davis and Brown Co., Ltd., Report on Holman Settlement, N.W.T., Project no. 8257, for Northern Administration Branch, Department of Northern Affairs and National Resources, Edmonton, 1963, p.19.


SCALE
ft. 0 100 200 400
1:2400
1" = 200'
Marsh
Embankment
Eskimo Housing
Low-cost Design Housing
Contour Interval 25'
Map II
HOLMAN, N.W.T.
N
70°44'N.
117°45'W
KING'S
BAY
ANGLICAN
RESIDENCE
50
25
WAREHSE.
POWERHSE.
ICEHSE.
OLD MISS.
R C
MISSION
REC. HALL
& COOP
RES.
NEW MISS.
Water
Lake
25
50
OLD STORE
RES.
RES.
ICEHSE.
POWERHSE.
LANDING
BEACH
H. B. CO.
NEW STORE
WAREHSES.
FUELTANK
SHED
25
50
75
100
ANGLICAN
MISSION

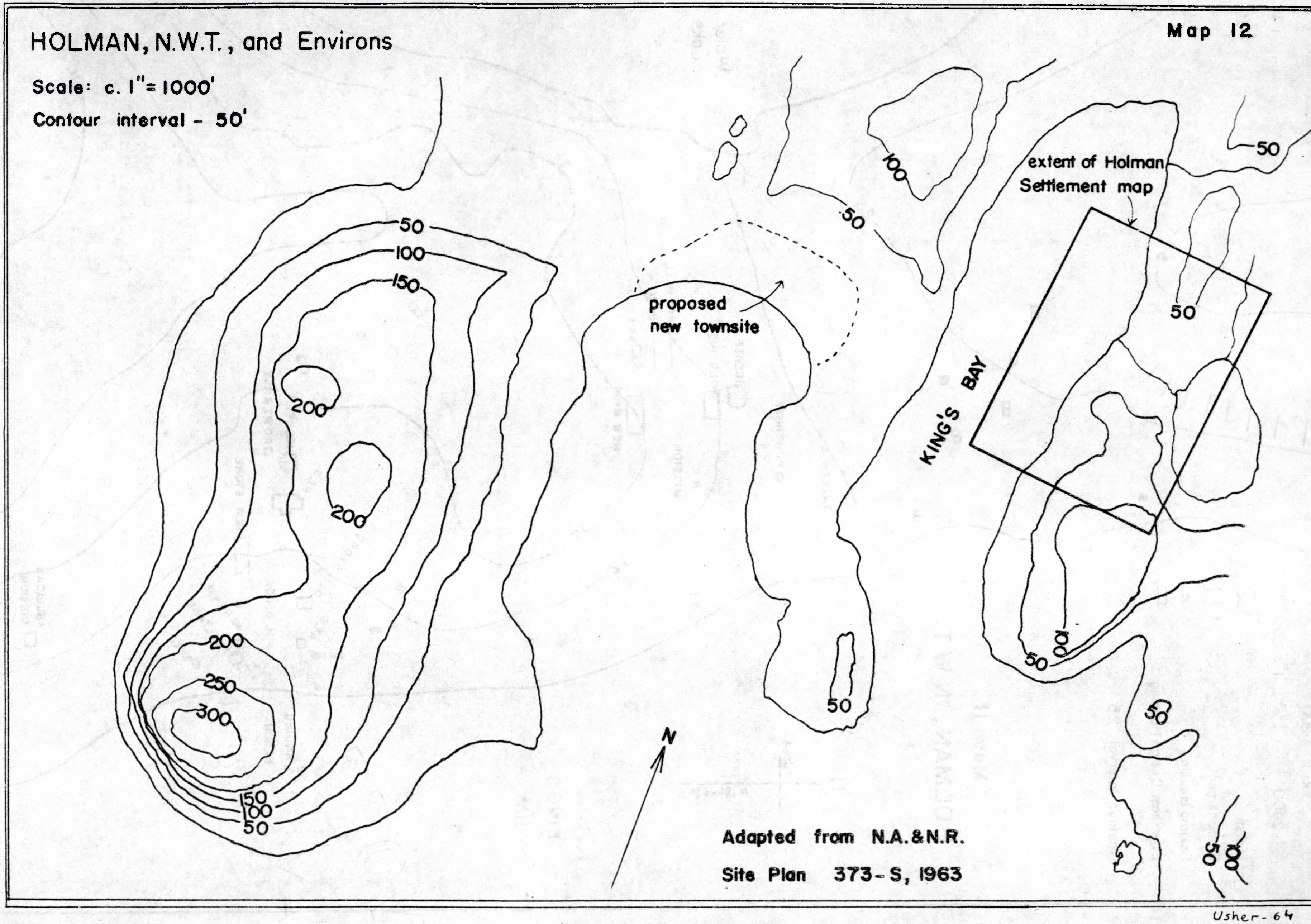
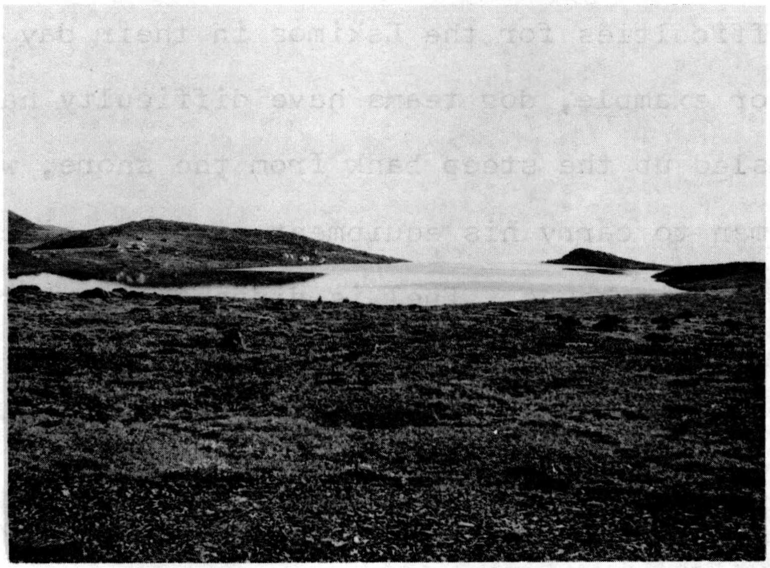

HOLMAN, N.W.T., and Environs
Scale: c. 1" = 1000'
Contour interval - 50'
Map 12
extent of Holman Settlement map
proposed new townsite
KING'S BAY
N
Adapted from N.A.&N.R.
Site Plan 373-S, 1963
50
100
150
200
250
300
Usher-64

Plate 3.



Holman, from head of King's Bay, July 1963
R.C. Mission buildings to left; H.B.C. compound in centre.

Plate 4.

Proposed New Site for Holman, July 1963
Part of King's Bay and the present settlement may be seen in the right background. Note the high cliffs behind the settlement. Patches of snow still remain in higher areas.

create difficulties for the Eskimos in their day to day lives. For example, dog teams have difficulty hauling a loaded sled up the steep bank from the shore, which forces a man to carry his equipment piece by piece from the shore to his house. Fuel is dispensed in large drums, and several men are required to roll such a drum home from the store.

An alternate site, at the head of the bay just west of King's Bay, has been proposed by Archdeacon Sperry of Coppermine. It is a gradually sloping area of raised beaches, consisting of well drained shingle. There is considerably more suitable building space than there is at the present site, and problems of slope would be obviated. An Edmonton engineering firm studied the question of moving the settlement to the proposed new site in Sept. 1963, and they discussed the merits of the present and proposed sites.[3]

Water Supply and Sewage

Water is obtained in summer from a small lake about 150 yards behind the settlement, and is hauled on an individual basis in pails. A few individuals take old fuel drums by boat to a small stream emptying into the head of King's Bay. In winter ice is cut and hauled by

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[3] ibid.

dogteam.

Sewage is dumped out in the bay during winter, to be carried away by the ice at break-up. In the summer it is emptied into the bay or over the ridge behind the H.B.C. compound. This latter area drains into the waterlake, so that any spring runoff, or rain, tends to pollute this lake. This water must be boiled before use.

Garbage is either burned or thrown into open pits, some of which are undesirably close to the houses. On the whole, the settlement has a more clean and tidy appearance than does Coppermine, although similar problems of sanitation exist.

Housing

Eskimo housing is one of the most serious and urgent problems in the area at the present time. Traditionally, the Copper Eskimos lived in igloos in winter, and in skin tents in summer. The decline of nomadism and the development of permanent settlements has led to the abandonment of such dwellings. The Eskimos have desired to emulate the white man's housing, but there are no appropriate building materials available locally,[4] and the cost of importing such materials is far beyond the means of the average Eskimo. Most houses are thus built

[4]Problems of obtaining timber from the Coppermine Valley have been noted in Chapter I.

of scrap materials, salvaged from DEW line or Department of Public Works construction, or from old packing cases. These houses generally have a frame built of scrap 2x4 lumber. The exterior walls are often of canvas tent material, but may also consist of plywood from discarded packing cases, corrugated metal sheets, and occasionally cardboard, tarpaper, roofing material, caribou hides or other such readily available materials. The interiors are generally floored with plywood, and some times are walled with it, but houses incompletely floored can also be found. Permanent insulation is generally lacking, although cardboard or moss is sometimes used. Two or three houses were observed to have been banked with sod to a height of about two feet. In winter insulation is provided by banking snow around and on top of the houses. Almost all of the houses have only one room. A small, rude scrapwood door serves as an entrance, and a tiny opening covered with polyethylene as a window.

The practice of banking snow around the houses for insulation is only moderately successful, and then only between about Christmas and early May, when there is sufficient snow. Before Christmas, the crude shack is subjected to the winds and cold. In spring, when frost accumulations inside the house and the snow outside begin to melt, a cold dampness pervades the home, leading even to mold formations upon the walls.

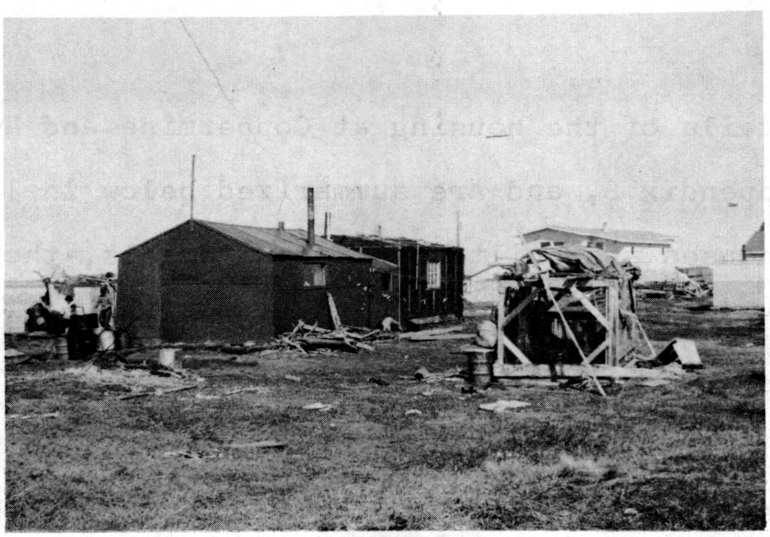
An important part of the house is the porch, which almost all buildings, whether frame or scrap, possess. Many porches consist of a wooden frame, covered with canvas, plywood, cardboard or similar materials. Other porches may consist only of a frame, and are built up with ice blocks in winter. Their floor dimensions are in either case about four feet by six feet. The porch serves two basic functions. One is to prevent direct contact with cold air and winds when the door is opened, and the other is to store hunting and trapping gear. Close to the house is the stage, where meat and fish are dried and stored. A permanent stage is a simple wooden frame enclosed by chicken wire, and a temporary one may consist of a sled supported by two fuel drums (see Plate 8).

Details of the housing at Coppermine and Holman appear in Appendix B, and are summarized below in Table 9. While most houses are built of scrap materials, there are some frame or prefabricated houses of adequate construction built according to architectural plans. Most of these houses were built (and are owned) by government or private agencies operating in the settlements. In Coppermine, five of the frame houses are rented by Eskimos working for those agencies; two are occupied by former agency employees; and the other two are occupied on a welfare basis. At Holman there are seven prefabricated houses and one frame house.

Plate 5.

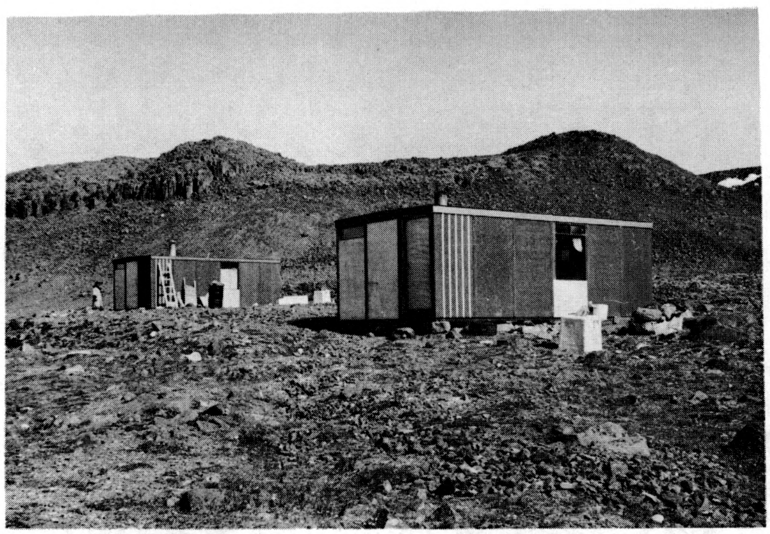
Scrap Housing, Coppermine, June 1963
This is one of the poorest houses in the settlement.

Plate 6.



Scrap Housing, Coppermine, June 1963
These two adjoining houses are about the most substantial scrap houses in the settlement. Note the chicken wire stage to the right.

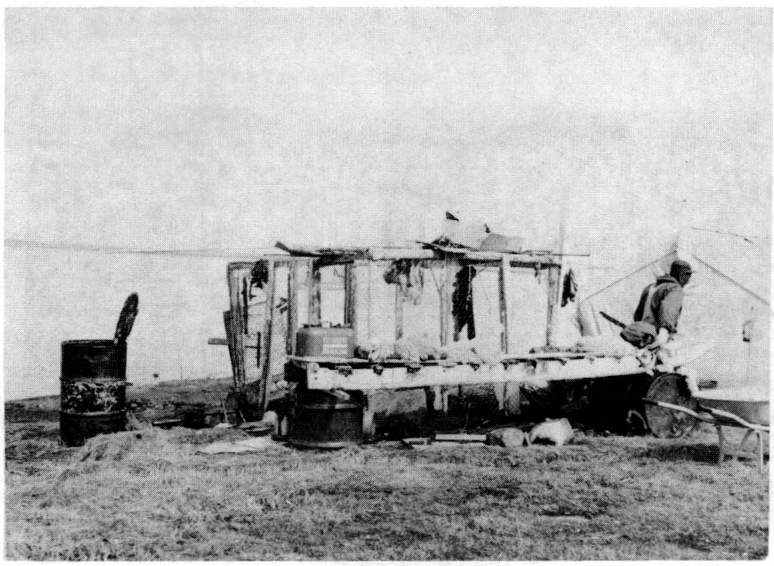
Plate 7.



Prefabricated Housing, Holman, July 1963

These are "Plan 370" low cost houses. The white object in front of the near house, and the one to the right of the far house, are enamel sinks. These are supplied with the houses, but without plumbing they are useless.

Plate 8.



Two types of stages, Coppermine, June 1963

A chicken wire stage at rear, and a temporary one made of a sled supported by two oil drums in the foreground. The upright drum to the left of the stages contains seal blubber.

TABLE 9.--Eskimo Housing, Winter, 1962-63[a]

	Coppermine	Holman
Families	59	20
Individuals	261	110
Houses	52	18
Houses occupied during winter	48	18
Houses of frame design	9	8
Houses of scrap material	43	10

Coppermine

Floor space (sq. ft. per occupant)[b]

type	no. of families	no. of indiv.	no. of families with x sq. ft. per occupant ≤20	21-30	31-40	41-50	51-100	100+	total sq. ft.	sq. ft. per occupant
frame	9	37	0	0	0	2	2	5	3220	87.0
scrap	50	224	14	24	10	0	1	1	5222	23.3
total	59	261	14	24	10	2	3	6	8442	32.3

Sanitary facilities

type	no. of houses	chemical toilet	running water	baths	electricity
frame	9	8	0	0	6
scrap	43	0	0	0	0

Fuel (based on 38 houses only)[c]

type	no. of houses	heating oil	wood	seal oil	gas	kerosene	coal
frame	9	8	1	0	0	0	1
scrap	29	26	15	9	4	1	0
total	38	34	16	9	4	1	1

TABLE 9.--(cont.)

Holman

Floor space (sq. ft. per occupant)

type	no. of families	no. of indiv.	no. of families with x sq. ft. per occupant					total sq. ft.	sq. ft. per occupant
			$\leq$20	21-30	31-40	41-50	51+		
frame	9	46	0	0	3	2	4	2336	50.8
scrap	11	64	3	5	2	1	0	1579	24.7
total	20	110	3	5	5	3	4	3915	35.6

Sanitary facilities

type	no. of houses	chemical toilet	running water	baths	electricity
frame	8	8	0	0	1
scrap	10	0	0	0	0

Fuel[c]

type	no. of houses	heating oil	seal oil
frame	8	8	1
scrap	10	0	10
total	18	8	11

[a] includes housing at the settlements of Coppermine and Holman only

[b] does not include 528 sq. ft. of housing unoccupied during the winter of 1962-63

[c] many families use more than one type of fuel

Certain conclusions are readily apparent from Table 9. On the basis of the fifty square feet of floor space per person deemed a minimum requirement by health authorities,[5] there is serious overcrowding in both communities. Of the 79 families in the two settlements, only 13 have this amount of space or more, and one family in Coppermine has as little as eleven square feet of floorspace per person. Eleven square feet is approximately the area of a small cot or campbed. There is also a significant difference in living conditions between frame and scrap dwellings. Almost all of the families living in frame dwellings have adequate space, while almost none have adequate space in scrap houses. Standards of sanitation in Eskimo communities are minimal. The people lack both sanitary facilities and education in basic hygiene. Some of the frame houses have electricity, and most have chemical toilets, but none have running water. The scrap houses have neither toilets, plumbing, baths, or electricity. Natural functions are conducted outside next to the dwelling, or, in winter, in a tin can or similar type of chamber pot, which remains in the house until its contents are dumped out in the snow nearby. In summer the dogteams remain tied up near the houses and there is considerable fouling at these spots. Garbage is also thrown out indiscriminately in the vicinity of the dwellings. It consists, however, mostly of cans and

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[5] Canada, Department of National Health and Welfare, Information Services Division, <u>Eskimo Mortality and Housing</u>, Ottawa, 1960, p.67.

bones, as very little paper is used. Offal and other unwanted parts of butchered animals are sometimes left lying on the ground, and a dead dog surrounded by flies is a not uncommon sight in summer.

At Coppermine, the housing situation is aggravated by site problems. The majority of Eskimo houses are located on the east side of the settlement in a poorly drained area. In May, when the snow is melting, the appearance of this area is appalling. All the refuse cast out during the winter reappears, with its attendant odour. Small streams of almost freezing water trickle through the area, and foul, stagnant pools form in pits and hollows.

In about late May, often while patches of snow still remain on the ground, almost everyone moves out of the house into a summer tent, which is cooler and better ventilated. This is also the occasion for a thorough spring cleaning of the houses, for much refuse gathers during the long winter. People generally remain in the tents until mid-September.

From June to August the tent is on the whole an adequate summer dwelling. Most are standard 8x10 canvas tents. A typical tent in Coppermine in May, 1963, had no floor, a wood stove, a coleman lantern, two iron bedsteads and a table. One bed has a mattress and the other a sheet of plywood. A radio, a clock, and various odd items lay on the table. Personal effects were contained in a battered steamer trunk under the bed. In the corner near the stove was a litter of pots, pans, containers, scraps, and some store bought food.

There is generally less overcrowding in the tent than in the winter shack, even though the tent is sometimes smaller. This is partly because the children can be outside most of the time, and also because families which share a house in winter generally have separate tents in summer.

Only in the last year has there been any attempt to correct the squalid housing situation in the area. The federal government has initiated a low cost housing plan which has made modest prefabricated homes available to the Eskimos at a minimal cost. A variety of structures are available, but the ones now being brought into the Coppermine - Holman region are all of the "Plan 370" design. This prefabricated one room house has 288 sq. ft. of floor space. It has a small bathroom and a vestibule, and is supplied with a water tank, a sink, an oil stove with chimney, and a chemical toilet.[6] A bathtub and electrical wiring are optional items and have not been ordered in this region. The total cost is about $2000, half of which is

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[6] Canada, Dept. Northern Affairs and National Resources, Northern Administration Branch, Engineering Division, Low Cost Housing, Ottawa, 1964.

subsidized by the government, and the purchaser is allowed ten years to repay the remainder.[7] In July 1963 there were only seven of these houses in the area, all of them at Holman.[8] Their occupants seemed well satisfied with them, although more fuel is required to heat them than an ordinary shack. In some cases ill-fitting sections were noted, which resulted in leaking, although this was fairly easily rectified. Some people expressed the view that an exterior porch would be preferable to the vestibule.

In August 1963, six low cost houses were erected in Coppermine, on a tract of land southeast of the nursing station. This area is a more suitable building site than the area being used at present. Six more were scheduled for delivery to Coppermine during the winter, and another seven for Holman.[9] In addition, there were two welfare houses in Coppermine built by a former administrator from available materials, and three more were under construction.

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[7] Personal communication, G. Abrahamson, Area Survey Officer, Industrial Division, Dept. Northern Affairs and National Resources, Ottawa, October 1963.

[8] In fact these "Plan 370" houses are occupied on a welfare basis and were not brought in under the low cost plan.

[9] Personal communication, Ewan Cotterill, Area Administrator, Coppermine, September, 1963.

Scrap housing exists at some of the most frequently used outlying camps, such as Lady Franklin Point and Read Island, and there are some individual cabins elsewhere. Tents banked with snow are sometimes used in winter. Some individuals in these camps are considering the purchase of low cost housing.

The low cost housing programme is an important step forward for Coppermine, and for other Arctic communities, for while many administrators consider Coppermine to have one of the worst housing problems in the north, it is not unique. The majority of Eskimo homes in the region now are directly inimical to the health of their occupants. In southern Canada such housing would unhesitatingly be classed as unfit for occupancy, and the neighbourhood would be considered a slum. Arctic slums do not suffer from the added horrors of grime and vermin that urban or industrial slums do, but the structures themselves are as mean, miserable and inadequate as may be found anywhere in Canada. Slums in the provinces are commonly associated with degradation, ill health, poverty and welfare payments. Can we reasonably expect Arctic slums to be different?

Home heating

It has already been noted that at least twice as much fuel is required to heat a building in the study area as it would the same structure in southern Canada. Because heating oil in the north costs 79¢ per gallon, as opposed to 17.3¢ in Montreal, for example, the cost of heating the same building in Coppermine is nine to ten times as great. Clearly heating is an important factor in the Eskimo's budget and in the local economy.

Local sources of fuel are driftwood, willows and seal oil. Some driftwood gathers at the mouth of the Coppermine, particularly at breakup. Most of it is gathered within a short time. Wood was used for fuel in 16 of 38 homes during the winter of 1962-63, (see Table 9), and even then only in conjunction with other fuels. Not one family depended on wood alone for heat. The supply of driftwood appears to be used in its entirety every year, and the only way in which the availability of wood could be increased would be through logging in the Coppermine Valley. It has already been suggested that the sustainable yield of this area might be so small as to render such a project inadvisable.

Willows are gathered primarily in the summer when they can be dried, but comprise only a tiny fraction of the total energy consumption in the region. Only at the Rae River mouth camp were willows observed to be in common use in the summer of 1963. They were also used to a lesser degree at Tree River.

Seal oil, once the primary source of heat and light to the Eskimos, is probably the second most important fuel in the area today, next to heating oil. Although seal oil is used only to a minor extent in Coppermine, more families use seal oil than heating oil at Holman. Holman is a good sealing area, and it is not difficult for an individual to obtain sufficient quantities of blubber to last throughout the winter. About half of the annual seal catch occurs in July and August, and their blubber is stored in forty-five gallon fuel drums. The blubber of about ten seals is sufficient to fill such a drum, and in summer the heat of the sun helps to render the blubber into oil. Blubber and oil are generally burned in homemade stoves consisting of a forty-five gallon drum cut in half.

Imported fuels such as heating oil, coal, gasolene, and kerosene provide the bulk of the heating requirements of the Eskimos. Of these, heating oil is by far the most important, and although precise data are not available it seems a reasonable estimate that perhaps 75 percent of the Eskimos' energy consumption is in the form of heating oil.

According to Fr. M. Metayer, "By using anything capable of burning, combined with a frugal use of heating oil, the average shack may be made habitable throughout the winter on 315 gallons [seven drums] of heating oil."[10]

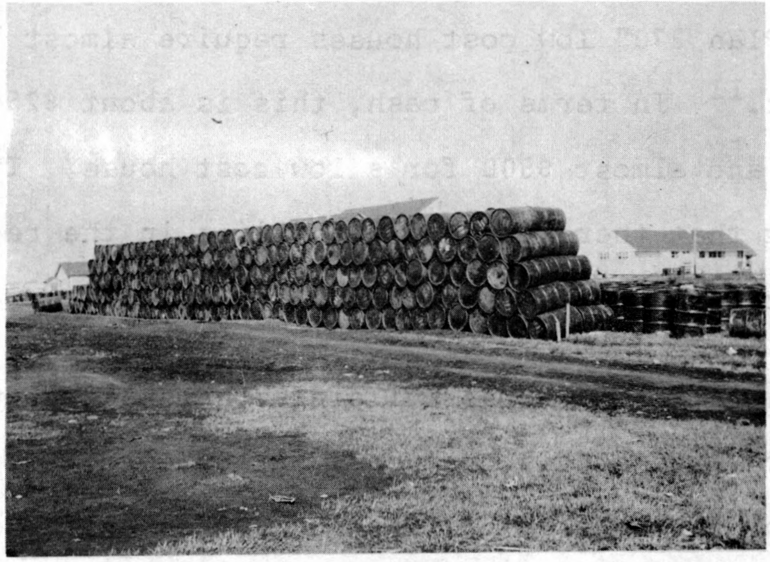
[10] Cited in G. Abrahamson, 1964, op.cit., p.47.

Plate 9.

Soapstone Blubber Lamp, Coppermine, June 1963

A few lamps such as this are still used in the region today. It is made in essentially the same style characteristic of pre-contact times. The pen-knife, about three inches long, in the centre, indicates the scale.

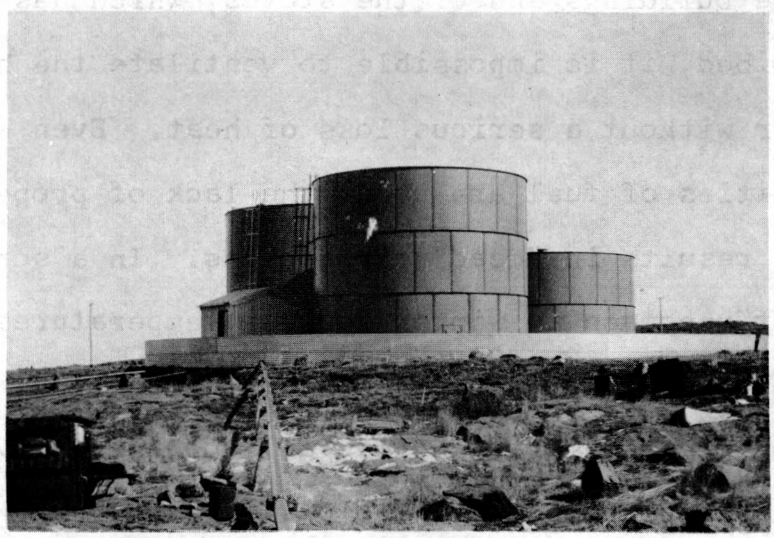
Plate 10.



Fuel Drums, Coppermine, June 1963

Several hundred empty fuel drums, which a year ago contained the settlement's annual fuel supply, are here stacked in readiness for shipment south by boat. This sight will not be seen again at Coppermine; in future fuel is to be stored in bulk.

Plate 11.



Bulk Fuel Storage, Coppermine, July 1963

These tanks, erected in 1962, have a total capacity of 455,000 gallons. Distribution lines feed government and private agency buildings. The change from individual drum to bulk storage reduced the price of heating oil from \$1.05 to \$.79 per gallon.

The "Plan 370" low cost houses require almost twice this amount.[11] In terms of cash, this is about $250 for a shack and almost $500 for a low cost house. It is worth noting that there are a few families in the region who do not earn $500 a year in cash.

In the scrap buildings there are very few factory-made stoves or ovens. A common device for burning oil is a 45 gallon drum cut in half. Fuel is led from a tank through a copper pipe, and drips regularly into the stove.

While much heating oil is given out on relief, the prohibitive cost of it has meant that homes are on the whole inadequately heated. Due to the construction of the buildings and of the stoves, which has been described, it is impossible to ventilate the homes in winter without a serious loss of heat. Even when adequate quantities of fuel are used, the lack of proper ventilation often results in "dead" air pockets. In a scrap house it is not uncommon in winter for air temperatures to be about sixty to sixty-five degrees near the ceiling, and perhaps thirty-five to forty degrees at floor level. Frost may even accumulate between the walls.

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[11]Personal communication, Wallace Goose, Eskimo resident of Holman, July 1963.

Health

Eskimo health is poor by southern Canadian standards, and the basic causes are three-fold. They are poor housing, malnutrition, and almost total ignorance of elementary hygienic practices and sanitation.

Jenness states that disease was virtually unknown between Coronation Gulf and the magnetic pole in 1914.[12] As in other parts of the Arctic, the arrival of the white man was accompanied by tuberculosis, influenza, venereal diseases, measles, and other contagious diseases. The Eskimos had no natural resistance to these diseases, which proved fatal to many of them.

Until 1929 there was no doctor between Aklavik and Chesterfield Inlet, a distance of over 1000 miles. In that year a Dr. R.D. Martin was appointed as resident doctor at Coppermine. He was an indefatigable man but had little in the way of medicines or equipment to help him in his battle against disease, which was becoming widespread at this time. Two years later, he left the settlement in discouragement, because he felt he was not getting the support he needed from his employer, the federal government.[13] Although the Anglican missionary subsequently administered first aid and medication, the

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[12] Diamond Jenness, 1964, op.cit., p. 140.

[13] Richard Finnie, Lure of the North, Philadelphia, 1940, pp. 167-8. See also Chapter 10, pp. 94-112.

region was again without a trained medical officer until the nursing station was established at Coppermine in 1949.

Table 10 is a partial list of epidemics which have ravaged the Coppermine area in the last forty years, and Table 11 shows the ailments treated at the Coppermine nursing station in 1962. It is a deplorable fact that the W2 (Coppermine) health district, with about seven percent of the N.W.T. Eskimo population, has accounted for 202 (or about thirty percent) of the 670 discharges of T.B. patients from hospitals during the period 1946-62.[14] This represents by far the highest per capita incidence of T.B. for any Eskimo health district.

One need not seek far for the reasons for such a dismal health record in the Coppermine district. The crude, squalid homes, and the lack of adequate nutrition and clothing (which will be discussed in greater detail in another chapter) invite the attack of disease, and the terrible overcrowding in winter encourages its rapid spread. Respiratory ailments such as pneumonia and influenza are the chief causes of death, especially among children. The low temperatures which frequently occur at floor level in winter unquestionably have an adverse effect on infants, who are frequently left lying on the floor for long periods.

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[14] Data received by G. Abrahamson, Area Survey Officer, Industrial Division, Department of Northern Affairs and National Resources, from Northern Health Services, September, 1963.

TABLE 10.--A partial list of serious illnesses and epidemics in the Coppermine district since 1928

1928	Influenza epidemic killed half the population at Bernard Harbour.
1930	The resident doctor reported bone and lung T.B. particularly among the natives of Dolphin and Union Strait.
1930-31	T.B. became widespread in the area.
1931	19 of about 100 Eskimos at Coppermine were afflicted with T.B.
1945	Influenza and bronchial epidemics at Coppermine.
1949	Influenza epidemic at Coppermine; 25 deaths.
1952	German measles epidemic.
1954	Influenza epidemic at Coppermine in spring; some developed pheumonia and died.
1955	Influenza epidemic at Coppermine.
1957	Measles epidemic at Coppermine; several deaths.
1960	Influenza epidemic at Coppermine in April; 208 cases, no deaths.
1962	Influenza epidemic in Coppermine area; over 100 cases, no deaths.
1963	Coppermine quarantined for measles at Easter. Mild influenza epidemic in May. Diarrhoea widespread in July.

Sources: Jenness, 1964, op.cit.; Current files of Northern Administration Branch, Dept. of Northern Affairs; Personal communication, Miss D. Clow, R.N., and Archdeacon J.R. Sperry.

TABLE 11.--Common Ailments Treated at the Coppermine Nursing Station, 1962

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Common cold and influenza	12	91	1	14	155	28	52	22	2	2	13	63	455
Infections of the ear, nose or throat	5	73		10	17	31	33	9	3	9	13	17	220
Gastro-enteritis	19	6		16	7	21	45	15	9	1		1	140
Cuts, bruises and sprains	1	7	2	6	4	10	14	18	7	9	12	6	96
Eye conditions	11	5		10	12	1		5	1	3		2	50
Chicken-pox								24	15	2			41
Bronchitis and other respiratory diseases	5	7	11		7		2	3	1	1			37
Skin conditions				1	3	7	5	2	1	2		16	37
Arthritis and rheumatism	7	4		3	1	5	4	3	3	1	1	1	33
Infectious hepatitis									10	2			12

Source: records of the Coppermine Nursing Station.

Infant mortality, while it has been considerably reduced, still remains many times greater than the all-Canada average. More significant is the following statement which appeared in the Report on Health Conditions in the Northwest Territories, 1962:

> "In Southern Canada and amongst the white status population of the N.W.T., the death rate of babies during their first 28 days of life exceeded their death rate for the remaining eleven months of the first year, by more than 2:1. The reverse was true of Indian and Eskimo babies. Their death rate <u>after</u> the first 28 days exceeded their death rate <u>during</u> the first 28 days by nearly 3:1. This points strongly to environmental factors -- poor housing, relative lack of shelter and inadequate heating (borne out by the high death rate from pneumonia), lack of sanitary facilities, exposure to new strains of bacteria and viruses as the North opens up, parental ignorance of proper child care and relative isolation from medical and nursing services. Ignorance of proper nutrition and hence unwise expenditure of the food dollar by those Indians and Eskimos on a wage economy was probably a contributing factor in some communities."[15]

Tuberculosis is no longer fatal in many cases, because most occurrences are diagnosed and isolated on the annual T.B. X-ray survey conducted by the Northern Health Service in each community. Its incidence, however, remains high among both children and adults. Indeed whole families from the Coppermine area have been hospitalized with T.B.[16]

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[15]Northwest Territories Council, <u>Votes and Proceedings</u>, Twenty-Fifth Session, Hay River and Inuvik, N.W.T., Summer 1963, "Report on Health Conditions in the Northwest Territories, 1962", Sessional Paper No. VII, 1963, (Second Session), (Ottawa), p.231.

[16]All Eskimos and Indians in the Mackenzie District

Recovery is a long, slow process, and the danger of recurrence is everpresent. The discharged patient returns to the community in a weakened and debilitated condition, often unable and unfit to provide for himself or herself. Such cases commonly depend on relief for months or even years, and their environment is such that the disease is often contracted again, and readmittance to hospital becomes necessary. Only very rarely does one hear of a spectacular T.B. epidemic in the north nowadays, yet the disease still haunts every community and family, and has robbed the area of more healthy, able-bodied individuals than has any other disease.

The increasing incidence of gastro-intestinal disorders may well be related to the abandonment of the igloo in favour of the shack. The standard of hygiene among Eskimos is totally inadequate. The igloo, whatever its other faults, at least was abandoned before much refuse was allowed to collect inside, which is not the case with the winter shack.

Among other ailments, eye and ear disorders are common, and such diseases as chicken pox and infectious hepatitis occur from time to time. Dental health, once excellent among the Eskimos, is now quite poor, and may be

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and Western Arctic suffering from tuberculosis are evacuated to the Charles Camsell Hospital in Edmonton, where they are treated free of charge.

attributed to the high consumption of carbohydrates, which has replaced the former high protein diet. The region is visited by a dentist only about once a year. One rarely sees an adult with a fine set of teeth, and even then they may prove only to be dentures!

So long as the living conditions of the people remain unchanged, so long will the people be riddled with disease, which lowers morale and limits the effort they can make toward self-improvement.

Education

The present level of education among the Eskimos of the Coppermine - Holman region is very low. A few of the adults were educated at the old mission schools in Aklavik and Hay River. In 1950 a federal day school was built at Coppermine, and the Anglican Mission also operated a summer school with a tent hostel from 1955 to 1959. In the Coppermine area, during the school year of 1962-63, 50 out of 105 children of school age received instruction. Of these, 46 attended the day school (being enrolled in grades one, two and three), and four attended the boarding school at Inuvik. From Holman, where there is no school, 13 out of 42 children of school age attended school in Inuvik.

Certain facts are apparent from this part of the Arctic. Less than half of the children receive any education at all, even now, and those that do are not receiving enough. It is a significant and lamentable fact that in the thirteen years the school at Coppermine has been functioning, not one Eskimo child has continued beyond grade four. It is not the intention here to dwell at length on the problem of Eskimo education, for that subject requires a thesis in itself, or better yet, a practical report with recommendations. However a few observations are in order.

All schools in the Mackenzie district operate on the Alberta curriculum. In view of the disparity of the two environments, one may wonder how well this curriculum prepares a person for life on the Arctic coast. The old mission schools boarded the children throughout the year, and indeed when the children came from remote communities they remained at the school throughout the years of their education. When the federal government assumed the responsibility for education after the second World War, the missions continued to run the hostels. The boarding school at Inuvik now educates the Eskimo children of the Western Arctic, except in such places as Coppermine where there is a day school, although thanks to the aeroplane the children now return home during the summers. Many parents dislike being separated from their children for ten months of the year. On the other hand, in the Coppermine area where many families do not spend the entire school year in the settlement, attendance at the day school is sporadic to say the least. Some children nominally enrolled at the school spend no more than a few days in attendance, and many children spend two or three years in each of the first three grades. It was the observation of the "Area Survey" that the level of achievement at school is considerably higher at Holman where the children attend boarding school than it was at Coppermine. This is true also of literacy in the English language.

Adult literacy in English is low in both communities, but at Coppermine many school children who have been instructed entirely in English throughout their education (largely because none of the teachers speak Eskimo and the government has made no apparent effort to instruct them in it) have a poor grasp of the language.

A few individuals have had vocational training. In 1957 and 1958, courses were offered in heavy equipment operation and maintenance at Leduc, Alberta, to train Eskimos for jobs during the construction of the DEW line.[17] Eleven men from the Coppermine area took these courses. A few boys of high school age have taken or are at present enrolled in vocational courses such as carpentry and mechanics in the Sir John Franklin School in Yellowknife. Unfortunately there is seldom any opportunity to practice these new skills when

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[17] G. Abrahamson, 1964, op.cit., p.51.

they return to their communities. Their training is of no advantage when the only way of earning a living is by trapping, hunting, or emptying garbage pails, and therein lies the basic dilemma of Eskimo education.

A conflict arises between instructing a child in living off the land so that he may engage in the traditional occupations, and instructing him in the type of skills required to compete in the white man's economy. It is difficult for Eskimo parents to see the importance of the latter, particularly as there are very few wage-earning opportunities at present. Yet if education is delayed until job opportunities actually arise, it will be too late, for then the Eskimos would have no way of taking advantage of them. The people must be prepared for the future, and indeed should be placed in a position where they can conduct their own affairs as soon as possible. The desirable goal appears to be that the Eskimo should have the opportunity to make a meaningful choice concerning the way of life he would pursue. Emigration from the area might have to be one of these choices. The problem is, of course, how to achieve this goal. Either the Eskimo learns the traditional way of life and becomes incapable of any radical improvement of his lot, or he goes to school and receives a training which is of little use to him in his community. The trap and the rifle appear incompatible with the school. By spending six years to obtain a third grade education, the child becomes incapable of coping with either way of life, which augurs ill for himself and for his community.

CHAPTER V

TRANSPORTATION

This chapter discusses the transportation of goods and supplies into the region from southern Canada. In general it may be said that shipping costs are very high and that they significantly increase the cost of living in the north. One of the main reasons for high freight rates, whether by boat or by aeroplane, is that traffic is virtually all northbound. Very little is shipped south, and cargoes that are exported are generally of high value and low bulk, such as bales of fur.

Transport within the region, such as by small boat or by dogsled, is best discussed in the context of the hunting economy, and is not included here.

Water Transportation

The traditional method of transporting goods into the area from southern Canada was by boat. The Hudson's Bay Co. sent supply ships to the Western Arctic annually from Vancouver. The route around Alaska was fraught with hazards, and the loss of the *Baychimo* off Point Barrow in 1931 did much to persuade the Company that the Mackenzie River was a superior route to the north, and led to the opening of the transshipment port of Tuktoyaktuk near the Mackenzie Delta in 1934. Most cargo on the river is now carried by Northern Transportation Co. Ltd., a crown corporation. Although the H.B.C. withdrew from river transportation, it maintained its shipping route on the Arctic Coast, based at Tuktoyaktuk.

At present the H.B.C. operates one vessel, the M.V. Banksland, a 440 ton steel-hulled ship. A second ship, the smaller wooden-hulled Fort Hearne, was also used until it was sunk by ice near Bernard Harbour in 1961. The Banksland visits Coppermine twice a year as a rule. Most cargo arrives on the first trip. On its last voyage of the season, when the ship goes as far as Spence Bay, cargo which arrived at Tuktoyaktuk in late summer is delivered to Coppermine. Holman is supplied on a separate voyage.

"The Bay" is now turning its coastal shipping operations over to the Northern Transportation Co. In 1963, the Banksland was on charter to the crown owned Northern Transportation Company Ltd., and it was scheduled to be sold to that company in 1964.

The only other vessel which visits the area is the Expeditor, a 166 ton bulk fuel carrier owned by Arctic Shipping Ltd. Other vessels serve the DEW line in the area, but are not of direct concern here.

Shipping costs to the study area are high, although they remain cheaper than any other form of transport. Freight rates are given in Table 12. Much of the expense is incurred in the long haulage distance, the need for transshipment, and the enforced idleness of the river boats for seven months of the year and of the Banksland for nine.

Problems of water transportation are compounded by primitive port facilities and handling methods. The waterfront at Coppermine lies within the delta of the river, and is therefore quite shallow. Large boats must give the delta a wide berth, and the annual supply ship anchors one half mile offshore, at a point one mile distant from the Hudson's Bay Company dock. This anchorage is dictated not so much by depth, as in fact such a boat could come closer to the settlement, but by the need for sufficient room to swing at anchor. Cargo must be lightered from ship to shore. Although the supply ship has mechanized loading booms, the settlement does not, and lighters must be loaded and unloaded by hand on shore. The stevedoring is done by local Eskimos.

King's Bay is an excellent deepwater harbour, but there is no wharf at Holman, so that cargo must be lightered the few yards to shore. The steep slope up from the landing beach is an added disadvantage.

The need for lighters and the lack of mechanization at both ports inevitably lengthen a ship's turnaround time,

TABLE 12.--Freight Rates and Fares, 1963

<u>Water</u> (Northern Transportation Company Ltd.)

To Coppermine or Holman from:

Waterways, Alberta	$6.35/cwt.
Hay River, N.W.T.	$5.40/cwt.
Norman Wells, N.W.T. (fuel in drums) . . .	$4.95/cwt.

Certain goods, particularly very large items, are carried at a slightly higher rate.

Edmonton to Waterways, via rail	$1.42/cwt.
Edmonton to Hay River, via truck	$2.00-$2.50/cwt.

Trucking rates are somewhat flexible, and are usually arrived at by agreement between the consignee and the trucking firm.

Total cost, Edmonton to Coppermine via Waterways .	$7.77/cwt.

<u>Air</u> (Pacific Western Airlines)

Freight-

Edmonton to Yellowknife, via truck	$3.00/cwt.
Yellowknife to Coppermine via DC4	$7.25/cwt.
Total, Edmonton to Coppermine	$10.25/cwt.
Yellowknife to Coppermine, via Otter aircraft	$40.00/cwt.

Passenger Fares-

	one way	return
Edmonton to Yellowknife via DC6	$56.00	$112.00
Yellowknife to Coppermine via Otter	$110.00	$220.00
Total, Edmonton to Coppermine	$166.00	$332.00

Charter Rates-

	per mile	per hour
Cessna 185	$.65	$85.00
Beaver	$.88	$88.00
Otter	$1.15	$124.00
DC4	$2.00	$380.00

which in turn affects freight rates. However, capital improvements cannot be considered in view of the paucity of traffic.

Air Transportation

In 1960 the completion of an all weather road linked Yellowknife to Hay River and the Mackenzie Highway. Goods may now be shipped quite cheaply by truck as far as Yellowknife, and the shorter distance from there to Western and Central Arctic points has made the winter airlift of cargo in quantity not unreasonably expensive. In late winter, when the sea ice becomes sufficiently thick to bear a DC4 aircraft, landing strips are cleared on the ice at Coppermine and Holman. Airlifts to these points in 1963 were considered a success by the Hudson's Bay Company and by local residents. Although rates are somewhat higher than by boat, the advantage of the airlift is that goods are only a short time in transit and are less likely to suffer damage. The possibility of goods being brought in at more than one season of the year will permit agencies to carry reduced inventories which in turn will lower operating costs. It is quite possible that within a few years, most supplies will be shipped in by air, and boats will be required only for bulk fuel and very large items.

Passengers no longer enter the region by boat, and there is now weekly or bi-weekly air service from Yellowknife to Coppermine. Flights to other points in the region, including Holman, must be arranged by charter. There are several charter airline companies in Yellowknife.

With the exception of the winter airlift, all aeroplanes used in the region are small single or twin engined craft, equipped with pontoons or skis depending on the season. Due to the small aircraft used, the infrequent traffic, and the high cost of fuel, freight rates and passenger fares per mile are much higher than in southern Canada.

Neither Coppermine nor Holman have airfields, although if traffic were ever great enough, suitable sites could be found near these settlements. Each DEW line site has an airstrip, but these are restricted to DEW line traffic.

The dependence on water or ice for landing means that air travel is impossible during break-up and freeze-up, when there is neither thick enough ice nor sufficient open water for landings. Holman is isolated from about mid-June to mid-July, and from mid-September to mid-November, although it is possible for a small aeroplane equipped with low-pressure wheels to land on a raised beach 1500 feet long at the proposed new site. The use of King's Bay for landings during the open water period is complicated by the fact that ice can drift into the harbour at any time during the summer. However, float planes have occasionally landed on a small lake one mile morth of the settlement when conditions in the bay were unsuitable.

Coppermine is unusual in having conditions which allow almost uninterrupted air service throughout the year. During break-up, when the ice directly in front of the settlement begins to rot, ski-wheeled aircraft can still land on the ice beyond the sandbars. By the time this latter ice is unsafe, the river ice has nearly broken loose, and in a few days there is sufficient open water for float planes to land. In the fall, when the ice cannot yet bear a ski plane, landings with wheeled aircraft can still be made on the sandbars near the settlement. The river ice freezes sooner than the sea ice, and landings can be made on the river before the regular winter ice strip is ready.

CHAPTER VI

RENEWABLE RESOURCES

It is estimated that about half of the total income of the Coppermine - Holman region in 1962-63 was derived from renewable resources; that is, from hunting and trapping (see Chapter VII). There is considerable disagreement as to whether or not available renewable resources are adequate to sustain the present population. Some white people in the region insist that the country is rich in fur and game, and attribute the need for relief payments to sheer laziness on the part of the Eskimos. Others feel that the country is resource-poor, and that the Eskimo can no longer be expected to survive on the fruits of the land. Indeed, some would go so far as to say that the Arctic is totally useless, and the sooner everyone is moved out of it, the better. However, these viewpoints are only as good as the weight of evidence which stands behind them. The purpose of this chapter is first to supply the evidence, and then to draw the conclusions.

It is proposed first to introduce briefly the more important species of wildlife upon which the Eskimos depend, although in the case of the caribou, some additional historical discussion will be necessary. Emphasis will be upon the availability of the species. Secondly, the seasonal patterns of Eskimo hunting and trapping, and some of the factors governing their movements, will be examined. Following this, the actual and maximum potential harvests of wildlife will be established, which, finally, will be compared with the theoretical needs of the people.

The Species and Their Availability

Caribou

Much has been written on the barren ground caribou (Rangifer arcticus), but the animal has been of such importance to the Eskimos of the study area that a brief outline of its past and present status is necessary here.

Certain seasonal variations in the animal govern the use made of it by the Eskimos. Caribou are fattest in late summer and fall, and are most prized for food at that time. During the rutting season in the fall, bull caribou acquire a strong taste, and many Eskimos find them inedible at that time. Caribou molt in July, and the new fall coat is short and fine, but the hairs become coarser during the year. Many animals suffer from infestations of warbleflies, which are the chief parasites of the caribou. The larvae grow underneath the skin and bore holes in it. In spring they leave the caribou, and the skin of the animal heals. Thus in late summer, when the coat is fine and the warblefly holes have healed, the skin is suitable for clothing. In winter and spring the pelt can be used for sleeping skins or tents, as for these a coarser coat is desirable and the warblefly holes do not detract from the skin's efficiency.

Caribou feed on lichen, moss and grass. In this way the otherwise useless tundra vegetation is converted into the protein so necessary in human diets. The caribou is a migratory animal, living on the barren grounds in summer and on the forest fringe in winter. In summer, caribou are found individually or in very small groups; large bands being found only in winter or during migrations. As the coastal areas are primarily summer range, and significant migrations no longer occur within the study area, caribou are generally found individually or in small groups. Very rarely, large bands are seen near the settlements in winter. It is not easy to determine the exact numbers and migration routes of the caribou in a given area, but it is incontestable that in the last fifty years the caribou have gradually altered their migration routes and have drastically declined in numbers, both on the barren grounds as a whole and in the study area.

Early estimates of the caribou population between the Mackenzie River and Hudson Bay vary considerably, but it is now supposed that their total numbers were about 1,750,000 prior to the twentieth century.[1] In 1950, Banfield estimated the population to be 670,000; a decline of almost two-thirds.[2] By 1959 the population had declined to 200,000.[3] There is little comparative data for the Coppermine area alone, but there is sufficient evidence to indicate a radical decline in numbers.

Early accounts noted the migrations of caribou from the mainland to Victoria Island in spring prior to break-up, and back to the mainland after freeze-up. The caribou involved in these migrations were somewhat smaller and paler than the present Rangifer arcticus, and their slightly different taxonomic status has led Manning to term them the Dolphin and Union herd, an intergrade between articus and pearyi.[4] He estimates their numbers to have been about 100,000 prior to the arrival of the white man.[5]

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[1] A.W.F.Banfield, Preliminary Investigation of the Barren Ground Caribou, Part I, Wildlife Management Bulletin, ser. 1, No. 10A, Canadian Wildlife Service, Ottawa, 1954a,p.15.

[2] ibid., p.20.

[3] J.S.Tener, "The Present Status of the Barren-ground Caribou", Canadian Geographical Journal, Vol.60,no.3, March 1960, p.99.

[4] T.H.Manning, The Relationship of the Peary and Barren Ground Caribou, Arctic Institute of North America, Technical Paper No. 4, Montreal, 1960, p.5.

[5] ibid., pp.8-9.

The migrations to Victoria Island ceased in the early 1920s, and this herd is now extinct, although remnants of it may have been incorporated either into mainland herds or the resident population of northern Victoria Island.[6] The spring crossing at Bernard Harbour was noticeably smaller in 1916 than previously, and by 1920 had ceased altogether. The last crossings at Coppermine and at Tree River occurred in 1921. Migrations to the archipelago further east, from Kent and Adelaide Peninsulas, virtually discontinued shortly after.[7]

W.H.B.Hoare, a government investigator sent north to study the caribou situation from 1924 to 1926, postulated several reasons for both the abandonment of Victoria Island as a summer range and for the decline in the caribou population which was occurring even at that time.[8] There appeared to be a close correlation between the establishment of posts burning coal or oil as fuel, and the cessation of the caribou crossings near their locations. This led Hoare to the conclusion that the smoke of such fuels alarmed the caribou and prevented them from reaching their traditional crossing points. This theory has not been supported in subsequent literature. However, this, and other of Hoare's findings, led to strict government control over

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[6] *ibid.*, p.10

[7] W.H.B.Hoare, no date, *op.cit.*, p.36.

[8] *ibid.*

the location of posts in the late 1920s.

Another factor was the introduction of the repeating rifle. Drastic overhunting occurred in all parts of the barren grounds. West of the study area, toward the region of Franklin Bay, overhunting was the result of the whalers, who hired Eskimos to obtain their winter's supply of meat.[9] This was not the case in the Coppermine area, nor were there great numbers of white trappers exploiting the caribou. In fact the overhunting was done by the Eskimos themselves.

The primitive method of hunting caribou had been with bows and arrows, or spears. On Victoria Island, caribou drives were often used. The caribou drive consisted of stones piled about every hundred feet in two converging lines. When a group of caribou appeared they were stampeded into the drive. The caribou, apparently not distinguishing between men and stone piles, kept within the confines of the drive, and when they converged at the narrow end, would be slaughtered by hunters lying in wait there.[10] Such drives can still be found on Victoria Island today. On the mainland, drives were apparently not used. Rather, the Eskimos would try to frighten the caribou into lakes, and then set out in kayaks to spear them in the water.[11]

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[9] A.W.F.Banfield, 1954a, op.cit., p.36.

[10] Diamond Jenness, 1922, op.cit., pp.149-50.

[11] ibid., p.149.

The animals were also hunted individually on the tundra, and great skill and patience was required to get close enough to kill an animal with a bow and arrow, for seldom could an arrow be sent more than thirty yards with any accuracy.[12]

The rifle changed all this, as it allowed the Eskimos to kill far more cabibou than the bow and arrow could. Many accounts agree that during migrations, when tens of thousands of animals passed by, that some Eskimos would keep shooting blindly into the herd until their ammunition was spent, killing many more animals than they could possibly use. The abandonment of hundreds of carcasses has been reported. Godsell states that 160,000 rounds of ammunition were shipped to the Hudson's Bay Company's Kent Peninsula post alone in 1923,[13] which is an indication of how the Eskimos' capacity to kill caribou had been increased by the introduction of the rifle.

Hoare also noted that by the mid-1920s, the Eskimos no longer remained on the sea ice until late spring, but went inland as early as mid-March, hunting the caribou long before they reached the coast. The Eskimos had by this time become far more mobile, by virtue of metal sledrunners, easily portable fuel, and larger dogteams, and thus large areas

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[12] _ibid._, p. 146.

[13] P.H.Godsell, "The 'Blond' Eskimos and the 'Created Want'", _Natural History_, Vol. 39, 1937, p.288.

which had formerly been beyond the reach of the Eskimos could no longer serve as sanctuaries for the caribou.

Because of these facts, Hoare believed that the Dolphin and Union herd was prevented from reaching their summer range on Victoria Island, and so were forced to summer on the mainland. There they were far more vulnerable to their natural enemies. This was especially critical as they had formerly calved on the islands. Thus, in addition to the entire population being subjected to increased wolf predation, the young were attacked by eagles, which severely affected the annual calf crop.

How critical a factor eagles were is open to question; certainly they are not now common in the region. The Dolphin and Union herd was decimated partly by the rifle itself, and partly by the indirect effects of the rifle, which kept them on the mainland among their predators. It is not clear today which of these two factors accounted for the greater part of this decimation.

Overhunting also affected the mainland herds which grazed near the Arctic coast in summer but did not cross to Victoria Island (e.g. the true <u>Rangifer arcticus</u>). There is little reliable evidence concerning the size of the herds grazing within the mainland part of the study area prior to contact, but they must certainly have numbered in the tens if not hundreds of thousands. There is another group of caribou to be considered; that being the resident Victoria Island herd. Both Manning[14] and MacPherson[15] are in general agreement that the Dolphin and Union herd occupied primarily the southern part of the island, although some animals did range north of Prince Albert Sound. There was, however, a small herd, akin taxonomically to Rangifer pearyi, which wintered in the rocky uplands of northwest Victoria Island. There was little association between the herds, and the Victoria Island caribou are a distinctly smaller breed. Manning estimated the population of this herd to have been about six to seven thousand before the advent of the rifle.[16]

The number of caribou using Victoria Island alone as summer pasture must have been over 100,000. Possibly as many again grazed within range of Eskimo hunters on the mainland. Since 1916 this number has been drastically reduced.

In 1950, A.W.F. Banfield identified two herds within the study area, and one very large one to the south of it, as follows:[17]

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[14]T.H. Manning, 1960, op.cit.

[15]A.H. MacPherson, Mammal Abundance-Banks and Victoria Islands, N.W.T., During the Summer of 1959, Canadian Wildlife Service, Ottawa, 1960.

[16]T.H. Manning, 1960, op.cit., p.9.

[17]A.W.F. Banfield, 1954a, op.cit., Table 15, p.59.

TABLE 13.--Caribou herds, 1950

Name of Herd	Winter Range	Summer Range	Est. Number
Great Bear	Ft. Franklin-Dease Bay	Richardson & Coppermine R.	30,000
Radium	Hottah Lake	Tree River	5,000
Rae	Lac la Martre	Bathurst Inlet	210,000

The situation has changed considerably since 1950. In the first place, the herds change their feeding grounds and migration routes periodically, and secondly the animals do not remain continuously in distinct herds. What is identified as a herd one year may, over a period of years, either divide, or amalgamate with another herd. J.P.Kelsall noted many changes in the groupings during the years following Banfield's initial study.[18]

It is difficult to state with any accuracy the precise population and range of the caribou in the region at present. Kelsall estimated the Great Bear herd (whose summer range he found to lie between Baillie Island and Coppermine) to number about 34,000 as of 1953.[19] Assuming a fairly regular distribution throughout this area, perhaps

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[18] J.P.Kelsall, Continued Barren-ground Caribou Studies, Wildlife Management Bulletin, Ser.1, No. 12, Canadian Wildlife Service, Ottawa, 1957.

[19] *ibid.*, p.14.

10,000 animals would have inhabited the region between Bluenose Lake and Coppermine. However, by 1955, there were reported to be only 5000 caribou left in the Great Bear Herd.[20]

The Radium herd was supposed to number 10,000 in 1953, and their summer range was north of Point Lake almost to the coast, although there was some overlap with the much larger Rae herd.[21] It was probably this Radium herd which the inland people utilized until the migrations failed in 1953.

Kelsall also identified a coastal herd, consisting of animals wintering on the tundra near the coast, rather than in the woodlands.[22] This herd was thought to number over 100,000, but has almost certainly declined since that time. Most of these animals were in the Bathurst Inlet area, although some have been noted on the high ground south of Coppermine and Tree River. During the winter of 1961, three herds totalling 15,000 animals were sighted at Dismal Lake, Tree River and Takiyuak Lake.[23]

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[20] A.W.F.Banfield, "The Caribou Crisis", The Beaver, Outfit 286, Spring, 1956, p.6.

[21] J.P.Kelsall, 1957, op.cit., p.16.

[22] ibid., p. 17.

[23] Current Files, Department of Northern Affairs and National Resources, Northern Administration Branch, Ottawa, Ont.

In view of the fact that the mainland people are now living almost exclusively on the coast, the number of caribou coming within their present effective range (seldom do hunters go inland more than fifty miles in search of caribou), is almost certainly less than 10,000, and may be as little as 5000. There are now very few caribou on Victoria Island. According to MacPherson, the resident herd numbered about 669 in 1959.[24]

This small number hardly alters the total for the study area, which is estimated here to number between 5000 and 10,000. Much more extensive research would be required to make any more definite statement. However, it seems fairly clear that since 1916 the caribou population of the region has declined by approximately ninety-five percent.

Moose (<u>Alces alces</u>)

The moose, which inhabits a large part of North America, appears to be extending its northward range. Accounts of moose at the Arctic coast or on the barrens are most uncommon in the nineteenth century. In recent years, moose have been sighted at a number of places beyond the tree line. A moose was seen at Baillie Island in the fall

[24] A.H. MacPherson, 1960, op.cit., p.12.

of 1963,[25] which may well have been the first sighting of this species north of seventy degrees in Canada. The "Area Survey" frequently observed moose along the Coppermine River as far north as Sandstone Rapids. The animal is becoming increasingly common in the Rae-Richardson Valley, according to the residents of Coppermine. The moose is a large animal and sometimes weighs over 1000 lbs., thus the bagging of a moose is a significant addition to the family food supply. The total moose population in the study region is unknown, but probably numbers in the hundreds. As it feeds primarily on aquatic plants and willows, it has not, by moving north, become a competitor of the caribou for food.

Muskox (Ovibos moschatus)

The muskox has suffered the same drastic extermination as the caribou, and indeed has been close to extinction. Nineteenth century accounts indicate that muskox were common on both the mainland and Victoria Island. The Eskimos were generally afraid to hunt muskox, having only bows and arrows,[26] so that man was not a predator of

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[25] Personal communication, John Norberg, resident of Tuktoyaktuk, N.W.T., October, 1963.

[26] R.M.Anderson in J.A.Allen, Ontogenetic and Other Variations in Muskoxen, with a Systematic Review of the Muskox Group, Recent and Extinct, Memoirs of the American Museum of Natural History, New Series, Vol. 1,Pt.IV, 1913, New York,p.187.

this animal until the introduction of the rifle. Hoare estimated that overhunting had by 1929 reduced their numbers to about twenty on Victoria Island, and 400-500 on the mainland, including 250 in the Thelon Game Sanctuary.[27] The hunting of muskoxen has since been strictly forbidden to whites and natives alike, and the population appears to be increasing again. On the mainland, growing numbers have been reported inland from the coast between Cape Lyon and Bernard Harbour, although the specific population is unknown. On Victoria Island, MacPherson estimated about 900 animals in 1959.[28] Almost all of these animals occupied the region situated northwest of a line drawn from Prince Albert Sound to Hadley Bay. Local informants maintain that muskox are becoming more common in the vicinity of Holman. Despite the protected status of the animal, killings by Eskimos are not unknown. MacPherson believes that tens of animals per year are taken.[29]

Bears and Wolves

Two species of bear inhabit the region. One is the barren-ground grizzly (Ursus arctos), which is found

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[27] W.H.B.Hoare, Conserving Canada's Muskoxen, Dept. Interior, Northwest Territories and Yukon Branch, Ottawa, 1930, p.51.

[28] A.H. MacPherson, 1960, op.cit., p.9.

[29] ibid., p.9.

only on the mainland, and was by law protected from hunting until November 1963. The other is the polar bear (<u>Ursus maritimus</u>). The polar bear feeds largely on seals and is rarely found on land. It is seldom seen in the waters of the study area in summer, but in winter it is hunted in Prince of Wales Strait, Amundsen Gulf, and the western end of Dolphin and Union Strait. Seldom does it penetrate to Coronation Gulf, and many people at Coppermine have never seen a polar bear. The Eskimos do not use the bearskins themselves, but find a ready market for them among the whites.

Wolves are found primarily on the mainland, but have been seen on Victoria Island. They are occasionally killed because they destroy animals caught in traps. Their fur is sometimes used for parka ruffs.

The Fine Fur-bearers

The fur-bearers are of great importance to the Eskimos, for the pelts of these species are a source of cash to them. The most common fur-bearers in the region are the foxes. Of these, the white or arctic fox (<u>Alopex lagopus</u>), is the most important, and in earlier years formed the backbone of the Arctic economy. The white fox is a scavenger, often feeding on the carcasses left by wolves or polar bears, and may be found on the sea ice or near the coast in winter. In summer it lives chiefly on mice, voles and lemmings, as do other types of foxes. The well known cyclical pattern of lemming populations is closely reflected in the white fox population. The white fox is thought to be abundant about every four years.[30] The seldom-seen blue fox is actually a colour phase of the white fox.

The red or coloured fox (Vulpes vulpes) includes the various colour phases known as red, cross, silver and black. This species is found largely on the mainland, although coloured fox has been taken on southern Victoria Island.

There is no data on fox populations as such, but some idea of relative frequency can be obtained from available figures. Over the five year period 1958-1963, for every silver fox traded in the study area, 10 blue fox, 10 cross fox, 36 red fox and 2253 white fox were also traded.[31] The figure for white fox is in effect weighted to the extent that traps are set in predominantly white fox habitats.

Other fur bearers in the region are the weasel or

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[30] A.L.Rand, Mammals of the Yukon, Canada, National Museum of Canada, Bull. 100, Dept. Mines and Resources, Mines and Geology Branch, Ottawa, 1945, p.35.

[31] Records of the Dept. Northern Affairs and National Resources, Game Management Service, Fort Smith, N.W.T.

ermine (Mustela erminea), and the arctic hare (Lepus arcticus). Wolverine (Gulo gulo), is found on the mainland, and its fur is valued for parka ruffs because of the ease with which hoar-frost can be removed from it. Muskrats (Ondatra zibethica) have been occasionally reported near the mouth of the Coppermine, but they are uncommon and are seldom if ever hunted or trapped. Ground squirrel (Citellus parryii) pelts are sometimes used for clothing in the Coppermine area.

Seals

Two varieties of seals are found in the study area. The most common is the ringed seal (Phoca hispida), also known as the jar seal, or in Eskimo, "netsik". It is commonly found in areas of stable, land-fast ice, thus its prevalence in the area. The average adult is about four and a half feet long and weighs 150 lbs., although 200 lb. seals may be found. The adult ringed seal has a dark grey back patterned with white rings, and the belly is silver. Young seals have a finer textured coat of hair, and the ringed pattern on the back is not so well developed. In summer, they moult, and the skins taken at this time are often unsaleable.

The other variety is the bearded seal (Erignathus barbatus), which is also known as the square-flipper on account of the distinctive shape of its foreflippers. The

Eskimos call this seal the "ugyuk". It is much rarer than the ringed seal, due to its preference for moving ice, and of all seals taken in the area, it accounts for perhaps only one in fifty. The bearded seal is quite large, an adult being on the average over six feet long and weighing perhaps 750 lbs. Its coat is grey-brown in colour and is lighter on the belly.

The seal is used in many ways by the Eskimos; being a source of food, fuel, clothing and cash. Its importance in the Eskimo diet seems to be declining, indeed some do not like its flavour, but it is a major source of dogfood. Because it is water-proof, the skin of the "ugyuk" is valued for boot-soles.

Walrus (*Odobenus rosmarus*)

The walrus is very seldom seen in the Western and Central Canadian Arctic, and those which are seen are presumably strays, either from the Eastern Arctic or the Bering Sea. At Holman, walrus are sighted perhaps every three or four years.[32] The Eskimos are quite unfamiliar with the animal and are extremely cautious about hunting it. In the spring of 1963 a walrus entered King's Bay, and the inhabitants felled it with numerous rounds of heavy ammunition to make sure it was

[32] Personal communication, Fr. H. Tardy, O.M.I., Holman, July 1963.

dead before approaching it. One individual made a dog-line about thirty feet long out of the hide, and another kept the tusks with the intent to carve them.

Birds

There are many species of birds which inhabit the region. The only ones which are used by the Eskimos are ptarmigan, ducks and geese. Ptarmigan remain in the north throughout the year, while the various types of ducks and geese are migratory, and are present only in summer. The role of birds in the Eskimo diet is purely supplementary. Feathers and down are apparently not used, nor is there any indication that eggs are collected.

Fish

There are numerous species of fish in the study area. The most important in terms of consumption is the Arctic char (Salvelinus alpinus). The char is a member of the salmon-trout family, and specimens reaching 90 cm. in length and weighing 20 lbs. may be found. The average adult in the study area is about 50 cm. long and perhaps five lbs. in weight. Char spawn in fresh water, and the young do not migrate to sea until five to seven years of age.[33] Migration occurs just after break-up, when the char

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[33] E.H.Grainger, "On the Age, Growth, Migration, Reproductive Potential and Feeding Habits of the Arctic Char (Salvelinus alpinus) of Frobisher Bay, Baffin Island,"

move out to sea. They tend to feed heavily in sea water and are generally improved in condition by fall. Usually the char remain near the river mouth in summer, but if the feeding grounds there are unfavourable, they will move a considerable distance. Such is the case near the Coppermine River, where tagged char have been noted as far as 82 miles away.[34] Around mid-August the char begin their return to fresh water, and almost invariably return to the river they descended. The fall run upstream lasts longer than the spring run. The run reaches its peak in early September, and is finished by the end of the month. Spawning takes place in October, and most fish spawn only every two or three years. There are no known landlocked char populations in the area.

Two forms of whitefish, Coregonus nasus (broad whitefish), and Coregonus clupeaformis (crookedback) are common in the area. They are fresh water fish, but in summer may be found in brackish bays and estuaries. Although their maximum sizes do not approach those of the char, the average adult weight is four to five lbs.

The Coregonus sardinella or lake herring is also native to the region. The fall run occurs after freeze-up

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Journal of the Fisheries Research Board of Canada, Vol. 10, no. 6, July 1953, p.368.

[34]Personal communication, J.G. Hunter, Fisheries Research Board (Arctic Unit), Montreal, July 1964.

and many are taken at this time. The lake herring is about two lbs. in weight, and ranges up to 25 cm. in length.

Lake trout (Salvelinus namaycush) are commonly found in lakes. 5 lbs. is again a fairly average weight, but specimens up to 30 lbs. have been taken.

Other fish of minor economic importance are the grayling (Thymallus arcticus), the saffron cod (Eleginus gracilis), and the capelin (Mallotus villosus). These last are taken in large numbers as they spawn near the beaches in July, but are very small (app. 10-15 cm.); and a dozen or two are required per person for a meal. Various types of flounders and sculpins also occur in the region.

Seasonal Life and the Use of the Land

The lives of the Coppermine and Holman Eskimos remain closely tied to the land and the water, despite the growth of alternate sources of cash in recent years. Most of the men still hunt to a greater or lesser extent. In a land which yields relatively little within a small unit of area, the hunter must travel great distances and roam large areas to find his game. His movements are broadly governed by a number of factors. Some of these are the location of the habitat of the animal concerned, the nature of the terrain, the seasons, the mobility of the hunter and his inclinations and traditions. Within this framework, the individual hunter seizes his opportunities as they present themselves, and his movements may vary considerably, both from one year to another, and from his colleagues. However, from the sum of the activities of all the hunters in the community, it is possible to make some generalizations concerning the areas utilized by the community at various seasons, and the intensity of this use.

The description of the seasonal activities of the Coppermine and Holman Eskimos, and the maps presented in this chapter, are based on discussions with almost every hunter in the area, and some other informed residents, plus the rather limited first-hand observations that can be made in a three month period.

The term "land use" is used here as a matter of convenience, for the Eskimos do not use the land (and sea) per se, as in an agricultural or herding sense. What is shown on Maps 13 and 14 is the areas in which the Eskimos hunted between October 1962 and September 1963. Because the people are nomadic, such maps show in a very real sense the extensive occupation of the region. They do not show, however, the intensity of land use in any explicit way; on the basis of available data this can only be discussed in very general terms. When using the maps, it is useful to keep in mind the number of families residing at the various camps as an indication of the intensity of use in a given area.

Complete data could only be obtained from a minimum of a year's residence in the area, during which time a continuous record of the travel routes used by individuals and the location of as many kills as possible of the various species would have to be kept.

Coppermine

Once winter has set in, long journeys can be made by dogsled on the land or on sea. Most trappers in the winter of 1962-63 set their lines between Coppermine and "Imariuk" at the head of the Hoppner River, although some ran trap-lines eastward along the coast and through the islands. Those people residing on Victoria Island generally run their traplines along its coast.

The journey from Coppermine to Imariuk, including the tending of traps, requires no more than two days under good travelling conditions. Very few people run long lines, and it is rarely that an Eskimo spends a week on the line. The winter of 1962-63 was a poor one for foxes, being the low year in the cycle, and few trips were made after New Year's. Normally the trapline would be tended perhaps every two weeks, and more frequently if catches were good. In December, when the ice is solid, sealhooks are set, and the hunter often alternates between tending his trapline and his sealhooks.

It seems likely that very few trips are made for the specific purpose of hunting caribou. If caribou or their signs are noted whilst on the trapline, a hunter will go after them. On the basis of nine general hunting licence returns,[35] it appears that caribou are most frequent in the area during March and April, or at least more caribou are taken in those months.

Winter fishing is usually done in connection with trapping. The fish are used primarily for dogfood on the trail, and are often cached at various points.

At Easter, everyone in the region brings their families to Coppermine, to trade, to attend church, and just to be together.

In April and May, as the days grow longer, seals begin to bask on the sea ice. After the trapping season is over, on April 15th, the hunters' efforts turn toward obtaining seals. Many leave the settlement for a week or

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[35] General hunting licences are issued annually by the R.C.M.P. in each community on behalf of the Game Management Service in Fort Smith. In recent years, a small record book has been issued along with the general hunting licence, and the Eskimo is requested to turn this in at the end of the year. The book contains a page for each month, and on each page are the names and pictures of about a half-dozen important animals, against which the Eskimo makes a mark for each one taken. Because the records are seldom kept faithfully, these books are of limited value as a research tool and should be used with caution. Several books together, however, can provide a very general indication of seasonal and annual variation in big game kills. (See also Appendix C.)

two at a time, moving out to the islands in the gulf and travelling from there in search of seals.

Early in June, the sea ice becomes puddled and wet, and travel becomes impossible. At Coppermine, fishnets are set in cracks as soon as they appear, and spring fishing begins in earnest after the ice goes out.

In summer, when the sea is free of ice, and the land free of snow, the Eskimo's movements become quite restricted. On land, he can travel only by foot. In the past, dogs have been used to carry moderate loads on their backs in summer. This was certainly true of the entire region fifty years ago, and Archdeacon Sperry states that packdogs were used by the inlanders until ten years ago.[36] The area survey did not learn of any dogs being used for packing in recent years. The explanation for this is probably the decline of the caribou. Unless there are sufficient caribou in the area being travelled in to be surplus to human needs, dogfood must be carried on all but the shortest journeys. Because there are so few caribou now, there is nothing to be gained by using dogs on the tundra in summer.

This means that the Eskimo hunter travels overland only as far as he cares to carry his gear and his kill

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[36] Personal communication, Archdeacon J.R. Sperry, Anglican Mission, Coppermine, August, 1963.

by foot. Indications are that in practice this is usually not more than five miles from his camp or his boat. The Coppermine people, and those few living at the mouth of the Rae, hunt caribou mainly in their own vicinity, as shown in Map 14. Most hunting takes place in the lower Rae-Richardson Valley, where moose are also found. Canoes are sometimes taken up these rivers as far as they are navigable, which extends the range of the hunter from his camp. Hunting above Bloody Fall is less frequent. The families at Tree River were hunting caribou nearby occasionally, and the two families staying at the head-waters of the Rae were living almost exclusively on caribou.

In summer, caribou meat is cut into thin strips which are dried in the sun. In this condition, the meat requires no refrigeration and can last for months, and is also easily portable.

As there are no important predictable migrations of caribou in the region, hunting is sporadic. Sometimes the hunter sets out in search of caribou where he knows there is a good chance of finding them. Other times, he is alerted to the presence of caribou at a particular place and goes there on that basis. For instance, the "Area Survey" observed a caribou grazing above Bloody Fall, and mentioned this to some people at Coppermine. The following day two of the men went up river after it.

After break-up, sealhunting on the open water from boats takes place irregularly. At Coppermine and Tree River particularly, the emphasis is on fishing after the ice goes out. At this time the char are running, and although fresh fish is the main diet at this time, the bulk of the catch is sun dried for later use. The tending of nets can be done by the women and younger boys, leaving the head of the family free to hunt caribou and seal as he chooses. Open water sealing requires calm weather, which in late summer can be infrequent.

The rather limited areas used by the hunters in summer are in part a reflection of their decreased mobility, and the emphasis on fish, which can be intensively rather than extensively harvested. Another important factor in summer activities is the ready availability of casual wage labour, which many hunters take advantage of. This requires their presence in the settlement every day. For the wage labourer, hunting must take on a secondary role, and can be indulged in only in the evenings and on weekends. This is the main reason that the Coppermine people do not make long boat journeys in summer. Toward the end of July, many people from the outlying camps come to Coppermine to trade and to earn a few dollars on construction jobs or by stevedoring at boat time.

The char run occurs again before freeze-up, and at Coppermine fishing resumes along the river as far up as

Bloody Falls. Fishing continues after freeze-up, with nets set under the ice. The nets are tended by the wives and children at this time and the head of the family goes out to lay his trap line. The trapping season opens on November 1st, and fox fur becomes prime a couple of weeks after this date.

Holman

After freeze-up, most Holman people go to the Kuujjua to fish. Most of the fish caught there is cached under blocks of ice, and brought back periodically to the settlement until about Christmas. Traplines are set early in November, and perhaps two trips are made before Christmas. Caribou are also hunted on these trips. As open water can persist in Amundsen Gulf into November, seals are hunted between visits to the trapline. After Christmas sealhooks are set in the ice, and trapping becomes intensive. If short of food, the men will concentrate on hunting seals for a time during the winter rather than trapping. In a bad fox year, some men hunt polar bear in Prince of Wales Strait in February and March. As at Coppermine, every one in the region comes to Holman to trade and to see each other at Easter. After this, spring sealing is the main occupation of the hunters until break-up, although caribou are also taken.

Summer at Holman is a time of decreased hunting activity, but not to the same extent as at Coppermine. This is partly because there is very little casual labour at Holman in summer, and also because seal hunting is more important than fishing in that season. There are no rivers with important fish runs in the area except for the Kuujjua, where only two families resided during the year under discussion. Toward the end of June, about half the families at Holman moved to "Mashuyak" (local Eskimo name), on the mainland just opposite Holman Island. The protection afforded by the island from heavy seas in Amundsen Gulf makes this area ideal for open water sealing. Duck hunting is also good at Mashuyak at this time.

Around mid-July there is a char run along the coast and nets are set at Mashuyak and in King's Bay. When the fishing is over at the end of July, the people move back to Holman. August is a rather slack month, and some time can be devoted to building and repairing equipment, such as boats and sleds. At this time the people living north of Holman come into the settlement to trade. In late August and September, sealing camps are established on the chain of islands east of Holman. By freeze-up, the people have returned to the settlement.

Changes in Land Use

A summation of land use and seasonal life has been presented for the year 1962-63. It is, however, only one picture in a sequence. How has this pattern evolved from that of fifty years ago? What changes have occurred during that period? To answer these questions in detail, much more extensive research would be necessary. A study of past game records, settlement files, and many more interviews with the older people, would probably reveal sufficient information to construct land use maps for selected years or periods of years in the past. On the basis of present knowledge, only a few general comments can be made.

The transition to the fur trapping economy has already been discussed. Another major change has been the increasing dependence upon marine mammals and fish, due to the decline of the caribou. This has been an important reason for the abandonment of inland areas. Until the early 1950s, people lived at many different points inland.

West of the Coppermine River, Dismal Lake was a commonly inhabited area, but has been completely unused since 1957. East of the River, there was a chain of camps extending from the September Mountains southeastward to Takiyuak Lake (an area known to the Eskimos as "Napartolik"), Itchen Lake, Point Lake, and Contwoyto Lake. These people lived almost exclusively on caribou throughout the year. When the herds did not appear in the fall of 1953, these camps were faced with starvation and the people came to

Coppermine.[37] Stemming from a recent policy of the area administrator to encourage and assist the people to move out of Coppermine and back to the camps, five families went to Contwoyto Lake in the early spring of 1963. However this area does not fall within the scope of the present thesis.

Many of the coastal camps have been abandoned also. Only two families are at Bernard Harbour, and Cape Krusenstern has been uninhabited for many years. Until perhaps fifteen years ago, groups of two or three families used to fish at the mouths of the rivers between the Coppermine and the Tree in spring (particularly at the East Kugaryuak), but these sites have been unused since then. Tree River itself had been unoccupied for about five years until the spring of 1963, when five families settled there on the encouragement of the area administrator.

Other sites are inhabited periodically. For instance, a few families spent the 1962-63 winter at Cape Young and there were others at Locker Point, but these camps were vacated in the spring.

In early 1920s, many Eskimos moved to the mainland from Victoria Island because they were threatened with starvation after the caribou herds ceased to migrate to the

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[37] Personal communication, Archdeacon J.R. Sperry, Anglican Mission, Coppermine, August 1963.

island. The settlement at Rymer Point was abandoned in the 1930s. On southern Victoria Island, the major change in recent years was the abandonment of Read Island subsequent to the closing of the H.B.C. post there. It had been one of the best foxtrapping areas in the Western Arctic, and the Read Islanders used to run long traplines both along the coast, and overland to Byron Bay and to Prince Albert Sound. Liston and Sutton Islands, once the scene of large seal camps in late winter, are now unvisited and unused.

Lady Franklin Point has been one of the few traditional camps to have been continuously occupied in recent years, although this has in no small way been due to the presence of a large DEW line station there. Richardson Island, formerly an important site, is now occupied by one family.

Many parts of northern Victoria Island have also been abandoned in recent years. Signs of former inhabitation are common in the eastern Prince Albert Sound area, where seals and caribou were reported to be plentiful; and even until recently a few families remained there. When the Read Island post closed down, however, the last inhabitants came to live in Holman. Minto Inlet and Walker Bay were also well populated, and the neighbouring shores of Banks Island were often visited. Now only two families live at Minto, and one at Berkeley Point. The Prince Albert

Peninsula has never been extensively used, but two or three families have wintered at Richard Collinson Inlet.

The dependence of the Eskimos on the trading posts is exemplified by the abandonment of large areas following the closing of the Read Island post. Some of the areas have been noted above, and the former Read Island trading area may be seen in Map 8. The closing of Read Island was a reflection of the decline of fur trapping as a major source of cash. The Hudson's Bay Company knew full well that the Read Island Eskimos would gravitate toward Holman or Coppermine, and presumably acted on the basis that they would receive as much business by operating only two posts in the region instead of three. Any decline in country produce would be met by increased welfare payments, and so far as retail trade is concerned, there is no evidence that the abandonment of hunting and trapping grounds in the Read Island area has reduced the total purchasing power of the region as a whole. It is not known whether the abandonment of Read Island has been a direct cause of increased relief payments. If it has, any income in the form of relief rather than in country food would only serve to increase purchasing power at the stores.

It is not meant here to cast aspersions on the policies of the Hudson's Bay Company. It should be remembered that the Company is a business concern, not a welfare organization. If the effects of its policies are not in the best interests of the Eskimos, it serves no purpose to castigate the Company. The federal government represents the people of Coppermine and Holman, and it is the function of that body to formulate policies which ensure their well-being.

It is clear that during the last fifty years there has been a decline in the total area used for hunting. It will now be shown that simultaneously, the intensity of use of certain areas has increased considerably; in some cases to the extent of over use.

Nature of Harvesting and Size of Yields

The purpose of this section is to discuss the numbers of animals taken each year and to determine whether these animal populations are under or over-exploited. Harvesting techniques will also be described. Three species will be discussed: seals, caribou and fish, these being the main sources of country food for the Eskimos. Fur trapping will be treated in the chapter on the cash economy.

Seals

There are three distinct methods of seal hunting, each adapted to different seasons. In winter, when the seas are frozen, seals keep a number of breathing holes open over a small area. The traditional method of seal hunting in winter was to stand over a breathing hole and harpoon the seal as it rose to breathe. This required considerable patience, as the hunter had to remain quite still, and, because the seal had many holes, it might not come up at any specific one for hours.

The use of seal hooks was not introduced to the area until about 1945.[38] The seal hook is a small metal shaft about eight inches in length, usually with three barbs curved upwards. The hook is hung in the seal hole from a line made fast to the ice. When the seal comes up to breathe, it brushes past the barbs, but on its way down is impaled on them, and trapped. An individual sets as many seal hooks as he has (perhaps ten or twenty) within a fairly restricted area. He then caves in the protective snow cover of as many other holes as he can find, allowing them to freeze over, and in this manner forces the seals to use the holes in which the hooks are set. A good dog can smell out seal holes quite successfully. A few men working together can efficiently cover a large area. When an area is exhausted, the hooks are taken up and reset elsewhere.

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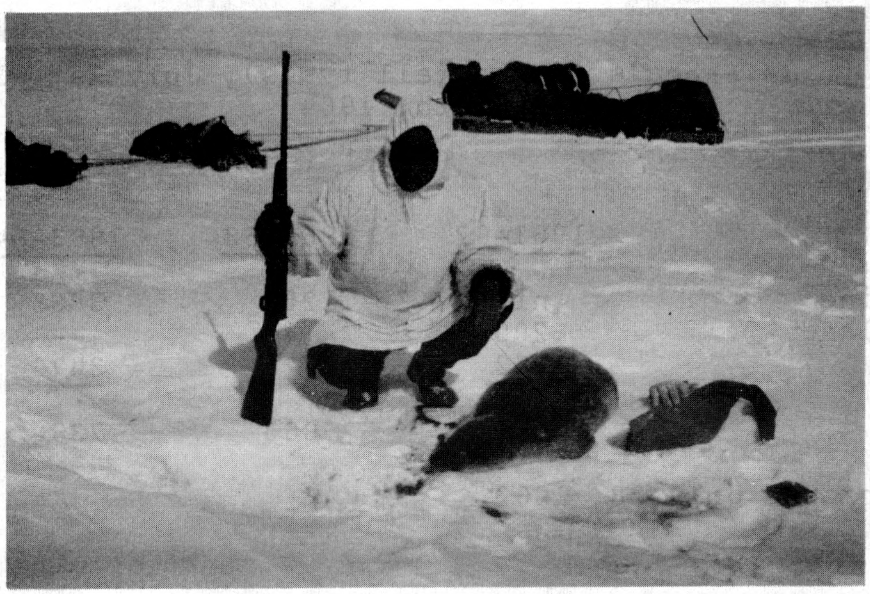
[38] W.F.Joss, "Sealing - New Style", The Beaver, Outfit 280, March, 1950, p.43.

In spring, as the days lengthen, the seals come out of the water and bask on the ice near their holes for hours at a time. The seal must now be stalked, and more skill is required to hunt seals at this time of year than at any other. The hunter travels along the ice with his dogteam, constantly scanning the ice for seals. When one is spotted, the dogteam is stopped a few hundred yards away from it. The hunter then crawls along the ice until he is within shooting distance, if the seal has not already sensed danger and dived down its hole. Square white blinds such as are used in the Eastern Arctic appear to be unknown in the area. Some hunters use a thin white snowshirt over their parkas. As soon as the hunter takes his shot, he runs forward to retrieve the animal, for at this time of year, the seal has little blubber, and often sinks when killed. The body heat of the seal creates a slight depression toward the hole after frequent basking, so that when hit, the seal may slide down the hole involuntarily. Such loss amounts to perhaps fifty percent in spring seal hunting. A fairly light rifle is used for seals. A .22 or .222 is quite adequate for taking a seal, and a larger rifle only damages the animal unnecessarily.

During the summer, seals are hunted from boats or from the shore. When there are still pans of ice in the area, men take their boats along the edges of them to search for basking seals. Later on, seals are shot in open

Plate 12



Seal Hunting Near Coppermine, May 1963

Abraham Carpenter, of Coppermine, has just killed this ringed seal with a .222 rifle, on the sea ice about twenty miles northeast of Coppermine. The seal had been basking by the side of its breathing hole. Note the white snow shirt which Mr. Carpenter uses to camouflage himself when stalking seals.

water as they surface to breath.

It is difficult to estimate the total seal catch in the region. Records of the Game Branch at Fort Smith, dating from 1961,[39] indicate only the number of skins traded. The number of sealskins traded in the region during the last three years was as follows:

TABLE 14.--Seals traded (all types), July 1st, 1961 to June 30th, 1964

	1961-62	1962-63	1963-64
Coppermine	nil	1258	3885
Read Island	299	79[a]	----
Holman	362	1726	3479
Total	661	3063	7364

9800 - 9200

[a]Store closed July 28, 1962.

The remarkable increase in pelts traded during these three years is a direct reflection of the sharp rise in sealskin prices which began in early 1963 and continued into 1964. It is only partly, however, an indication of the number of seals caught. The seal has been a source of food and fuel, and to a lesser extent, clothing, to the Eskimo, and thus the animal has always been hunted to some degree. Increased fur prices provide an incentive to stretch and dry the skins rather than

[39]See Appendix C, Sources of Fur and Game Totals.

discarding them, and this fact is also reflected in Table 14.

It is difficult to estimate how many seals were actually taken in these years. In 1963-64, when prices were consistently high throughout the year, we may presume the number traded to be most nearly commensurate with the number taken. Certain additions must be made, however, to arrive at an estimate of the total seal catch. During July and August, about one quarter of the seals shot are moulting and their coats are unfit for sale.[40] Almost half the annual catch is taken in these two months. This means that to the total number of seals traded, a factor of twelve or thirteen percent must be added to include the unsaleable animals. Because there is an additional percentage of potentially saleable skins which are not traded due to damage, abandonment, or some similar cause, the factor could reasonably be increased to about twenty or twenty-five percent. This would result in a total seal catch of between 8800 and 9200 seals for 1963-64. This, however, includes about 2000 silver jars, which because of their size do not provide nearly the amount of food as would the same number of adult seals.

Prices were not high during all of the twelve

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[40] Personal communication, Wallace Goose, Eskimo resident of Holman, July 1963.

months of 1962-63, and therefore it is likely that an even greater percentage of seals taken were not traded. The actual catch that year may have been over 4000. Even this was considered unusually high for the region at the time, and the 1963-64 total is therefore most remarkable. It must be viewed as the result of absolute maximum effort under present hunting methods; certainly seal hunting was extremely remunerative during that year, and it is difficult to imagine how incentive could be increased.

According to McLaren, the sustainable yield of a ringed seal population is about eight percent.[41] This will vary slightly with the age composition of the population, and the relative numbers of young versus adults killed. In the absence of specific knowledge relating to the region's seal population, the above figure is used here. If 9000 seals can be killed per annum with maximum effort, there would have to be at least 112,500 seals in the waters of the study area to sustain such effort. The seal population of the region is unknown. The effects of radically increased hunting in the last two years will not be known for some time, if indeed there is any marked effect on seal availability. It is certainly not inconceivable that

[41] I.A.McLaren, The Economics of Seals in the Eastern Canadian Arctic, Circular No. 1, Fisheries Research Board of Canada, Arctic Unit, Montreal, 1958, p.16.

overhunting is already occurring in certain areas, particularly in the vicinity of the two main settlements, and therefore a very careful investigation by marine mammologists should be made to arrive at a safe sustainable yield for the region. The hunting of seals without regard to their conservation could lead to the same tragic decline that befell the caribou.

Should the seal population prove to be sufficient to allow increased hunting, present harvesting methods could be improved. Although more seals are taken in the open water season than at any other time during the year, the summer seal hunt is extremely inefficient, even with the use of rifles. Not only is there a high loss from sinking until the late summer when the seals have fattened again, but calm weather is also required to hunt properly from small boats.

Seals can also be obtained during open water season with nets, although nets have not previously been used in the area. This is partly because nets are expensive, and also because the Eskimos are often unwilling to use new methods unless their advantage has been clearly shown. There is no question that seal nets can increase the summer harvest considerably. An experiment conducted on the Belcher Islands in 1960 demonstrated that if an Eskimo set two fifty yard nets at appropriate places, in addition to conducting his normal hunting, his summer yield

Plate 13

Seal Carcasses at "Mashuyak", near Holman, July 1963
Several recently caught ringed seals may be seen here. The ones in the centre ground have already been flensed. Sealing is excellent at this camp in July.

could be doubled.[42] At Basil Bay, the R.C.M. Police caught 67 seals in three weeks using a seal net, in the fall of 1963. During this period, there were only two days in which the water was calm enough for shooting, and only eleven seals were taken by this method.[43] The area survey loaned a seal net to some men at Holman, and these men were pleased enough with the results that they subsequently bought the net. Some maintain that seals which are taken by net develop a bad flavour because they are not butchered soon enough, although dogs will eat this meat. By netting, a sealskin cannot be spoiled by a bullet hole, although net scars may occur. The Belcher Islands experiment showed that frequent attendance of the nets was not necessary; the main limiting factor being that amphipods will ultimately attack and damage a dead animal in the net.[44] A visit to the nets once or twice a week is apparently adequate.

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[42] I.A.McLaren and A.W.Mansfield, The Netting of Sea Mammals, A Report on the Belcher Islands Experiment, 1960, Circular No. 6, Fisheries Research Board of Canada, Arctic Unit, Montreal, 1960, p.9.

[43] Personal communication, Corporal David Friesen, R.C.M.P., Coppermine, November 1963.

[44] I.A.McLaren and A.W.Mansfield, 1960, op.cit., p.6.

Caribou

Caribou are hunted all year around, as previously described. The chief firearm used is the .30-30 rifle, although the .270 appears to be popular in the Holman area. It is not known whether the wasteful hunting practices, such as the use of .22 rifles or the failure to retrieve wounded animals, described by Brack in the Keewatin,[45] occur significantly in this region.

On the basis of individual hunter's reports, plus an estimate covering those men who were not interviewed or who did not recollect their kills, about 400 caribou were taken by people living in Coppermine from July 1962 to June 1963. Most of these were shot in the Rae-Richardson Valley and Coppermine areas. This is probably a conservative estimate. About 15 caribou were taken within a thirty mile radius of Bernard Harbour, 50 inland between Clinton and Young Points, and about 35 on southern Victoria Island. People in the Holman area shot about 150-200 caribou. Of these, possibly 15 to 20 were taken on Banks Island.

There is very little reliable information concerning the utilization of caribou in recent years. In

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[45] D.M. Brack and D. McIntosh, Keewatin Mainland Area Economic Survey and Regional Appraisal, Department of Northern Affairs and National Resources, Industrial Division, Ottawa, 1963, pp.25, 28-9.

some years the Hudson's Bay Company has bought caribou skins, and these are recorded in the Trading and Trafficking Returns. In 1959-60, 500 skins were traded. A police report for 1961 states that over 2000 caribou were taken in the Rae-Richardson-Coppermine area alone, but only 164 were recorded as purchased by the H.B.C. It is possible that the Company only bought skins for a short period during that year, for it is otherwise difficult to believe that less than ten percent of the skins, most of which were taken within a day's journey of the store and are quite easily portable, would have been traded. Possibly a large herd wandered into the area that year, which would account for the high number killed, or alternately the R.C.M.P. estimate was simply too high. In 1961-62, 545 caribou were taken according to G.H.L. Returns, and the true figure was almost certainly higher. It may be concluded that between 500 and 1000 caribou have been taken annually in recent years on the mainland.

Dependence on caribou was much higher in the 1940s. Kelsall estimates a theoretical annual average kill in the Coppermine area between 1943 and 1952 of 4603.5 animals.[46] In the early 1950s, he believed that hunting of the coastal herds generally reached the maximum

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[46] J.P. Kelsall, 1957, op.cit., pp. 26-7, 95.

permissible level, and in some years exceeded it.[47] This was calculated on the basis that the average annual calf crop in the area was twenty percent, and that ten percent were being killed by humans, and another ten percent lost due to natural mortality factors. The causes of the terrific decline in the coastal herds which took place during the late 1950s are not clearly understood, although over-hunting in certain areas was almost certainly one of them.

At present, a balance seems to have been reached, and about ten percent of the animals in the region are shot each year. In the absence of detailed knowledge of the herds in the region, it seems probable that the present level of use represents close to the maximum sustainable yield, and should not be significantly increased.

If there are as few caribou on Victoria Island as MacPherson states, and as many are being killed as calculated here, over-hunting must be taking place. MacPherson recommended that the caribou of Victoria Island be protected,[48] and indeed such a measure may become necessary if any significant decline is noted in the herd.

Fish

The Eskimos catch fish in many ways. By far the

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[47] ibid., p.27.

[48] A.H.MacPherson, 1960, op.cit., p.15.

greatest proportion are caught in gill nets during open water, although nets are also set under the ice in fall, and in cracks or leads in spring. On lakes, in midwinter, holes are chopped in the ice and a line with a hook let down into the water. This practice is known as jigging. Only rarely is the traditional method of catching fish used; that is the spearing of fish in shallow streams during the run.

Arctic char, whitefish and herring are the most important fish taken from the Coppermine River at Coppermine, and are vital to the diet of both humans and dogs in the settlement. About forty families set nets in 1963. During the second half of June, (the height of the spring run), there were about 180 nets set within a mile of the settlement. Individual families set from one to fifteen nets; the average being four to five. Most of these nets were small (perhaps ten yards long by six feet deep), and in need of mending. Both 3 1/2" and 4 1/2" mesh sizes are used. The latter is standard for char fishing, but the former is considered detrimental to the fish in the long run as too many small fish are taken.

It is impossible to record exactly the fish taken at Coppermine. An approximation can be made, using the recollections and observations of local residents, both Eskimo and white, and personal observations. On this basis, the following conclusions were reached. Each family engaged in fishing has taken, in recent years, an average of about 2000 lbs. of char (500 at 4 lbs. each); 500 lbs. of whitefish (125 at 4 lbs. each); and 1500 lbs. of herring (1000 at 1 1/2 lbs. each); or about 4000 lbs. of fish in all. The estimate of char may be considered fairly accurate, while information on the other two species was not as reliable. The margin of error in the herring estimate may be as much as 500 lbs.

There is every indication that char, which appears to comprise about half of all fish taken, is being over-fished in the Coppermine River. Local residents are unanimous in asserting that yields are not as high per unit of effort,[49] and that the average fish is smaller than in former years. The total catch nonetheless has been increased in recent years due to the increasing number of people fishing the river throughout the season. It follows from the above figures that about 80,000 lbs. of char were taken from the Coppermine river in 1963. This compares with a catch of 50,000 lbs. estimated by Fisheries

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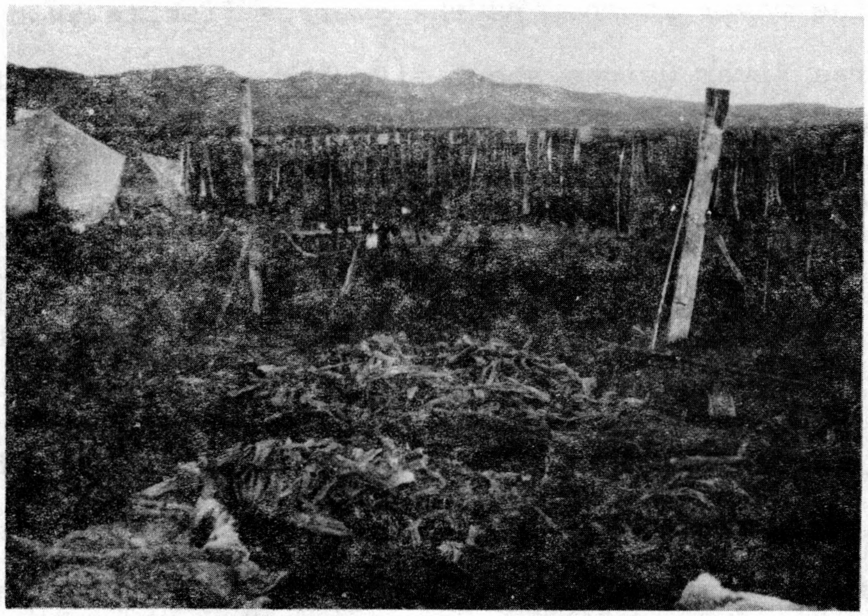
[49] A unit of effort is understood by the Fisheries Research Board, Arctic Unit, as a fifty yard net, six feet deep, left in water for twelve hours. In the present context it may be taken as a net of any given size left in water for a set period of time.

Plate 14



Drying Fish, Tree River, July 1963
Dried fillets are piled on the ground to make room for fresh fish on the racks. About 3600 fish, mostly char, were counted at this camp on July 27th.

Research Board Scientists in 1957.[50]

The Tree River also has an important char run, and the five families resident there in 1963 were living almost exclusively on fish that summer. On July 27th, 1963, about 3600 fish (mostly char) were counted on the drying racks and under tarpaulins at the camp on the east side of the river mouth. As the average fish taken by net at Tree River weighs about five lbs., there were then 18,000 lbs. of fish already dried. Taking into account a small amount of fish at the camp on the opposite side of the river, and the fish which must already have been consumed, ten tons would be a conservative estimate of the take from the spring run. The fall run almost certainly produced an even greater harvest, in view of the fact that the fall run is spread out over a greater period of time, and the fish are somewhat fatter. Thus the Eskimo catch alone at Tree River must have been between twenty and twenty-five tons. In addition to this, the R.C.M.P. caught over six tons for their own use in the fall,[51] and sport fishing was also introduced during the summer. In August, a fish camp was completed, and was used as an outpost of a lodge on Great Bear Lake. The total catch of sport fishermen, who can generally obtain a

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[50]Personal communication, J.G.Hunter, Fisheries Research Board of Canada, Arctic Unit, Montreal, July 1964.

[51]Personal communication, Corp. D. Friesen, R.C.M.P. detachment, Coppermine, November 1963.

char of at least ten lbs. on a rod, would surely have to be reckoned in tons, although there is no precise data available. In short, at least thirty tons, and probably more, were taken from the Tree River system during 1963.

It is doubtful that the fish population could absorb such exploitation for a period of years. Local informants state that the Tree River was abandoned in 1958 due to the decline of fish. Five years without fishing has apparently allowed the fish population to recover, but the present intensive harvesting will certainly deteriorate the situation again. Because the falls are impassable to fish, there is only six miles of river to support the entire population. J.G. Hunter of the Fisheries Research Board states that the system can sustain no more than a ten ton harvest annually.[52] However, with 1100 advance bookings at the fishing camp for the 1964 season,[53] and the possibility of additional Eskimo families moving to Tree River, the immediate prospect is increased rather than decreased pressure on the fish population.

Although the Coppermine and the Tree are the chief sources of fish, limited quantities of fish may be found in almost every river in the region, and along certain

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[52] Personal communication, J.G.Hunter, Fisheries Research Board of Canada, Arctic Unit, Montreal, July 1964.

[53] ibid.

parts of the coast. On the mainland side, moderate yields of char and of various members of the family Corigonidae may be taken in the Rae-Richardson estuary. Most other rivers have enough fish to support one or two families, and Bernard Harbour particularly was a traditional fishing area in pre-contact days. On southern Victoria Island, the Mackenzie River near Richardson Island is reputed to have an excellent char run. Char are also caught at Lady Franklin Point, and in previous years were taken in Forsyth Bay near Read Island. In the Holman area, the chief source of char is the Kuujjua, as mentioned previously, but fish nets are also set at Mashuyak and in King's Bay in the summer months. No data was collected on the quantities taken at those sites. The Kuujjua, which is easily the largest supplier of fish on Western Victoria Island, probably does not yield as large an amount as the Tree.

Inland fisheries are an important source of food on the trail in winter, although this has not been documented quantitatively. Scientists of the Fisheries Research Board use one half pound per acre of surface as a standard rule in determining the annual sustainable yield of northern lakes. Accordingly, Imariuk Lake, northwest of Coppermine, which is the largest and one of the most heavily fished lakes in the Coppermine area in winter, could sustain about a 60,000 lb. harvest per year. This potential is almost certainly never achieved. Whitefish and trout are the chief fish found in inland lakes, and because they are not as fat as the char, are not as highly prized for dog food.

The lakes are useful only in winter when travel to and between them becomes feasible. Even then, they are useful only for resupply along the trail, or for the maintenance of a cache. Because the trapper is carrying a more precious cargo in the form of furs on his sled, he cannot feasibly bring fish back to the settlement in quantity. Seldom does he consider it worth while to make a special trip inland for fish.

In summation, although it is impossible to state either the total sustainable yield or the total annual harvest of fish in the region, it is clear that the two chief sources of fish are being drastically over-exploited. There is a very definite limit to the quantity of fish that the people can expect to safely harvest for their own use; indeed a more careful husbanding of fish resources may become necessary. Moreover there is certainly no basis for commercial fishing in the area, although this has been considered in the past.[54]

Secondary Sources of Country Food

While caribou, seal, and fish form the bulk of

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[54] David S. Wilson, "Processing of Arctic Char at

the country food consumed by the Eskimos and their dogs, there are other minor sources of food.

By their own estimates, people in the Rae-Richardson-Coppermine area shot about 75 moose during the 1962-63 year. It is unknown whether this level could be increased or is already too high.

The fur-bearers are also used for food. Fox carcasses particularly are fed to the dogs on the trail, or may be eaten by the trapper himself. They must be considered a very minor food source, however.

Ducks, geese, and ptarmigan are also taken in the region, particularly in spring and fall. At Holmán, the availability of ducks in June provides a welcome change in diet for the people, but on the whole we must again consider birds as a very minor source of food.

Finally, we have not included in our calculations the fish taken from lakes in winter, although this quantity would certainly be small in comparison to the regular domestic fisheries.

In the absence of precise data, the importance of these secondary sources of food can only be guessed at.

Coppermine", Northern Affairs Bulletin, April-May 1956, Vol. 3, No. 3, pp.7-9.

However, to say that these secondary sources form ten percent of the total food consumption would probably be to err on the liberal side.

Food Requirements

An approximation of total food income has now been reached. We may now turn our attention to the problem of food requirements, and to the vital question of whether these needs are or could be met by available resources. That present harvests do not meet present needs is quite obvious. The fact that large amounts of store bought staple foods supplement the diets of both humans and dogs indicates this in itself. The stock of fish put up for winter dog food at Coppermine is frequently exhausted by Christmas. What is more interesting is whether available food in the region could possibly fulfill the requirements of the people. To answer this question it is proposed to cite a specific case, Coppermine, as it is the largest settlement and the one for which the most complete and accurate data are available. Certain assumptions will be made, which shall in no way detract from the conclusions of this discussion.

For the purpose of this example, maximum possible production on the basis of recent harvests will be assumed. However, as the actual production figures for 1962-63 will be required in the following chapter, they will also be noted here for convenience.

Seals - As some silver jars are included in the seal totals, an adjustment will have to be made for them in food weight. Therefore, three silver jars will be considered equivalent to one adult seal. On this basis, about 1250 seals were taken by Coppermine residents in 1962-63, and in the following year, about 2600, which shall be considered maximum production.

Caribou - In 1962-63, Coppermine residents bagged possibly as many as 500 caribou, or about four-fifths of all caribou taken on the mainland. Maximum production would therefore be about 800 animals.

Fish - The 1962-63 harvest must for convenience be considered equivalent to that of the calendar year 1963. This was estimated at 160,000 lbs. Assuming a higher catch of herring, the maximum catch could be 200,000 lbs.

Other - The maximum estimate of ten percent of total food income by edible weight is used here.

To aid in calculation, edible weight of the harvest is also given. These weights are based on Brack's Keewatin report,[55] and are as follows. The edible weight

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[55] D.M.Brack and D.McIntosh, 1963, op.cit., Table XII, p.54, and Tables E and F, pp.152-3.

of a seal is assumed at 35 lbs., and caribou at 75 lbs. The edible proportion of fish is taken here at 75% of round weight, but only in order to provide a total figure for the calculation of food weight from minor sources. Otherwise round weight is used in the discussion of fish.

In tabular form we see that total edible weight of food obtained in one year by the Eskimos at Coppermine could be as high as 334,000 lbs.

TABLE 15.--Maximum possible food production at Coppermine

Source	number	edible weight
Seals	2,600	91,000 lbs.
Fish	85,000	150,000 lbs.
Caribou	800	60,000 lbs.
Other	n.a.	33,000 lbs.
Total	n.a.	334,000 lbs.

n.a.--not applicable.

The population of Coppermine is 250 Eskimos, and they own about 300 dogs. We must now determine the food requirements of these people and their dogs. As dogs have a fairly standard diet, it will be easier to discuss them first. We have predicated food production upon maximum harvests, and so food requirements shall be predicated upon adequate consumption, irrespective of periods of food shortages and enforced hunger which in fact occur. Single component diets shall also be postulated, for simplicity;

this of course does not invalidate the discussion, for total consumption remains the same no matter how it is divided.

Real work begins for the dogs about November 1st, when the trapping season opens. This continues until the end of May when the spring seal hunt ends. A dog must be well fed during this period, and also for perhaps two weeks prior to the opening of the trapping season in preparation; in all, a period of about 7 1/2 months. During the remaining 4 1/2 months, the dogs are idle and can be adequately sustained on a greatly reduced diet. If a dog is fed solely on fish, it needs about one char a day (or one whitefish with a small blubber or lard supplement) during the peak feeding period. This may be approximated by about 4 lbs. of fish (total round weight) per day. During the summer, about two fish per week are adequate. Total annual requirements are approximately as follows.

7 1/2 months at 1 fish per day	- 230 fish or 920 lbs.
4 1/2 months at 2 fish per week	- 40 fish or 160 lbs.
Total for year	- 270 fish or 1080 lbs.

If all the dogs ate nothing but fish all year, they would require 324,000 lbs. of fish. The total catch, however, is no more than 200,000 lbs. (round weight), or about 60% of the dogs' requirements. The remaining 40%

must be made up, we shall assume, with seal.

When dogs are fed on seal meat, an average sized ring seal is sufficient to feed a team of seven for two days in winter; that is to say a single dog requires about one seal every two weeks. In summer, one seal per week will feed the same team, or, restated, a dog requires about one seal every seven weeks. Total annual requirements would be as follows:

7 1/2 months at one seal per two weeks	- 16 seals or 560 lbs.
4 1/2 months at one seal per seven weeks	- 3 seals or 105 lbs.
Total for year	- 19 seals or 665 lbs.

A total of 199,500 lbs. of edible seal would be necessary to feed the dogs of Coppermine on seal only for a year. (Somewhat more than 35 lbs. per seal may be used for dogfood. However the additional transformation is not vital to the arguement as the numbers of seals remains the same in any case.)

It has been shown that the total fish production will feed the dogs at Coppermine for only 60% of the year. If the remaining 40% of their diet is to be supplemented by seal, 79,800 lbs. of seal would be required. This is somewhat less than the total production of 91,000 lbs.

In fact the dogs eat a certain amount of caribou, fox, etc. in addition to seal and fish, and of course the human diet has considerable variation. This does not invalidate the fact that the total seal and fish production at Coppermine is barely enough to feed the dogs alone.

Supposing the dogs to be adequately fed, does there remain sufficient food for the people? The single most important source remaining is caribou. It is difficult to state the theoretical requirements of an Eskimo family, because in fact their diet is so varied. Actual caribou consumption per family may range from one or two animals per year to at least thirty, but this is always in conjunction with other foods. It is reasonable, however, to suppose that a family of five (two adults and three children) eating nothing but caribou, would require about one caribou per week (c. 2 lbs. per person per day). This is about 50 caribou per year, or for the settlement, 2500 caribou. The actual take of 800 would not even last four months at this rate of consumption. The remaining seal and other foods total 44,200 lbs., rather less than the total edible weight of caribou alone. Assuming this food to have approximately the same nutritional value as caribou, it would last almost three months. Thus, having fed the dogs on our theoretical maximum production, we find the amount left to be only enough to meet about half of the human requirements.

It can clearly be seen that even maximum possible harvests could not fulfill the present food requirements of the region. Fifty years ago, however, the people lived entirely off the land. Why can they no longer do so?

Changes in the recent past have already been discussed, but a brief review of the most important points is in order here. The population of the region at the end of the pre-contact period (early twentieth century) was between 400 and 450 people. This population made extensive use of the land and its resources, roaming over most of the area in the course of a year. Today the population is over 500 and is rapidly increasing, but has congregated at select points and remained there through most of the year, resulting in a far less extensive use of the land. The character of the population has changed, in that there is now a greater proportion of children and old people, requiring greater productivity on the part of the hunter. The dog population has radically increased, placing an added strain on resources. At the same time, the availability of an important resource, caribou, has undergone a sharp decline. This has forced the Eskimos into a greater dependence upon fish and seals.

Before the arrival of the white man, and for some years after his arrival, the Eskimos lived entirely upon renewable resources. (This, however, should be qualified -

those who contend the Eskimos were self-supporting should remember that periodic famines resulted in death by starvation for a part of the population). We have no idea of population fluctuations prior to contact, and in the absence of further research, can only tentatively suggest that the population which existed in the second decade of the twentieth century was in equilibrium with available resources. If this was the case, it would follow that because available resources have decreased, and demand has increased, that it would not be possible for the present population to live solely on renewable resources today, even if they desired to do so. This also assumes that changing technology would not allow increased harvests without disrupting the ecological balance of the region. In fact this assumption is probably reasonable, for the technological changes in hunting methods which have occurred only ensure a more efficient and thorough harvesting of available food; they do not increase the actual sustainable yield.

If the pre-contact population was for some reason not in equilibrium with the resources, the logical answer to our problem would be to increase the harvest of renewable resources. There are two ways of increasing resource harvests. One is to intensify effort at a given locality, and the other is to use the region more extensively, that is to live in places uninhabited at present, and to hunt in areas now unused. The second method assumes essentially immobile resources, or at least resources which do not at any time occur in the presently used area. In the case of caribou, which are migratory, more extensive hunting within the region would probably not bring the hunter in contact with a new population. This can only be done by moving at least as far as Contwoyto Lake (which a few individuals have done), but this is outside the study area. However, as it has been suggested that present harvests are at best in equilibrium with the caribou population, more intensive hunting is not feasible either, and therefore there can be no significant increase in caribou hunting in the region.

Neither the extent of ringed seal migrations, or total seal population in the study area is clear. Whether substantial increase in annual harvests is feasible, in keeping with the conservation of this species, is therefore unknown, and this question would require extensive research on the part of marine biologists.

Fish more nearly meet the requirements of the second method (extensive harvesting). At presently inhabited sites, there is excellent evidence that fishing is already too intensive and should be decreased, if anything. The situations at Coppermine and Tree River have been cited. The only way in which fishing could be increased would be to utilize lakes and rivers not presently fished. Rivers have limited potential, but the inland lakes represent a tremendous untapped food supply.

Certain increase in food production, therefore, whether by intensive or extensive methods, can only come through the development of inland fisheries. Any other method of increasing production must be regarded, on the basis of present information, as inconsistent with sound resource management principles and therefore should not be attempted.

Several fairly large lakes could be utilized for inland fishing; among them would be Bluenose, Dismal and "Imariuk" Lakes on the mainland, and Takiyuak and others on Victoria Island between Richardson Island and Prince Albert Sound. Any one of these could probably support three or four families, or more if only some of them were used at any one time, on a rotation basis. In 1963 the area administrator at Coppermine encouraged several families to move out of the settlement to satellite camps. It was agreed that regular monthly visits by the administrator and the nurse would be made to these camps, in order to ensure medical care and resupply if necessary. Similar assurances would certainly have to be given to families moving to the inland lakes, for the main attraction of settlement living has been the knowledge that emergencies such as sickness and famine can be quickly rectified. Because present fish catches on the Coppermine should be reduced, the utilization of inland fisheries would in part only make good this reduction, so that the net increase in food production would not be equivalent to the total quantity of fish taken from the lakes.

CHAPTER VII

CASH INCOME AND EXPENDITURES

Cash is playing an increasingly important role in the Eskimo economy. Opportunities to earn cash have increased in recent years, and the people have become increasingly dependent upon commodities which can only be obtained with cash. This chapter is divided into three parts. The first examines the sources of cash income, and their future prospects, and in the end tries to assess the total income, in cash and in country produce, for the region. The second part examines the patterns of expenditure, and the cash requirements of the people. The third section discusses some problems of the present economic situation, particularly the lack of investment capital.

INCOME

It has been shown that available resources can not by themselves sustain the population as it is now distributed. It is, however, not necessary that the people be supported solely by renewable resources (which, it should be remembered, once supplied them not only with food but with heat, light and clothing). There are other gainful activities besides hunting, all but one of which are independent of renewable resources. These activities provide the people with a cash income, which is becoming an increasingly important part of their total income. It is therefore opportune to consider at this time these other sources of income, and to see whether total income meets the needs of the people.

An Eskimo in the study region may obtain cash in five different ways, which will be discussed as follows. Under a general heading of earned income, we may distinguish between trapping, wage labour (permanent and casual), and handicrafts, while unearned income would include social security payments and relief. Each source of income will be discussed separately, and then the cash economy will be viewed in its entirety. Earnings by family from all five sources may be found in Appendix D.

Earned Income

Furs

Until 1963, the white fox was the basis of the fur trade in the study area, as it was throughout the Arctic. The history of the fur trade in the Western Arctic, although of great interest, will not be discussed here except to note briefly its more significant effects on the study area. In the early twentieth century, fox furs commanded very high prices. During the great depression, these prices steadily declined, and except for a brief period during World War Two, have remained at rather low levels to this day. Because traders did not penetrate the study area until the latter days of the fur boom, and because at first the Eskimos were grossly underpaid for their furs, two significant differences arose between the Copper Eskimos and the Mackenzie Delta people who had been in contact with the traders for some decades previous. There did not arise in the study area a generation of really excellent Copper Eskimo trappers, because there had been less opportunity for them to learn the trade during the peak trapping years. Secondly, in the Mackenzie Delta, where the trappers had received top prices for the furs in the 1920s, the people amassed capital goods on a large scale. Some of these goods, such as schooners, remain in the area to this day, and continue to be of benefit. This capitalization on the part of the Eskimos never took place in the study area, and while the Copper Eskimos did not suffer the same descent from opulence that the Delta people did, neither did they receive any of the benefits from that era.

White fox are characterized by extreme cyclic variations in population. During the last thirty years the price of fox fur has also fluctuated, but there has been little correlation between the two variations. That is to say, scarcity of pelts is seldom reflected in high prices.[1] Table 16 shows the volume of furs traded in the study area since 1958.

During this period, white fox fur prices averaged from ten to twenty-five dollars. In the winter of 1962-63, which was one of the poorest trapping seasons in many years (most Arctic posts recorded an unusually low volume of fox furs), a trapper could expect to receive approximately from seven to sixteen dollars depending upon the condition of his pelts.

Sealskins, which for a number of years the traders had either not bought at all, or paid very low prices for, came into fashion in 1962, particularly in Europe where demand rose rapidly. In the summer of that year, the Hudson's Bay Company began buying sealskins in quantity from the Eskimos, and by May 1963 they were paying over ten dollars for a mature pelt in the study area, and more for a silver jar. During the year following, an Eskimo could obtain twenty dollars for a mature pelt, and thirty for a silver jar. Good pelts were at times able to bring considerably higher prices. One can only speculate on how long these high prices can be maintained. That the H.B.C. posts were shipping sealskins out by air in the summer of 1963, whereas furs are normally shipped out by sea, is an interesting

[1] Government of the Northwest Territories, Game

TABLE 16.--Furs traded at Coppermine, Read Island & Holman, 1958-64

Year	Polar Bear	Wolf	Fox					Seal		Hare	Weasel
			Blue	Cross	Red	Silver	White	Ringed	Sil.Jar		
			Coppermine								
1958-59			1	3	16		710				
1959-60	3	2	6	14	73	1	468				1
1960-61	1	1	5	7	33	1	1470				10
1961-62			5	13	28	2	588				6
1962-63			1	1	9		284	1170	88		
1963-64			5	18	75	1	2294	3031	852		
			Read Island								
1958-59	3		2	1			723				10
1959-60	1			1	4		396				
1960-61			5	6	15		2467				20
1961-62			2	2	2		1624	262	37		9
1962-63	(Post closed July 28, 1962)							79			
			Holman								
1958-59	13						675				23
1959-60	29						52				1
1960-61	13		37	2	4	1	3202				10
1961-62	8		8		4		1015	106	256	20	21
1962-63	2		2				472	1263	463	49	2
1963-64	26		4				1246	2337	1142		
			All Three Posts								
1958-59	16		3	4	16		2108				33
1959-60	33	2	6	15	77	1	916				2
1960-61	14	1	47	15	52	2	7139				36
1961-62	8		15	15	34	2	3227	368	293	20	30
1962-63	2		3	1	9		756	2512	551	49	2
1963-64	26		9	18	75	1	3540	5368	1994		

Table does not include: 1 unspecified bear (1958-59), 1 Wolverine (1959-60), 1 Marten (1960-61), and 2 bearded seals (1963-64), all traded at Coppermine.

Source: 1958-61 - Fur Export Tax Returns, 1961-64 - Trader's Fur Record Book; Game Management Service, Fort Smith, N.W.T.

commentary on the Company's own view of the current boom. In some parts of the Arctic at least, prices have already declined from the peak prices paid in late 1963 and early 1964.[2]

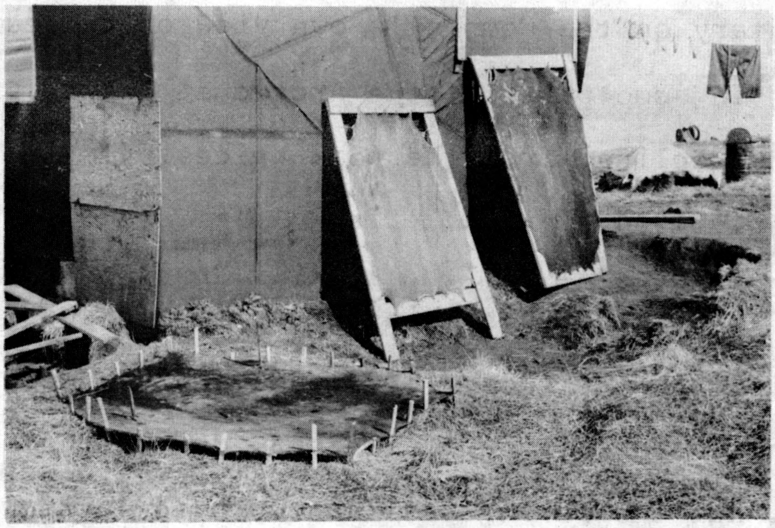
Present sealskin prices have unquestionably benefited the Eskimos. Trapline earnings were virtually nothing in the winter of 1962-63, due to the scarcity of foxes, but the spring seal hunt proved sufficiently remunerative that total fur earnings actually increased from the previous year. During the 1963-64 fur year, more fur by value was traded at Coppermine than at any other post in the Western Arctic, or in the entire Mackenzie District for that matter. The post had not even approached this distinction in recent years, and indeed may never have.

A study of Appendix D will show that not only did community income from furs increase in 1962-63, but also that more families partook of these earnings. Suffice it to say here that less mobility and capital equipment is required for seal hunting than for fox trapping; a more intricate discussion of this question will be found in an ensuing section.

Management Service, Northwest Territories Graphs Showing Fur Take and Average Prices by Species, 1962, p.11.

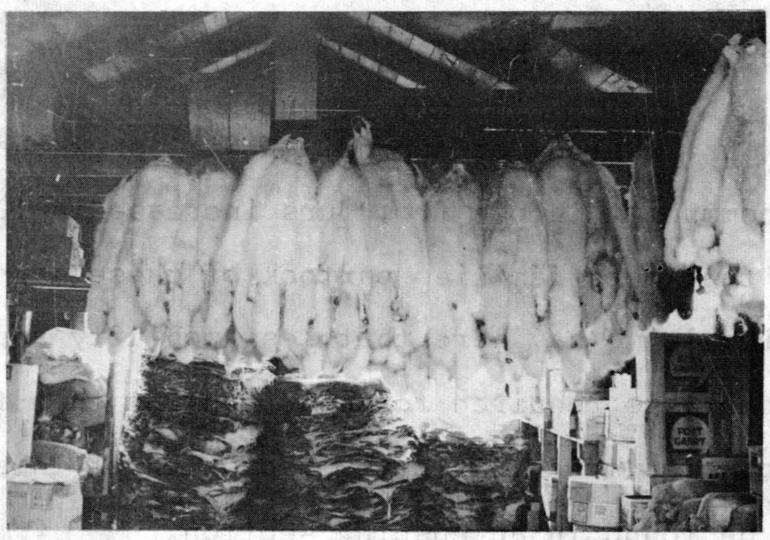
[2]Personal communication, Mr. J. Stevenson, Manager, H.B.C. post, Cape Parry, N.W.T., October, 1964.

Plate 15



Preparing Seal Skins, Coppermine, June 1963
After the blubber is flensed from the hide, the skins are stretched and dried. Two methods of stretching may be seen here.

Plate 16



A Year's Fur Harvest, Holman, July 1963
Several hundred seal skins are stacked on the floor of the Hudson's Bay Company warehouse at Holman. Most of the pelts hanging from the rafters are white fox, although some are arctic hare. These furs were subsequently shipped south on the annual supply vessel.

Fox trapping has on the whole decreased, relatively, in recent years, as a source of cash income. It is an activity which appears to suffer from the concentration of people in settlements. It has been noted that most Coppermine people trap the area between the settlement and Imariuk. This area, not noted for its high fox yields in any case, is almost certainly over-trapped at present. On the other hand, the rich areas of Wollaston Peninsula and southern Victoria Island have been under-utilized, particularly since the closing of the post at Read Island. The intensification of trapping in this region, and the dispersion of present traplines on the mainland, would certainly lead to increased fox fur production. The factors militating against such developments are basically twofold. One is the problem of obtaining food on the trail. Van Stone has suggested, in connection with the Snowdrift Indians, a definite relationship between the availability of caribou and the disposition of the trapper to tend his line.[3] Certainly in past years the Copper Eskimos have fed their dogs caribou while on the trail, and the decline in caribou may well have been a factor in recent trapping patterns within the study area. The second problem in improving trapping yields is one of capital

[3] J.W. Van Stone, "Changing Patterns of Indian Trapping in the Canadian Subarctic", Arctic, Vol.16, no.3, Sept. 1963, pp.162-3.

equipment; discussion of which shall be deferred for the present. An examination of Table 16, remembering that many more trappers traded at Coppermine than at either Read Island or Holman, will indicate the relative yields of Victoria Island versus the mainland.

Whether there has been a long term absolute decline in foxtrapping is not clear. Further research into old game records and former trapping patterns would be required to answer this question. Certainly the area supported a large number of posts in the early 1930s, both on the mainland and on Victoria Island, and it remains to be seen how many furs these posts took in during their peak years; for their decline, as mentioned in Chapter II, appears to have been due to factors other than a long term decline in the number of fox furs taken.

At present, trapping provides a surprisingly small proportion of the total cash income, in an area where most of the labour force would be classed as hunters and trappers.

TABLE 17.--Fur trapping income, 1962-63.

	Coppermine Settlement	Coppermine Camps	Holman & Camps	Total Region
% of total income	9.6	34.9	45.5	20.6
Ave fur income of families with active trappers	$221	$331	$842	$396
% of families receiving income from trapping	88.1	90.0	100.0	91.2

In 1961-62, trapping income per family engaged in trapping averaged just over $300 in the region, while in 1963-64, the average jumped to about $1720. This last year must be viewed as unusual. Trapping income in the area has almost certainly not approached this figure in the last decade and indeed may never have done, while if seal prices fall, it is unlikely that the figure could be achieved again without a commensurate sharp rise in fox prices. 1963-64 not withstanding, the average trapper has earned, and can expect to earn, no more than $300-400 per year. Indeed most would earn less, as the median income from trapping is consistently lower than the average income. This situation is not unique in the Canadian Arctic today - Jenness cites numerous studies which indicate that the average Eskimo trapper earns $200-300 per annum.[4]

Wage Labour

Permanent employment. - Only eleven Eskimos, from ten families, work for wages on a permanent basis. All these people live in Coppermine, and are employed either by the federal government or the Hudson's Bay Co. Their jobs are largely of an unskilled nature; consisting of

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[4]Diamond Jenness, 1964, op.cit., pp.101-2.

janitorial, clerical, or maintenance duties. Only one of these positions, that of the R.C.M.P. Special Constable, utilizes the Eskimos' traditional skills, such as hunting. With the exception of the school cook, whose job is only part-time, and one other man who was hired in the middle of the year under discussion, these full time employees earned from $1200 to $6000 per year. This disparity in wages reflects the particular employer's policy more than the relative skills of the employees. The Eskimos appear to be in no position to argue about their wages, in view of the scarcity of employment. Although it is not clear how many Eskimos would at this time assume permanent wage work if it were offered to them, this writer has not heard of a case where a willing man could not be found for an open position. Despite the existence of some remarkably low wage levels, it may be noted that in Coppermine, ten families received about three times as much from permanent employment as fifty-two families did from trapping.

The question of whether the Eskimos can begin to displace the whites in responsible positions in northern communities, and thus assume a more dominant role in their own affairs cannot be adequately discussed here. Education appears to be the main problem; without it, the people cannot hope to better themselves in any significant way. While it may be a long time before Coppermine has an Eskimo teacher or administrator, it would not need a long-term programme to train Eskimo radio operators and meteorological technicians, who could be employed at the D.O.T. weather station. It should be borne in mind, however, that there are but twenty-two gainfully employed whites in the entire region (DEW line excepted). In short, there are not now, and will not be in the foreseeable future, sufficient job opportunities for the entire labour force, or even a large part of it. This does not appear to be a serious problem at this time, as the bulk of the labour force may not want, or be equipped to assume, permanent jobs. As more children continue through school, however, and more young people receive vocational training, there will be an increasing number of semi-skilled or even skilled Eskimos who will not be able to obtain employment in the region.

It is at present difficult to imagine what could generate a substantial increase in jobs, either of the type which Eskimos now hold, or which they could hold in the future.

Since the intermediate DEW line sites were closed, there have remained only two active sites in the study area, although an Eskimo can be employed at any station in the Canadian sector. Each of these stations employs two Eskimos. A few men from the study area are employed on the DEW line. Their salaries can range from \$200 to \$450 per month, depending on their skill and length of service. As mentioned, these men are in effect isolated from the Eskimo economy during their term of employment, except in a few cases where relatives might camp near the site and benefit to some extent from the man's wages. However, when they return to their communities they have capital to spend, and the consequences of this will be mentioned subsequently. In 1963, Canadian National Telecommunication commenced construction of a tropospheric scatterwave station at Lady Franklin Point, designed to link that place with Hay River. This has provided a few short term jobs for Eskimos from Coppermine and adjacent points.

Casual employment. - The prime generator of casual employment in the area is construction, and this has probably been the case for at least five years, on account of the expanding role of the Dept. of Northern Affairs. In earlier years, an important source of casual earnings was stevedoring when the supply ship arrived. Stevedoring accounted for only 6% of casual earnings in the region in 1962-63. Casual employment is of course available only at the settlements, and due to the concentration of government activity at Coppermine, casual labour earnings were about twelve times greater than at Holman. The chief employer was the Department of Public Works, followed by Northern Affairs, but both missions were engaged in construction programmes during the year, and also contributed to the total payroll. Most families at Coppermine and at Holman augmented their income to some degree by casual earnings, while most families living in the satellite camps did not. Some men from the camps, however, spent a few days or weeks in Coppermine in the summer in order to take advantage of such job opportunities, particularly stevedoring.

Clearly casual labour is almost exclusively a summer pursuit. In the past it has been an important source of cash income at this time, when fox trapping could not be engaged in. The relationship between casual labour and summer sealing still needs to be established. Quite possibly there were individuals in the summer of 1963, and almost certainly in 1964, who considered it more worth their while to hunt seals than to work for wages. A Holman man was reputed to have shot twenty-five seals in one night in July, 1963. Assuming twenty of these were saleable, he could have made about $400 at the then current prices. Admittedly the time involved in preparation of the skins must also be considered, but part of this job is the wife's. Clearly, in this case, seal hunting was more profitable (and, for the Eskimo, more fun), than carrying lumber or hammering nails.

Casual earnings have increased greatly in recent years, although it is not known how typical the 1962-63 figure is. Such earnings were the largest single source of revenue to Coppermine settlement and to the region as a whole, in 1962-63. The health of this aspect of the economy is therefore of some concern. The maintenance of such a figure will require continued expansion and construction. Such programmes as the construction of a school at Holman, and the expansion of the one at Coppermine, which have been proposed, serve this purpose. Expansion, however, cannot be taken for granted, particularly in an area such as this with a questionable economic base. Recent years have been marked by a spate of construction, but this cannot continue indefinitely.

Handicrafts

Several types of crafts are produced in the region. At Coppermine, soapstone carvings are the most important, followed by skin clothing. At Holman, the specialty is inlaid sealskin rugs. Prints are also being experimented with.

Formerly crafts were sold on an individual basis to the Hudson's Bay Company or to tourists. Co-operatives were founded at Coppermine and Holman in 1960 and 1961, respectively, with the assistance of the Department of Northern Affairs. At present, all producers are encouraged to sell their crafts to the co-operatives, which then market the crafts. At Coppermine, there is a standard 40% mark-up, of which 10% is paid out to producers in the form of dividends, on a pro-rata basis. A small tag is affixed to the product, which authenticates it as Eskimo art. Crafts are then sent to brokers or dealers in such places as Yellowknife and Edmonton to be marketed, except in summer, when a stock is kept on hand for sale to tourists.

The co-operatives also collect raw materials. Soapstone is found near Tree River and at Fish Bay in Minto Inlet, and these sites supply Coppermine and Holman respectively. The R.C. Mission boat at Holman is taken periodically to Fish Bay to supply the settlement, while at Coppermine, stone has been hauled on behalf of the co-operative by any method which happens to be convenient and available, be it boat, dogsled or airplane. Only small amounts of stone are required and transportation does not pose serious problems.

At Holman, the sealskin crafts industry has declined with the rise in seal prices, and in the summer of 1963, the co-op had no sealskin crafts of any kind in stock.

It is to the credit of the co-operatives that they have led both to an increased market for crafts, and to higher prices for the producers. They are co-operatives, however, only in the sense that most of the Eskimos buy shares in them and are thus entitled to the 10% dividend on their produce. In fact the administrative work and policy decisions rest almost entirely on the shoulders of the whitemen who operate them; that is, the school principal at Coppermine and the priest at Holman. This is solely because, of the entire membership, there is not a single Eskimo with both the skills, education, and inclination to run the co-operatives.

While the position of handicrafts producers has been improved, it must be remembered that most Eskimos are not first-class craftsmen, just as most Canadians or any other group of people are not. It should therefore not be surprising that income from crafts is only 7.5% of total regional income. Only six families earn more than $500 from the sale of crafts; none earn over $1000. Only three families received more cash from crafts than from any other source, and even in these cases, this amount was less than 50% of the total income.

Unearned Income

Social Security Payments

Social security payments amount to almost 18% of regional income, and are a vital source of purchasing power to many families. Payments consist primarily of family allowance and old age pensions. Every family in Canada is entitled to $6 per month for every dependent child between ten and sixteen. Old age pensioners (age seventy and over), receive $65 monthly in the N.W.T. People over 65 are entitled to old age assistance if they can show need, and receive the same amount as an old age pensioner. One individual in Coppermine receives a disability pension for the same amount. Community income from such payments varies only with population, and for our purposes may be considered as a non-variable, unlike other sources of income.

Relief

In 1962-63 relief payments totaled $33,435, or almost 19% of total regional income. Because relief is such an important component of purchasing power, its distribution has become a useful index of the state of the economy, which varies from place to place, and over time. Some aspects of relief payments are shown in Table 18 and in Figure 5. In examining relief payments for the three separate segments of the study area, certain aspects may be noted as common to all three. For instance, in each case, about ninety percent of all families receive some relief during the year. Figure 5 shows a definite trend in all cases of low relief payments in late summer and fall, and high payments in late winter and spring. The slightly earlier peak at Holman is probably explained by the fact that fuel forms a large part of the relief issue there; this peak corresponds with the coldest months.

TABLE 18.--Relief payments, June 1st, 1962 - May 31st, 1963

	Coppermine (settlement only)	Coppermine trading area ex. Coppermine	Holman and trading area
1. Total relief payments(rounded to nearest dollar)	$18,533.00	$4,883.00	10,019.00
2. Average monthly relief	1,554.42	406.92	834.91
3. Number of families receiving relief at some time during year, and percent of total	54 (91.5%)	18 (90.0%)	20 (86.9%)
4. Average relief per family per year*	314.12	224.15	435.61
5. Median relief per family per year*	277.00	241.00	128.00
6. Average relief per family per month*	26.18	20.35	36.30
7. Number of months during which average family receives relief	5.17	2.90	5.43
8. Average number of families on relief during any one month, and percent of total	25.4(43.1%)	4.8 (24.0%)	10.4 (45.2%)

9. Percentage of families on relief by number of months.

Months	0	1	2	3	4	5	6	7	8	9	10	11	12
Coppermine	8.5	10.2	5.1	16.9	8.5	20.3	1.7	1.7	3.4	1.7	8.5	1.7	11.9
Coppermine area	10.0	10.0	10.0	45.0	15.0	0.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0
Holman & area	13.0	8.7	13.0	8.7	13.0	8.7	0.0	0.0	0.0	0.0	0.0	4.3	26.0

10. Percentage of families on relief by calendar months.

Month	J	J	A	S	O	N	D	J	F	M	A	M
Coppermine	33.9	28.8	28.8	27.1	25.4	27.1	45.8	59.3	52.5	69.5	61.0	57.6
Coppermine area	15.0	5.0	0.0	10.0	0.0	5.0	10.0	35.0	50.0	45.0	70.0	45.0
Holman & area	43.4	34.7	30.4	30.4	34.7	30.4	34.7	73.9	73.9	73.9	39.1	43.4

11. Percentage of families receiving specified amounts of relief

Amount	$0-99	$100-299	$300-499	$500-999	$1000-1499	$1500+
Coppermine	25.4	30.5	25.4	16.9	1.7	0.0
Coppermine area	20.0	45.0	25.0	10.0	0.0	0.0
Holman & area	43.4	21.7	8.7	0.0	21.7	4.3

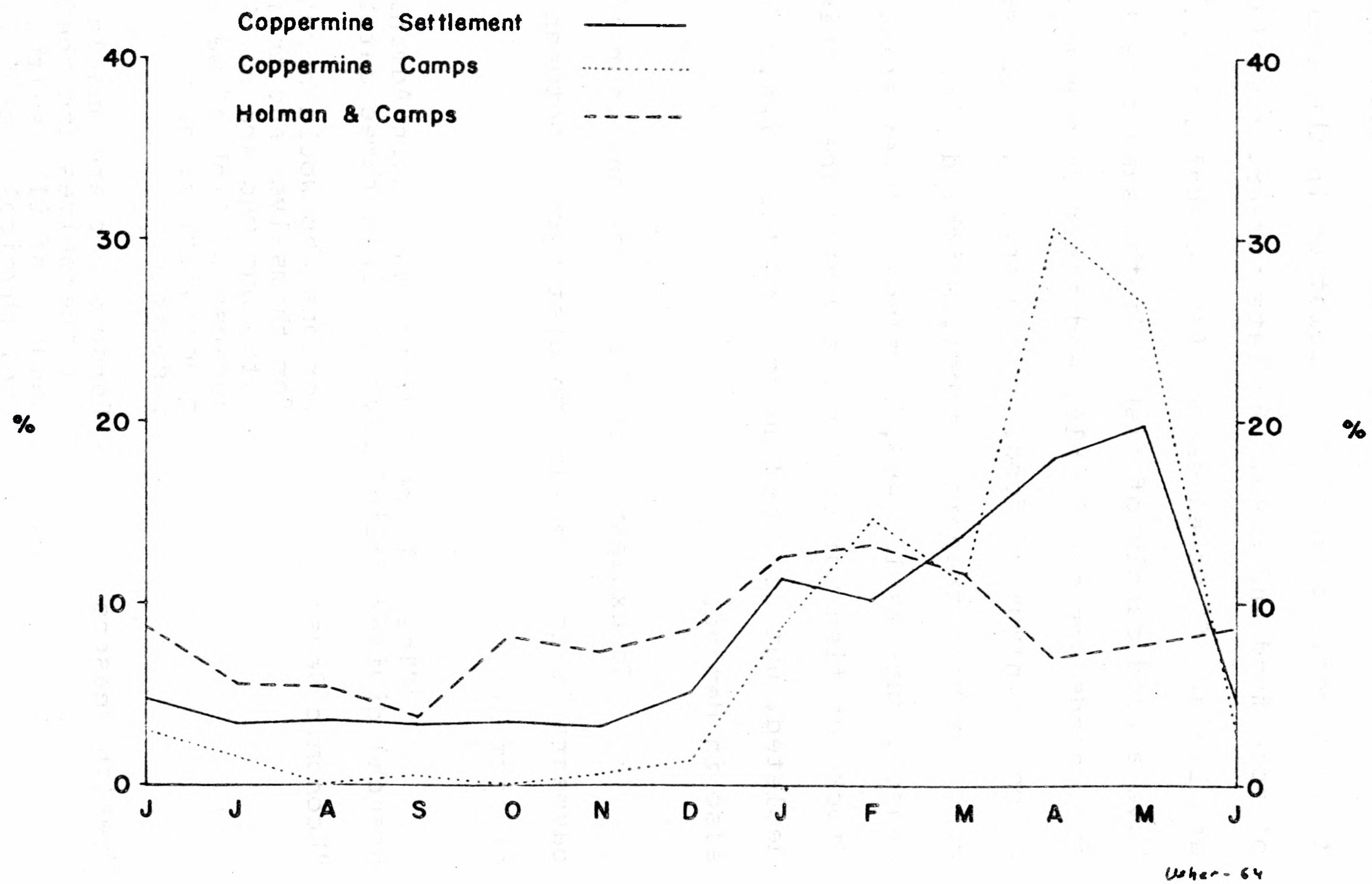
* Based on total number of families in area considered.

Source: Records of the area administrator, Coppermine.

Figure 5

PERCENT of TOTAL ANNUAL RELIEF ISSUED EACH MONTH

JUNE 1, 1962 - MAY 31, 1963



Section 10 of Table 18 not unexpectedly shows the same trends. Variation of relief payments during the year is probably the most significant indicator, and appears to be a reflection of the variation in the availability of both food and cash. By late summer, most families are living off wages earned from casual labour, and have a good supply of fish. At the same time their fuel needs are negligible, and their dogs are getting by on a minimum of food. By spring, the only source of cash has been trapping income, which, during a poor season, such as 1962-63, is almost non-existent. Stocks of fish put up for the winter are by this time depleted, but dog food needs are still high. Fuel is also in demand.

To explain regional variations in relief payments it is necessary to distinguish between types of payments.

"The Welfare Division (Northern Administration Branch) divides relief payments into three categories:-

"Economic Reasons - Persons who would normally provide for themselves and their dependents, but who are unable to do so because of lack of wage employment opportunities, or poor game resources.

"Health Reasons - Persons who are unable to provide for themselves and their dependents because of ill health, advanced age, physical disability, or mental incompetence.

"Dependent Children - These payments are made to mothers whose minor children live with them, and who cannot provide for themselves and their children because the husband is permanently absent from their home. Included in this group are widowed, and divorced or unmarried mothers whose minor children are living with them."[5]

Families on relief of types two and three receive money continuously, and monthly payments are substantial. At Holman, six families receive just over eighty percent of the relief issued there, and are also dependent for twelve months of the year. These families are the ones without able-bodied men, and four of them are the families of widows with young children. This situation clearly upsets the averages noted in sections 2,4,6,7 and 8 of Table 18. Median annual relief is in this case a superior index.

A reverse situation is found in the outlying camps of the Coppermine area, where payments of types two and three are negligible. Only families with able-bodied men live in these outlying camps; for if one cannot hunt, no purpose is served by moving away from the settlement; indeed, dependent families are tied to the services available in the settlement. Relief in the outlying areas is almost entirely of type one (note the

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[5]G.Abrahamson et. al., 1964, op.cit., p.61.

close correlation between median and annual relief per family). For this reason it is much lower than that at Holman, and the seasonal variation much more marked. Another reason for extreme seasonal variation is of course that to obtain relief, these individuals must come to the settlement. This is not a problem for those who live within a few hours travelling of it, but more distant persons only make the trip a few times a year. Everyone comes in at Easter, and as this coincides with the period of greatest need, April is thus the month in which the most relief is issued.

At Coppermine, although there are a few dependent families, most relief is issued for economic reasons. It is most common for a family to be on relief from three to five months of the year, and to receive between $100 and $500.

It is interesting to note what relief money is spent on. This will be discussed in more detail below (see Table 25), but it may be pointed out here that individuals from outlying camps tend to spend their relief payments on hunting and trapping gear, while Coppermine recipients purchase food, clothing and fuel, primarily. In short, the outlying people are more self-sufficient in terms of food and clothing, but due to lower cash income may not always be able to maintain their stock of capital equipment.

Relief has been the subject of considerable controversy in the north, and it is not proposed to review or indulge in that controversy here. We have noted that the outlook for expansion in either food or earned income is not good. The people must, however, continue to live, and without a radical change in their economic prospects, the conclusion that rapid increase in relief payments will continue in coming years is inescapable.

Total Income

Figure 6 shows the relative importance of the separate sources of cash income. Variations in the size of these sources reflect the different ways of life in the separate regions. The earned income components show the importance of wage labour at Coppermine, and of trapping in the outlying camps and at Holman. Handicrafts are everywhere a minor income source. Unearned income components vary inversely with per family cash incomes.

TABLE 19.--Total Cash Income, 1962-63

	Total	average per family	median per family
Coppermine	$119,481	$2025	$1663
Coppermine camps	17,047	852	815
Holman & Camps	42,561	1850	1652
Total region	179,089	1756	1509

Table 19 and Figure 7 show income distribution. One need only recall that median annual wage earnings in Canada amounted to \$3104 in 1962[6] to see that the Eskimos of this region are on the economic fringe of Canadian society. The difference between Eskimo and Canadian median earnings are even greater than the above figure would suggest, for the all-Canada figure does not include unearned income, and the wage earner's income is divided among fewer people than is the case in the average Eskimo family. The Eskimo, however, has an important source of income which is not generally available to the wage earner in the south. That source is the produce of his hunting, which can supply him to a greater or lesser degree with food, clothing and fuel. Of these, food is by far the most important.

We note variations of cash income levels from place to place within the study area, but this is only a part of the situation. We must now turn to the following questions: Can we assign cash values to country produce? What is the total value of country produce? Does the addition of country produce to cash income tend to diminish or accentuate regional income differences?

There are no universally applicable values to country food. In order to assign such values, several criteria must be considered. Eskimos in the region seldom

[6] Canada, Dominion Bureau of Statistics, Canada 1963, Ottawa, 1963, p.92.

Figure 6

SOURCES of CASH INCOME, by AREA

COPPERMINE - HOLMAN REGION

1/6/62 - 31/5/63

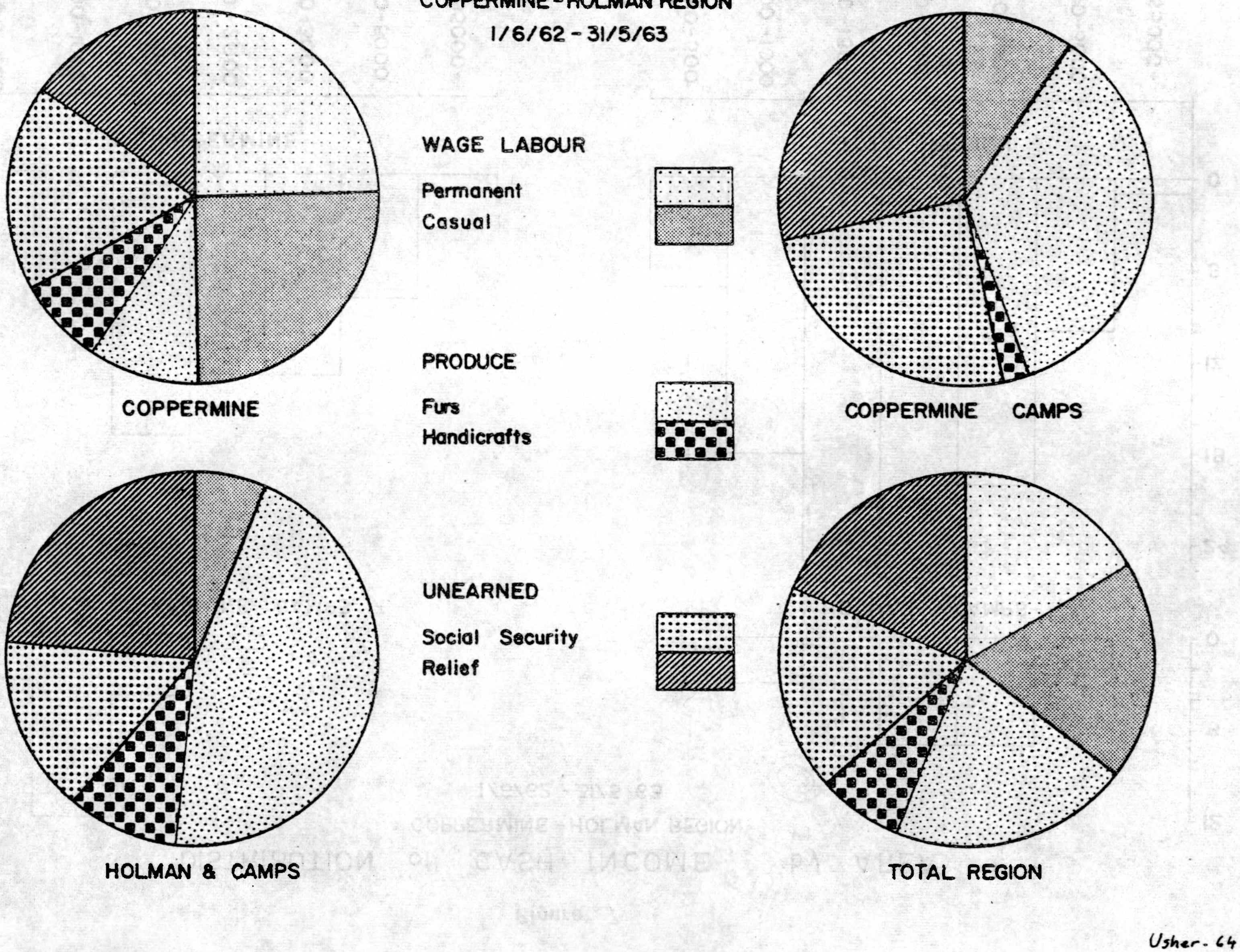
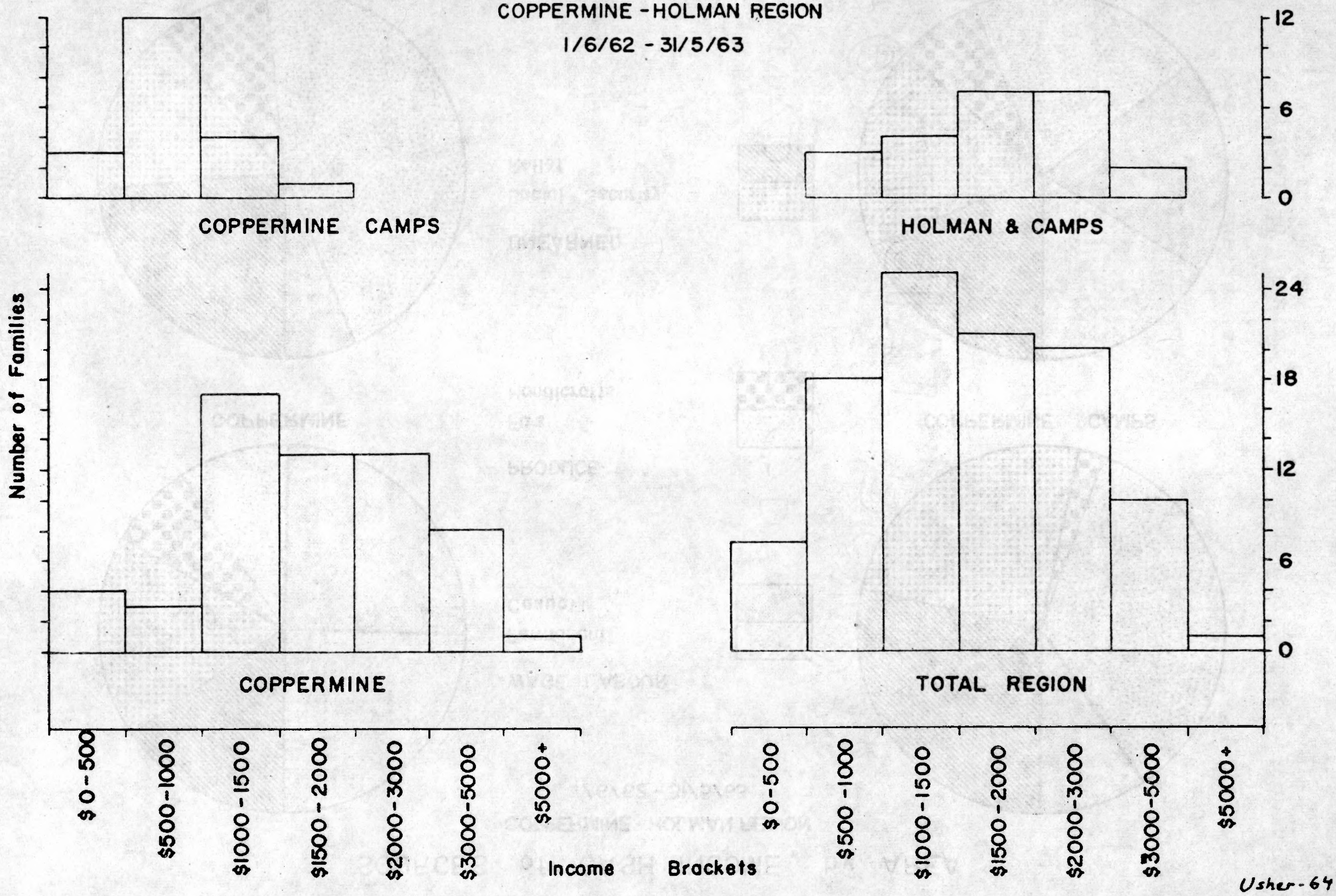


Figure 7

DISTRIBUTION of CASH INCOME, by AREA

COPPERMINE - HOLMAN REGION

1/6/62 - 31/5/63



buy or sell country food among themselves. When an individual parts with food he has obtained, he rarely sells it but rather shares it, or gives it away. The lines of distribution, that is whether sharing is on a kinship, partnership or some other basis, is not known. However, several Eskimos state that cash exchange does occur occasionally, and have quoted prices for certain commodities, although informants disagree on these prices. Such prices are one of the indeces which can be used here.

Value of country produce could also be expressed in terms of what the Eskimo might get for it if he sold it on a commercial basis. Another criterion could be the cost of purchasing similar food from the local store. For example, the value of a dog's daily ration of fish could be seen as the cost of a similar ration of dog meal. The disadvantage of this method is that the value of this amount of fish will vary according to its use either as dogfood or human food, for the necessary substitutions a human would have to make are more expensive than dog meal.

The following table indicates country food values according to the three methods noted above, that is: 1. Exchange values used at times by Eskimos. 2. Prices paid to producers on a commercial basis (only char has been marketed commercially, and the example given here is taken from the Ferguson River fishery near

Cambridge Bay). 3. Cost of substitute commodities. Arbitrarily, fish and seal are expressed in terms of dogfood costs, while caribou is expressed in human food costs. The conversion to dogfood requirements is based on the assumption that the daily requirements of a dog during the peak feeding period are 1 1/2 lbs. of meal (dry weight) and one half pound of lard. Daily summer requirements are taken as two-sevenths of this quantity. Estimation of caribou value on this basis is rough, being the estimated cost of groceries to feed the same number of people for the same length of time.

TABLE 20.--Estimated Values of Country food

	1	2	3
Fish/lb.(round weight)	$.10-.15	c.$.15	c.$.12
Seal/lb.(edible weight)	.11-.20	--	c.15
Caribou/lb.(edible weight)	.15-.33	--	c.25

The three methods are in broad agreement with one another. It is proposed here to use the results of the third method, with the reservation that they are only approximations based on a tentative theory. Using these figures, we may calculate the 1962-63 food income in dollar values at Coppermine, arbitrarily assigning a value of ten cents per pound to the minor food sources.

TABLE 21.--Value of country food harvested by Coppermine residents, 1962-63

Fish	$ 19,200
Seal	7,613
Caribou	9,375
Other	2,747
Total	38,935

This figure, amounting to almost $700 per family, would raise real community income to a total of $158,416. Unfortunately, we do not have complete data on harvests for the outlying camps, or for Holman, but rough approximations can be made, as follows:

TABLE 22.--Value of country food harvested at outlying camps and at Holman, 1962-63

	Coppermine Camps	Holman and Camps
Fish	$12,000	$4,800
Seal	3,150	9,975
Caribou	1,875	2,813
Other	1,428	1,419
Total	18,453	19,007

To these totals, the estimated value of seal oil consumed could also be added. Presumably seal oil is not as efficient a fuel as is commercial heating oil, and therefore an arbitrary value of fifty cents per gallon will be assigned to it.

Only nine families reported using seal oil at Coppermine, and then only in conjunction with other fuels. Probably not more than a thousand gallons were consumed in all, which would amount to about $500. Seal oil is much more widely used in the outlying camps, and may have amounted to about $1500 worth, although this is an extremely rough estimate. At Holman, ten families used seal oil exclusively, and the average consumption per family was about six drums, or 270 gallons. Adding the amount used by families at the camps in Minto Inlet and Berkeley Point, probably about $1500 worth of seal oil was consumed in the Holman region.

Clothing should also be included in the value of country produce, but present information does not allow estimation of its value. As relatively little skin clothing is used nowadays, the exclusion of this value should not significantly alter the values already arrived at.

Total income, as now estimated, is presented Table 23 and Figure 8. As one might have expected, the importance of wage labour at Coppermine is reflected in the relatively low proportion of food in the total income. In the satellite camps, very low cash income is partly offset by higher production of country food, and at Holman, food income

Figure 8

SOURCES of TOTAL INCOME, by AREA

COPPERMINE-HOLMAN REGION
1/6/62-31/5/63

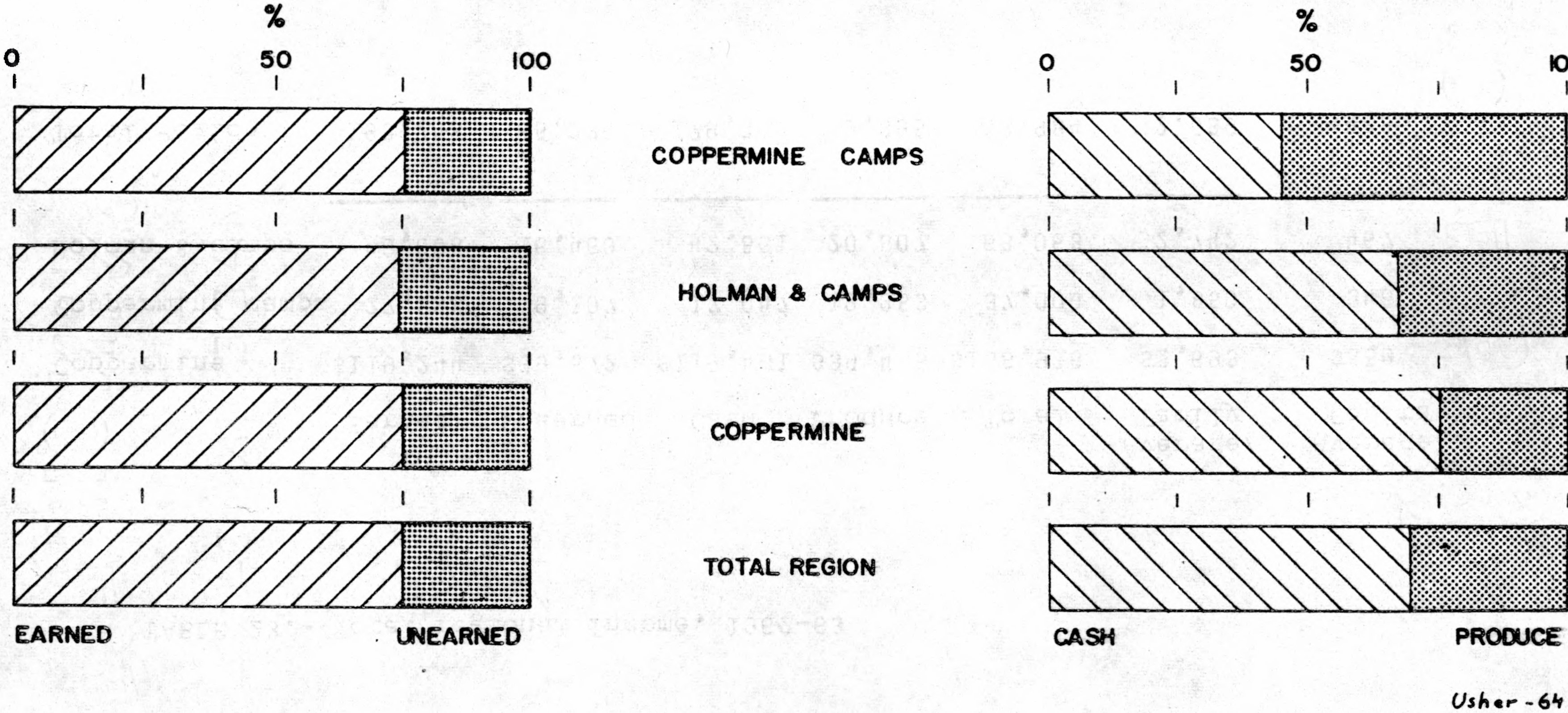


TABLE 23.--Total regional Income, 1962-63

	Earned	Unearned	Cash	Produce	Total	Average/ Family	Average/ Capita
Coppermine	$119,244	$39,672	$119,481	$39,435	$158,916	$2,693	$550
Coppermine camps	27,893	9,107	17,047	19,953	37,000	1,850	346
Holman & camps	46,608	16,460	42,561	20,507	63,068	2,742	467
Total Region	193,745	65,239	179,089	79,895	258,984	2,539	488

is also more important. Food production amounts to slightly under $700 per family at Coppermine, about $900 at Holman, and $1000 per family in the outlying camps of Coppermine. The percentage of unearned income is now seen to vary only slightly from place to place, so that people living off the land appear no better off in this respect than those living in the settlements. Regional per capita income is now shown to be about 28 percent, or little better than one quarter, of the $1734 per capita income enjoyed by the average Canadian.

While food is an important component of income, and cannot be neglected in discussing income, it must also be recognized that a certain amount of cash is vital to the needs of every family, and no amount of food can replace it. To understand the need for cash, we must investigate expenditures, and capital requirements, and it is to these questions that the following section is devoted.

EXPENDITURES AND REQUIREMENTS

Expenditures

Eskimo spending in the region is primarily on necessities. The average family requires several categories of goods to maintain themselves, and the relative proportions of these goods depends on their income, and the occupation of the family head. These categories are capital equipment, groceries, clothing and fuel. Luxury spending appears to be only a small part of the total. Expenditures are almost exclusively on goods. Because there is essentially no division of labour among the Eskimos, there are no services offered.

Regional cash income, which amounted to almost $180,000 in 1962-63, was spent almost entirely within the area. Mail orders probably amount to less than $1000. The Eskimo seldom has much cash at any one time, and there is very little saving. Most people have accounts at the Bay store, rather than keeping ready cash. Usually, when an individual receives a pay cheque, or trades a quantity of fur, the money is spent immediately at the store, so that few people have large credits outstanding. One individual at Coppermine is understood to bank in Yellowknife. Gambling is common in the region, and the volume of goods and cash transferred by means of it appears to be considerable. Discussion of this phenomenon in detail is not within the competence of this thesis. In any case, this circulation is exclusively intra-regional, and therefore does not affect the total purchasing power of the study area.

Table 24 shows relief spending in the region from November 1962 to April 1963.

TABLE 24.--Monthly average of relief expenditures by type, Coppermine - Holman region, November 1962-April 1963

	Groceries	Clothing	Fuel	Other	Total	Families receiving
Health	$434	$49	$68	$6	$557	49
Dependent Children	564	56	405	6	1031	46
Economic	1302	155	293	515	2095	141
Total	2300	260	766	527	3683	236

Source: Records of Area Administrator, Coppermine.

Table 25 presents examples of relief spending by three families with different earning abilities, occupations, and requirements, during the month of April, 1963. Family number one is that of a widow on full relief, with dependent children. The head of family number two is an able bodied man living in Coppermine permanently, but with no steady wage work. The head of family number three is a trapper and hunter from one of the satellite camps of Coppermine, living primarily off the land. The families were chosen at random within these groupings. Groceries have been divided into staples and non-staples on an arbitrary basis. Staples include such items as flour, sugar, tea, etc. which an Eskimo would now buy even if he obtained sufficient country food.

The relative dependence on staple versus non-staple foods is most revealing, for, as we might expect, the purchase of non-staples is in inverse proportion to

TABLE 25.--Breakdown of relief expenditures of three families, April 1963

Family	Staples	Non-staples	Tobacco	Clothing	Fuel	Capital Equipment
1	$57.76	$97.55	$4.34	--	$5.50	--
2	36.33	42.40	--	12.18	5.50	--
3	42.19	27.92	8.66	--	5.50	50.00

Family	Ammunition	Other	Total
1	--	$5.25	$170.40
2	--	.46	96.87
3	45.95	--	180.22

Source: Records of the Hudson's Bay Company, Coppermine.

dependence upon country food. Also of interest is the proportion of family number three's relief devoted to capital equipment and ammunition. It is indicative of a need for relief despite success in obtaining country food. This would be especially true in such a poor fox trapping season as 1962-63. The total allotment represents a significant portion of this family's annual relief, as the individual in question seldom visits the settlement.

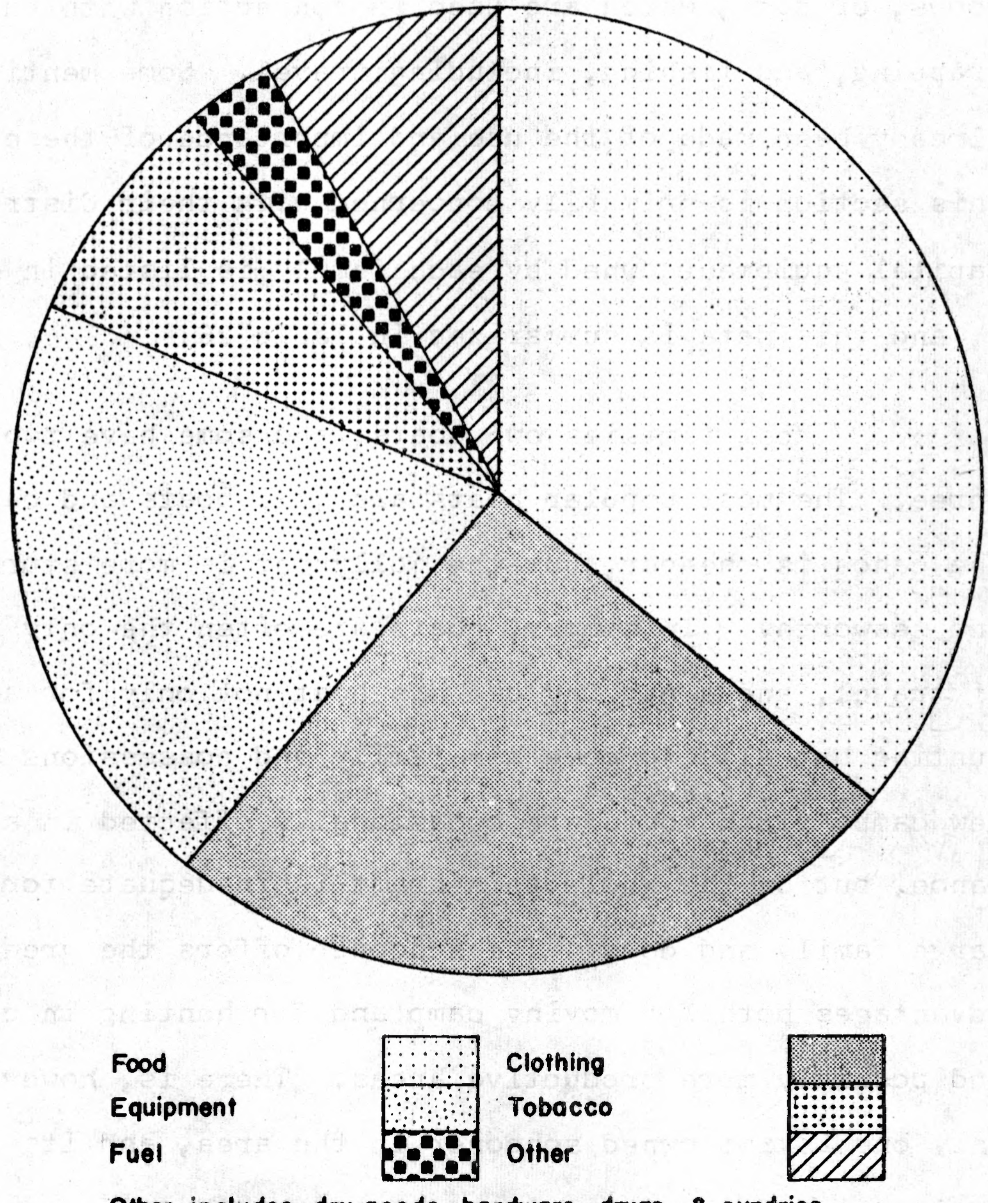
Figure 9 represents a percentage breakdown of Eskimo expenditure over eleven months during 1961-62 at Cape Parry, west of the present study area. Cape Parry is about the same size as Holman, and as the writer believes spending patterns to be broadly similar at the two places, the information is included as a further elucidation of these

Figure 9

DISTRIBUTION of EXPENDITURES

CAPE PARRY, N.W.T.

1/8/61 - 30/6/62



Other includes dry goods, hardware, drugs, & sundries

Source: J. Stevenson, mgr., H.B.C. post, Cape Parry, N.W.T.

Usher-64

patterns.

Capital Equipment

Capital equipment is defined here as all durable goods, or dogs, which are used in connection with hunting, trapping, and fishing, including travel. Some mention has already been made of the use and importance of these items; this section is primarily concerned with their distribution. Capital equipment owned by each family is listed in Appendix E, and this data is summarized in Table 26.

Most families own boats, and some have two or three. The most popular boats are jollyboats and canoes. The canoe is cheaper, but the jollyboat is more sturdy and seaworthy. In summer, boats are often the only means of travel, and a man may use his boat not only for seal hunting but also to move his family and possessions to a new camp. Such moves are occasionally effected in a small canoe, but on the whole this craft is inadequate for a large family and dogs. The schooner offers the greatest advantages both for moving camp and for hunting in distant and possibly more productive areas. There is, however, only one Eskimo owned schooner in the area, and its engine is in need of repairs. Speed boats are becoming popular, possibly as some sort of status symbol, as they are no more efficient for hunting than other less expensive craft,

TABLE 26.--Summary of distribution of capital equipment, July 1,1963.

	Coppermine	Coppermine[a] Camps	Holman & Camps
Total Families	51	22	23
Families with able-bodied men[b]	43	22	19
Able bodied men[b]	51	30	31
Boats			
Families owning boats	36	20	19
Number of boats	39	28	23
Most common boats	canoe jollyboat	jollyboat canoe	jollyboat freight canoe
Boat Motors			
Families owning motors	29	21	17
Number of motors	35	28	21
Most common power	10 HP, 5 1/2 HP	10 HP, 5 1/2 HP	5 1/2 HP, 10 HP
Motor sleds			
Families owning motorsleds	8	1	0
Number of motor sleds	8	2	0
Dogs			
Families owning dogs	38	21	21
Number of dog teams	36	30	27
Number of dogs	302	240	259
Traps			
Families owning traps	28	20	17
Number of traps	2465	3705	4745
Ave. number of traps per family	88	185	279
Number of families owning 300 or more traps	2	5	8

TABLE 26.--(cont.)

	Coppermine	Coppermine[a] Camps	Holman & Camps
Seal hooks			
Families owning seal hooks	25	17	18
Number of seal hooks	316	260	163
Fire-arms			
Families owning fire-arms	47	22	22
Number of fire-arms	118	85	96
Number of families owning 3 or more fire-arms	21	16	18
Three most common fire-arms	.22	.22	.22
	..30-30	.30-30	.270
	.222	16g.	12g.

Notes: [a]Excludes four families for whom data was not obtained.

[b]All men between the ages of 15 and 60 except those in Camsell Hospital, Edmonton.

and their high consumption of gasolene increases their operating costs. Their owners apparently derive considerable enjoyment from these boats, however, and they may frequently be seen cruising around in front of the settlement. Boats are for the most part kept in good repair, although many teenage boys delight in practices not in keeping with proper boat maintenance, such as ramming them on beaches.

Not every family that owns a boat has a motor for it, although it must be said that individual ownership of boats and motors is rather flexible as these are common gambling stakes. A few families were found to possess an outboard motor but no boat, which almost certainly was a temporary situation. Outboard motor ownership has risen sharply in the last decade or so. The Anglican missionary at Coppermine recalls that only two people had outboards in 1950.[7] Outboards of 5 1/2 or 10 horsepower are the most popular, but a few individuals own 18 horsepower motors, and small inboard motors are also found in the region. Although Eskimos have a reputation of being excellent mechanics, a surprising number of abandoned and rusting motors may be seen strewn around the settlements. There appears to be a tendency to

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[7] Personal communication, Archdeacon J.R. Sperry, Anglican mission, Coppermine, August, 1963.

discard an engine when it breaks down. To what extent this is due to the difficulty of obtaining spare parts is not known, but the practice would seem to indicate a poor understanding of the value of money on the part of the Eskimos.

It is interesting to note that of the ten motor sleds in the region, six were owned by permanently employed individuals, one by a man who had recently worked on the DEW line, and another by an old man who no longer traps or hunts. Motor sleds are expensive, and it appears that it is difficult to obtain sufficient cash to purchase one without a steady job. With such a job, however, the individual has not time to trap or hunt, and the motor sled becomes solely a pleasure vehicle.

Most families depend on dogs for winter travel. The totals given in Table 26 include a few dogs kept as pets (e.g. where a family is listed as having one or two dogs) and some puppies. It appears that only enough puppies are kept to ensure a full team; the rest being put away. However more research on the subject of dog ownership and use is required. Information from local informants suggests the following cash values for dogs: lead dogs - \$50, other dogs - \$40, puppies \$10. The number of dogs per team is probably seven to eight in the Coppermine area and slightly higher at Holman.

The most notable aspect of the distribution of traps and seal hooks is the low proportion of families owning these items at Coppermine. These figures indicate a much higher dependence on hunting and trapping in the outlying camps and at Holman. Even the average number of traps owned by these families is considerably smaller at Coppermine than elsewhere. Further research is necessary in the economics of trapping. It is not known whether there is a critical number of traps a man requires to make trapping worthwhile, and what this number might be; in any case this depends not only on the number of traps, but also upon method of travel and frequency of trapline visits, in addition to many natural factors. Three hundred traps are used here arbitrarily as a minimum for profitable trapping. There are very few families with 300 or more traps, in particular there are only two at Coppermine. A link between this fact and the poor trapping record at Coppermine seems likely. There is even less evidence concerning any critical number of seal hooks, partly because, unlike fox trapping, hooks are only one of several ways to obtain seals. The Eskimos are not noted for careful collection and maintenance of their traps. There is almost certainly a significant loss each year, but what percentage this might be is unknown. This may also be true of seal hooks, but these are usually home-made and therefore represent a time rather than a direct cash investment. About five dollars appears to be the current price, if sold by one individual to another.

Almost every family owns a firearm of some description. Even widows with virtually no other equipment own at least one rifle. The .22 calibre rifle is by far the most common, and it is adequate for seal hunting, although at Coppermine the .222 has become popular for this purpose. Most families have a big game rifle and a shotgun in addition, for caribou and birds respectively. The standard of firearm care and maintenance does not appear to be high although no specific information on the average life of guns was obtained.

Ammunition, although not strictly within the scope of capital goods, is mentioned here because of its association with firearms. Sale of ammunition indicates about the same relative popularity of the various calibres as does ownership, not surprisingly. Ammunition sales during the year under discussion amounted to about $5000 at Coppermine and about $4000 at Holman. At Holman there is a cartridge reloading machine, which is widely used for some calibres. The cost of reloaded cartridges is about half of the cost of new ones. On the whole the Eskimos are not at all conservative in their use of shells. Some individuals are excellent shots, but many men will fire repeatedly at hopelessly impossible targets. This is especially true of summer seal hunting, which, as has been suggested, is an activity engaged in not only for profit but for sport.

No data was obtained on the amount of fishnets in the area, although it was ascertained that almost every family had some. Nets are bought by the bundle, and the individual adds his own floats and sinkers. Probably about two fifty yard nets are the minimum requirement for proper fishing. A hundred yards of net costs about fifty dollars to make. Most people do not appear to have this much net. It was also observed that nets are sometimes poorly cared for, and much of the net used is in need of repair.

The replacement value of all this gear is considerable, as Table 27, based on a hypothetical family owning sufficient gear, indicates. (A comparison of prices of selected items at Coppermine, Holman and Montreal will be found in Appendix F).

The cost of outfitting one's self completely is over $2000, and while no one does so all at once, it is nonetheless remarkable. What workman in Montreal or Winnipeg pays as much for his tools and receives so little for his labour? Unfortunately there is no adequate information on the life of these capital goods, and therefore the annual depreciation cannot be estimated, except to state that the depreciation on the above outfit is almost certainly in the hundreds of dollars. To this

TABLE 27.--Initial cost of a trapping and hunting outfit sufficient for one family

Twenty foot canoe	$530
Ten horsepower outboard motor	400
Eight dogs (includes one lead and one puppy)	300
300 traps, size 1 1/2	375
Ten seal hooks	50
.22 rifle (magazine load)	28
.222 rifle	90
.30-06 rifle	125
12 guage shotgun	83
100 yards fishnet	50
Total	$2031

must be added the expenditures on ammunition, which for an active hunter apparently approaches $200, and other items such as gasolene, oil, dog harnesses, chains, sled runners, etc.

Other expenditures

Food, clothing and fuel are fundamental requirements of the people. Fuel requirements have already been discussed, and we may recall here that fuel prices in the region are several times those in southern Canada. Appendix F indicates that food prices range up to twice those in the south. Some remarks have already been made about patterns of food consumption. Clothing is also slightly more expensive in the north. Thus not only does the Eskimo receive a very small income compared to the national average, but the cost of living also further weakens his purchasing power. Probably one quarter to one third of the Eskimos' cash income is spent in effect on freight charges over and above those normally incurred in southern Canada.

A few comments are in order on clothing, as the trapping economy made the Eskimos at least as dependent upon the traders for clothing as for food. The making of good skin clothing is a painstaking business, and in recent years the Eskimos have preferred to wear "white man's clothing", even when good skins for clothing are available. Unfortunately the white man has not yet invented clothing as admirably suited for winter hunting as skin clothing. One might at least expect that exceptionally fine and warm clothing would be available at the local trading posts, in view of the severe climate. Such, however, is not the case, as only the very lightest parkas appear to be on sale. One may wonder how many times a visit to the trapline was not made because adequate clothing for the journey was not to be had. A possible answer to the clothing problem would be for widows and other unmarried women to set themselves up as clothesmakers, either buying skins or taking them on consignment. Such a programme could provide clothing for the community and cash for these women, many of whom are chronic relief cases.

THE PROBLEM OF CAPITAL

One aspect of the economy not yet discussed is the cost of operating a dog team. According to indeces already noted, the theoretical value of country food required to adequately maintain a seven dog team is about $915 per year. To feed the 800 dogs in the region by the same standards would cost just over $100,000, or about forty percent of total regional income. This would be the major input for trapping and hunting, although another $20-25,000 would have to be added for expenditures on capital equipment and ammunition. The value of country produce was slightly under $80,000 in 1962-63, while trapping income amounted to about $36,000. The implication is, that of the almost fifty percent of regional income derived from hunting and trapping, the same amount or more must be reinvested simply to maintain the same level of income, or in short, that hunting and trapping are not profitable activities, and may even incur deficits. Such a conclusion, based as it is on incomplete evidence for one year only, is of course tentative, and could even be misleading. In 1963-64, trapping income was spectacularly high due to the happy combination of high seal prices and a peak in the white fox cycle. It seems likely that profits from hunting and trapping were indeed very good that year, although in all probability that year was unique. Obviously further research is necessary to show whether hunting and trapping are or are not profitable activities, and an analysis of the problem over a period of several years is required.

In view of the enormous cost of maintaining dogs, it may be advisable to investigate the feasibility of using other forms of transport. There are just over 100 dog teams in the region. All these teams could be replaced by motor sleds (which cost about $1000 locally) with little more than the money required for the annual maintenance of these teams. There are several advantages to motor sleds, the main one being that they cost much less to maintain, because unlike dogs they do not consume fuel when they are not working. Many Eskimos state that they would not now buy motor sleds, because of problems of cold weather operation, the possibility of breakdowns far from the settlements, etc. These however are technicalities which will presumably be rectified in time. Should a very serviceable and reliable machine appear on the market for about $1000, the advantages of owning such machines instead of dogs would be clear, for it is unlikely that the depreciation and maintenance of a motor sled would even approach the $900 required for dogs. At the same time the immense quantity of meat and fish now fed to the dogs would become available for human consumption.

The crux of the problem is, however, that most

Eskimos could not possibly afford them. Although indeed it costs very nearly the price of a new motor sled to feed a dog team for a year, this expenditure is in fact largely in the form of country food. The motor sled, however, must be paid for in cash, and no matter how much the Eskimo obtains by hunting, his produce is inconvertible to cash. Even if the Eskimo were to borrow the cash, he would not necessarily be able to repay the loan, as the motor sled would enable him to acquire primarily more country produce than cash. The only way in which an Eskimo can capitalize himself sufficiently at present is to engage in regular wage work, which is of course incompatible with hunting and trapping, although some individuals have in the past worked on the DEW line and then gone back to hunting with the assistance of the capital they obtained. Ideally, the few available jobs could be rotated, so that every family head receives a chance to capitalize himself. However, not every man is able or willing to take such jobs, nor is everyone who takes a job willing to return to hunting. In addition, the habit of saving is not at all strongly ingrained in the Eskimo character, and there have been many instances where men have earned several thousand dollars on the DEW line only to squander it, or gamble it away, within a few weeks or months.

Another problem of capital at the community level arises from the fact that local enterprise does not re-invest in the communities. The only local enterprises are the posts of the Hudson's Bay Company, and in view of the rather limited turnover of these stores, there may no longer be any profits to speak of. What ever profits these stores do realize, however, are channelled directly out of the north. Consumer co-operatives might possibly be the vehicles by which profits could remain in the north for re-investment in community projects. The problems in establishing a consumer co-operative are of course immense, and careful studies of the feasibility and advisability of such a project would be necessary. While the economic advantages of a consumer co-operative may be slight, more intangible social benefits could indeed accrue to the communities.

CHAPTER VIII

CONCLUSIONS

We have seen how, in an exacting environment, the disruption of primitive hunting methods and of the traditional ecology had a largely deleterious effect on the renewable resource base. This has been aggravated by recent increases in population, which still continue, and by the concentration of families at a few places. The living conditions in most of these settlements or camps are detrimental to the health and welfare of the Eskimos. The land can no longer provide for the needs of the people, and indeed the viability of the present hunting and trapping economy maybe questioned in view of the apparent high ratio of "inputs" to "outputs". Although Eskimo families need no longer fear dire privation, for relief payments will always provide a last resort, the danger exists that, due to economic stagnation, relief may become a major and continuous source of income to all. Such a situation might have serious social and psychological consequences. It would seem that, with the failure of hunting and trapping to provide an adequate standard of life for all, the only way the Eskimo can better his position is to attain sufficient education to engage in skilled jobs. The few individuals who do so, however, return to their communities only to find no opportunity to use their newly acquired skills, and at the same time they are no longer able to participate in the traditional way of life. The transition from a trapping economy to a wage economy has begun, but now hangs virtually arrested in mid-stream. Many families are now dependent on wage labour, and more need to be, but a substantial increase in job opportunities is not forthcoming. The Eskimos require greater purchasing power, which cannot be obtained by the increased production of country food, but without which any increase in country produce may be impossible. There has been a considerable accumulation of "social capital" in the last fifteen years, but as yet there is no basis for a viable economy in which the Eskimos' labour can be rewarded by an adequate standard of living, a sense of worth and pride in achievement. The immediate future does not appear to offer hope for improvement.

Such problems are wide-spread in the Arctic, and it might be supposed that the federal government would be formulating comprehensive solutions for them. While there is not yet an explicit and thorough going government policy for northern development, indications are that oil, gas and mineral exploitation are assumed to be the basis of the future economy of the north. B.G. Sivertz, at the time Director of the Northern Administration Branch of the Dept. of Northern Affairs, placed considerable emphasis on mineral and fuel exploration in a paper given at the Resources for Tomorrow Conference in 1961.[1] R. Gordon Robertson, the former Deputy Minister of the Dept. of Northern Affairs, has stated that:

> ". . . nothing based on the renewable resources of the north with the sole exception of hydro-electric power -- can ever be sufficient in scale to form a substantial economic base or to provide an important addition to the national income of Canada.
>
> ". . . the interesting prospects depend on the non-renewable resources: on mining and on oil and gas."[2]

In view of the very limited known mineral, timber and power resources of the Coppermine - Holman region, the development of non-renewable resources offers little hope for economic improvement in this part of the N.W.T. Clearly, alternate programmes are necessary for those areas which will not benefit from the announced policy of territorial development.

What avenues of development are open to the Coppermine - Holman region? Its major resources are food, fuel, and fine furs. Food and fuel are not available in sufficient quantities to supply the needs of the region, and so these

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[1]B.G. Sivertz, "The North as a Region", in Resources for Tomorrow Conference, Resources for Tomorrow, Conference Background Papers, Vol. 1, Ottawa, 1961, pp. 561-77.

[2]R.G. Robertson, "The Future of the North", North, Vol. 8, no. 2, March-April 1961, p.4

commodities must also be imported. The Eskimos need a cash income in order to purchase such imported necessities as food, fuel, clothing and housing, and in addition require large sums of capital to maintain their stock of equipment necessary for hunting, trapping and fishing. The only local resource which can at present provide them with cash is fine fur. It has been shown that on a regional basis, even furs, wage labour and cottage industries combined do not provide sufficient income to meet their needs. The remainder is made up by social security and relief payments. There is no expectation of significant increases in wage and cottage industry income. There are possibilities for improvement in the renewable resource sector of the economy. However, because hunting and trapping are now usually individual enterprises, these solutions are predicated on capital outlays of a magnitude unavailable to most families. As investment in improved hunting and travelling equipment would result largely in the increased production of goods inconvertible to cash, direct subsidies may be necessary. Investment in this manner is an alternative to continued subsidization in the form of relief payments. Certainly a major reorganization of the renewable resource based sector of the economy would be advantageous. Increased mobility would allow hunters to get away from over-utilized areas and foray into more bountiful but less used parts of the region. The mechanization of travel would reduce the present strain on renewable resources and allow the land to support a greater number of people.

A few really efficient and well equipped hunters and trappers, devoting all their time to their occupations, could probably produce as much food and furs as do all the men of the region at present. This is of course akin to the agricultural situation in southern Canada. Ideally a few efficient producers are preferable to a lot of inefficient ones, but this requires a sufficiently diversified economy to allow a division of labour. In the study area, it is possible that full-time hunters could earn some cash by selling country produce to full-time wage earners. There are, unfortunately, very few full-time wage earners, and at present most hunters and trappers must depend on casual labour in summer to supplement their income.

Together, the resource base, and the wage economy based on services and construction, do not and cannot provide a living for all the people in the region. This problem is compounded by the remarkable rate of population increase, which will certainly offset any foreseeable expansion of economic opportunity. Such a situation is of course not unique to the Coppermine - Holman region, or to the Arctic in general. It is a "depressed area", but the Maritimes, the Gaspe, the Clay Belt, and the Inter-Lake District of Manitoba are also depressed areas. Many countries have depressed areas and indeed some countries are in their entirety poor in opportunity. Various remedies have been tried in such places, with greater or lesser success, but emigration appears to be a universal characteristic of them. Emigration is not without difficulties, but certainly large numbers of people choose it as a solution to their problems. It is a solution which should be seriously investigated for the Coppermine - Holman region and for other Arctic regions like it. Only by emigration of part of the population can the remainder expect the local resources to support them.

Many southern Canadians retain romantic and sentimental notions about the north, and the Eskimos. They feel that the Eskimos have been ruined by the white man, who intruded upon their country and upset their ancient way of life; and hence we are responsible for restoring to them the ability to live decently in their homeland. We do indeed have responsibilities to the Eskimos, no less than to the rest of our fellow men. However, past mistakes cannot always be rectified. There may no longer be any sound basis for the existence of the Eskimo population as a whole in the Arctic. If so, the nation would not be discharging its responsibilities by condemning the Eskimos to a miserable existence on the barren grounds. The writer believes that the old way of life is gone forever, and that it is doubtful if even the Eskimos wish to return to it. There is nothing inherently virtuous about driving a dogsled and eating seal-meat; at least no more so than driving a taxi or managing a bank. Some may regret that so unique and hardy a race should be submerged into Canadian society, but there is probably little to be gained by attempting to prevent it. The urgent problem today is to ensure that these people are not condemned to exist for generations on the margins of our society. Continued research in the problems of habitability and improved resource use in the north is necessary, but much more effort should be directed toward the problems of Eskimo emigration. Here is work for the geographer and the anthropologist: to find an environment in which the Eskimos can successfully become self-sufficient members of Canadian society with a minimum of hardship during resettlement.

Appendix A

Dates of Freeze-up and Break-up at Coppermine and Holman

Break-up is understood to mean the date when the body of water is clear, or that the ice is sufficiently dispersed to allow the movement of small boats without danger. Where two dates are given, the first indicates the date on which the first signs of break-up occur, such as the opening of leads or extensive melting.

Freeze-up is understood to mean the date on which the body of water is completely covered with ice. Where two dates are given, the first indicates the date on which young ice first forms along the shore.

Coppermine

Year	Break-up	Freeze-up
1930	June 8-15	Sept.28-Oct.8
1931	" 7-19	Oct.6-Nov.3
1932	" 4-9	Sept. 1-Oct.15
1933	" 25-28	Oct. 10-25
1934	" 12-23	Sept. 22-27
1935	" 10-18	Oct. 1-15
1936	" 15-22	Sept. 25-30
1937	" 4-10	Oct. 3-15
1938	" 15-22	Oct. 4-15
1939	" 5-17	Sept. 29-Oct.6
1940	" 20-26	Oct. 2-11
1941	" 15-20	Sept. 22-24
1942	" 6-12	Oct. 14-Nov.5
1943	" 8-17	Oct. 18-Nov.24
1944	" 3-11	Oct. 2-22
1945	" 7-20	Sept. 27-Nov.1
1946	" 14-22	Sept. 29-Oct.10
1947	" 17-26	Oct. 6-22
1948	" 4-10	Sept. 28-Oct.15
1949	July 1-5	Sept. 8-Oct.16
1950	June 17-25	Oct. 4-12
1951	" 12-17	Oct. 10-20
1952	" 1-6	Sept. 29-Oct.28
1953	" 11-15	Oct. 12-Nov.7
1954	" 15-19	Oct. 1-15
1955	" 1-9	Sept. 30-Oct.30
1956	" 17-23	Oct. 1-15
1957	" 24-Jul.2	Oct. 4-Nov.1

Appendix A (cont.)

Year	Break-up		Freeze-up	
1958	May 16-Jun.21		Oct. 6-Nov.4	
1959	June 22-30		Sept. 27-Oct.22	
1960	" 14-16		Oct. 10-Oct.28	
1961	" 12-14		Sept. 23-Oct.16	
1962	" 15-15		Oct. 9-Nov.4	
1963	" 11-18		Oct. 24-27	
MEAN	June 11-19		Oct. 2-21	
Earliest	May 16/58	June 6/52	Sept.1/32	Sept.24/41
Latest	July 1/49	July 5/49	Oct.24/63	Nov.24/43

Holman

Year	Break-up		Freeze-up	
1940	July 11		Oct.22	
1941	July 29		Oct. 7	
1942	early July		Oct.30	
1943	July 14		Oct.14	
1944	late June		end Oct.	
1945	July 4		Oct.27	
1946	early July		Nov. 1	
1947	July 23		Oct.17	
1948	early July		Oct.11	
1949	missing		Oct.22	
1950	mid-July		mid-Oct.	
1951	late July		mid-Oct.	
1952	early July		Oct.23	
1953	early July		Oct.21	
1954	early July		Nov.22	
1955	mid-July		Nov. 4	
1956	July 15-miss.		Oct.11-miss.	
1957	missing		Sept.11-miss.	
1958	June 28		Sept.29-miss.	
1959	July 12-24		Oct.1-11	
1960	June 25-29		miss. -Oct.16	
1961	June 22-Jul.7		Oct. 2-5	
1962	June 16-Jul.1		miss. -Nov.1	
1963	June 23-Jul.16		miss. -miss.	
MEAN	early July		Oct.21	
Earliest	June 16/62	June 28/58	Sept.11/57	Oct.5/61
Latest	July 15/56	July 29/41	Oct. 11/56	Nov.22/54

Source: <u>Break-up and Freeze-up Dates of Rivers and Lakes in Canada</u>, Meteorological Branch, Department of Transport, CIR 3156, ICE-2, 30 Jan. 59; and photostat of Met. Branch records, 1956-63.

Appendix B

COPPERMINE

Housing, by families, Jan. 1st, 1963

Family Number	Material	Condition	Area (sq.ft.)	Occupants Adults	Child.	Tot.	Sq.ft./ person	Fuel	Remarks
1	scrap	inad.	144	4	3	7	21	H,G	Shared w. fam. no.3
2	scrap	inad.	80	2	2	4	20	H,W	
4	scrap	inad.	180	2	4	6	30	H	
5	frame[a]	adeq.	160	2	2	4	40	C	
7	scrap	inad.	108	2	3	5	21	H,W,S	
8	scrap	inad.	144	3	4	7	21	H,G	Shared w. fam. no.6
9	scrap	inad.	225	4	2	6	37	H	Shared w. fam. no.47
10	frame	adeq.	384	2	0	2	192	H	
11	scrap	inad.	96	2	4	6	16	H,W,S	
12	scrap	inad.	168	5	3	8	21		Shared w. fam. no.204
13	scrap	inad.	126	2	1	3	42	H,S	
14	scrap	inad.	140	2	6	8	17	H	
15	plywood	inad.	128	2	2	4	32	H,K,S	
16	scrap	inad.	128	3	1	4	32	H	
17	scrap	inad.	216	3	4	7	31	H,W	
18	frame[a]	adeq.	512	2	2	4	128	H	
19	scrap	inad.	80	2	2	4	20	H,W,S	
21	frame[b]	adeq.	320	2	0	2	160	H	
22	scrap	inad.	96	4	2	6	16	G	
23	frame	adeq.	252	1	0	1	252	H,W	
24	frame[a]	adeq.	480	2	5	7	69	H	
25	scrap	inad.	96	2	2	4	24	H,W	
27	scrap	inad.	216	3	7	10	22	H,W	
28	scrap	inad.	80	3	3	6	13	W,S	
29	scrap	inad.	256	2	3	5	51	H,W,S	
30	scrap	inad.	120	3	1	4	30	H,W	Shared w. fam. no.106
31	scrap	inad.	80	1	2	3	27	H	

Appendix B (cont.)

Family Number	Material	Condition	Area (sq.ft.)	Occupants Adults	Child.	Tot.	Sq.ft./ person	Fuel	Remarks
34	scrap	inad.	160	5	5	10	16	H,W	Shared w. fam.no.104
35	wood	inad.	140	3	1	4	37	H	
36	frame[b]	adeq.	320	2	0	2	160	H	
38	frame[a]	adeq.	512	5	4	9	57	H	
40	frame[a]	adeq.	280	3	3	6	47	H	
41	scrap	inad.	144	2	4	6	24	W.S	
42	scrap	inad.	96	3	6	9	11	H,W	
43	scrap	inad.	180	2	4	6	30		
45	scrap	inad.	128	4	2	6	21	H	Shared w. fam. no.201
46	scrap	inad.	180	3	2	5	36		
48	scrap	inad.	108	2	3	5	21	H,W,S	
49	scrap	inad.	108	3	3	6	18	H,G	
103	scrap	inad.	128	3	2	5	26	H	
105	scrap	inad.	168	2	4	6	28		
108	scrap	inad.	96	4	0	4	24	H,W	
109	scrap	adeq.	168	1	0	1	168		
111	scrap	inad.	168	5	3	8	21		Shared w. fam. no.26
113	scrap	inad.	144	4	1	5	29		
121	wood	inad.	108	2	1	3	36		
202	scrap	inad.	91	3	4	7	13		Shared w. fam. no.37
203	scrap	inad.	120	4	5	9	13		Shared w. fam. no.110
Unoccupied housing:									
a	scrap	inad.	96						
b	plywood	inad.	192						
c	scrap	inad.	120						
d	scrap	inad.	120						

[a]rented.
[b]welfare.

H - heating oil
W - wood
S - seal oil

G - gasolene
K - kerosene
C - coal

Appendix B (cont.)

HOLMAN

Housing, by families, Jan. 1st, 1963

Family Number	Material	Condition	Area (sq.ft.)	Occupants Adults	Occupants Child.	Occupants Tot.	Sq.ft./ person	Fuel	Remarks
1	prefab	adeq.	288	1	4	5	58	H	
3	plywood	inad.	168	2	3	5	34	S	
4	scrap	inad.	180	2	6	8	22	S	
5	scrap	inad.	120	4	1	5	24	S	
6	prefab	inad.	288	4	5	9	32	H	
8	prefab	adeq.	288	6	1	7	41	H	
9	plywood	inad.	120	2	5	7	17	S	
10	frame	adeq.	320	2	3	5	64	H,S	
11	prefab	inad.	288	5	3	8	36	H	Shared w. fam.no.2
12	prefab	adeq.	288	2	1	3	96	H	
13	scrap	inad.	112	3	1	4	28	S	Shared w. fam.no.7
14	scrap	inad.	120	3	4	7	17	S	
15	scrap	inad.	192	2	2	4	43	S	
16	plywood	inad.	225	3	4	7	32	S	
17	prefab	adeq.	288	1	2	3	96	H	
18	plywood	inad.	192	2	6	8	24	S	
19	prefab	adeq.	288	4	2	6	48	H	
20	scrap	inad.	150	4	5	9	17	S	

H - heating oil

S - seal oil

Appendix C

Sources of Fur and Game Totals

From the Game Management Service, Government of the Northwest Territories, Fort Smith, N.W.T.

Northwest Game Ordinance Returns:

1. General Hunting Licence Returns - July 1 - June 30.

   When each hunter returns his licence (if he does so), he must record to the best of his memory all game he took during the year. It is thus quite unreliable, but is the only source for other than fine fur-bearers. Since the Trader's Fur Record Book (see below) was introduced in 1961, only big game (caribou, bear, etc.) has been recorded on the G.H.L. Returns.

2. Trading and Trafficking Licence Returns - July -June 30.

   When each trader turns in his licence, he must record on the back all furs purchased during the year. This should and generally does correspond exactly to the Trader's Fur Record Book (see below).

Trader's Fur Record Book - July 1 - June 30. (Records begin July 1, 1961.)

This is the most accurate available record of all furs purchased from individuals by all traders operating <u>within</u> the Territories. From it may be extracted the numbers of furs traded each month, and the numbers of furs traded by each individual in the settlement. The average price per pelt for each species by month, is also recorded but this information is strictly confidential, and cannot be published.

Fur Export Tax Returns - Nov. 1- Oct. 31. (actually covers the period July 1 - June 30.)

This is an accurate record of all furs <u>leaving</u> the Territories, regardless of destination or purchaser. (See schedule of tax payable on furs exported from the N.W.T., p.74 in <u>Game Laws, Northwest Territories, Canada</u>, Ottawa, 1963.) There may be a lag between time of purchase of a fur and its actual export, e.g. a slight carry-over from one year to the

Appendix C (cont.)

next.

N.B. Because no trappers in the Coppermine - Holman region ship furs directly to brokers outside the Territories, the Trader's Fur Record Book is the most suitable source of data.

From Ottawa:

Sources in Ottawa, while not as complete as those in Fort Smith, can be useful, particularly in the analysis of big game hunting. Information may be found in the current files of the Northern Administration Branch of the Department of Northern Affairs and National Resources, and in the annual Detachment Reports of the R.C.M. Police.

Appendix D

Cash Income By Family
June 1, 1962 - May 31, 1963

COPPERMINE TRADING AREA

Coppermine

Family Number	Employment Permanent	Employment Casual	Fur[a] '61-'62[b]	Fur[a] '62-'63	Handi-crafts	Social Legislation	Relief	Total Income
1				94	977	780	499	2,350
2		336		68	11	972	522	1,909
3		134	(140)	441	414	216	303	1,508
4	3,305			471	726	336		4,838
5		490	(269)	722	166	168	229	1,775
6		257		430				687
7		1,678	(49)	338	9	216	198	2,439
8		512	(70)	262	94	96	286	1,250
9				171	211	96	841	1,319
10		142		47	22	780	651	1,642
11		2,048	(89)	309	39	288	66	2,750
12		180	(123)	468	267	408	356	1,679
13		679	(112)	173	72	144	117	1,185
14	3,500			192		504		4,196
15		744	(66)	362	334	247	58	1,745
16		972	(40)	523	308	1,694	823	4,320
17		2,047		20	22	384	173	2,646
18	4,500				76	168	100	4,844
19		343	(60)	520	297	144	93	1,397
20			(178)		72		342	414
21				14	17	780	597	1,408
22		558	(195)	440	108	956	492	2,554

Appendix D (cont.)

Family Number	Employment Permanent	Employment Casual	Fur[a] '61-'62[b]	Fur[a] '62-'63	Handicrafts	Social Legislation	Relief	Total Income
23				4		780		784
24	2,780			167		480	75	3,502
25		252	(50)	348	112	144	212	1,068
26		655		198	8	192	366	1,419
27		1,749	(175)	372	44	456	56	2,677
28		1,589	(161)	259	182	336	111	2,477
29	750	298	(37)	213	274	240	26	1,801
30		20		16			315	351
31						144	869	1,013
34	475	66	(225)		548	108	248	1,445
35	2,813	266	(46)	33	84	269	87	3,552
36						1,560		1,560
37		100	(106)	24			88	212
38	6,000	238		121	14	1,116	289	7,778
40	4,200		(3)	37	80	288	30	4,635
41		1,407	(64)	210		384	225	2,226
42		784	(114)	536	444	480	320	2,564
43		1,254			43	360	375	2,032
45		112					30	142
46		20	(17)	16	106	240	1,399	1,781
47	1,200		(59)	131	3	72		1,406
48		341	(73)	220	39	240	690	1,530
49		716	(85)	433	386	216	331	2,082
103		920		96	13	216	346	1,591
104		289		195	97	389	430	1,400
105		376		132		312	523	1,343
106		1,286	(24)	141	22	185	140	1,774
108		321	(107)	250	446		255	1,272
109		145	(176)	277			277	699
110		602		5	138	216	218	1,179

Appendix D (cont.)

Family Number	Employment Permanent	Employment Casual	Fur[a] '61-'62[b]	Fur[a] '62-'63	Handi-crafts	Social Legislation	Relief	Total Income
111		1,089		123		72	379	1,663
113			(9)	361	172	100	844	1,477
121		456		37	12	600	165	1,270
201		938	(102)	256	178	336	459	2,167
202		67		114	818	312	828	2,139
203		2,347	(33)	110	52	429	265	3,203
204				6	157	202	382	747
Total Coppermine Income								
	$29,523	$29,823	(3,057)	$11,506	$8,957	$21,139	$18,533	$119,481
Coppermine Camps								
32			(165)	440	201		221	862
33		105	(623)	69		312	164	650
39			(36)			336	576	912
44				80			430	510
101			(1,344)	152		216		368
102			(295)	263			45	308
107		145	(779)	1,091		480	264	1,980
112		260	(480)	301		312	167	1,040
114		96	(183)	64	26	192	565	943
115			(1,563)	240		312	260	812
116		48	(280)	158		144	349	699
117			(294)	310		72		382
118		8	(964)	274	124	336	289	1,031
119			(349)			216	368	584
120			(540)	227		288	316	831
122			(385)	392		240	30	662
123		906	(230)	62		240	159	1,367

Appendix D (cont.)

Family Number	Employment Permanent	Employment Casual	Fur[a] '61-'62[b]	Fur[a] '62-63	Handi-crafts	Social Legislation	Relief	Total Income
125		48	(1,279)	1,181		96	162	1,487
126			(1,196)	440		216	161	817
205			(80)	208	21	216	357	802
Total Coppermine Camps Income								
		$1,616	(11,065)	$5,952	$372	$4,224	$4,883	$17,047
Total Coppermine Trading Area Income								
	$29,523	$31,439	(14,122)	$17,458	$9,329	$25,363	$23,416	$136,528
HOLMAN TRADING AREA								
Holman								
1				51		200	1,259	1,510
2		41	(826)	1,430	209		238	1,918
3		155	(783)	1,369	124	216	331	2,195
4		142	(524)	1,382	405	455	136	2,520
5		228	(1,701)	295	129	144		796
6		183	(591)	1,809	138	1,012	408	3,550
7		275	(152)	298	17		61	651
8		315	(399)	590	521	24	1,524	2,974
9		25	(1,061)	871	109	360	88	1,453
10		20	(1,149)	2,202		216		2,438
11		15	(393)	142	279	264	1,443	2,143
12		7	(209)	54	20	852	1,295	2,228
13		24	(332)	772	94	72	83	1,045
14		144	(1,313)	900	111	474	23	1,652
15		109	(406)	753	65	168	128	1,223
16		39	(618)	1,425	261	368	120	2,213

Appendix D (cont.)

Family Number	Employment Permanent	Employment Casual	Fur[a] '61-'62[b]	Fur[a] '62-'63	Handicrafts	Social Legislation	Relief	Total Income
17				127	280	192	1,202	1,801
18		429	(554)	728	58	352	155	1,722
19		217	(817)	1,037	373	104	1,312	3,043
20		217	(1,314)	997		272	97	1,583
Total Holman Income		$2,585	(13,142)	$17,232	$3,193	$5,745	$9,903	$38,658
Holman Camps								
101			(373)	250		216	71	537
102		30	(642)	887	291	240	45	1,493
103		11	(1,227)	1,000	622	240		1,873
Total Holman Camps Income		$41	(2,242)	$2,137	$913	$696	$116	$3,903
Total Holman Trading Area Income		$2,626	(15,384)	$19,369	$4,106	$6,441	$10,019	$42,561
Total Coppermine - Holman Regional Cash Income	$29,523	$34,065	(29,506)	$36,827	$13,435	$31,804	$33,435	$179,089

[a]Fur year - July 1 - June 30

[b]Not included in total income

Appendix E

Capital Goods, by Family, July 1st, 1963

COPPERMINE

amily umber	Able Men	Remarks	Motor Sleds	Boats No.	Boats Type	Outboards No.	Outboards HP	Dogs	Traps	Seal Hooks	Firearms No.	Firearms Type
1	0			1	12'dinghy	1	3	7			1	22
2	1			1	16'canoe			8	40	10	2	22,30-30
3	1			1	16'canoe	1	5 1/2	8	90		2	30-30,308
4	1	PE	1	1	jollybt.						3	22,25-35,12g.
5	1			2	16'dinghy 14'speedbt.	1	10	11	200	16	5	22,222,222,30-30,12g.
6	1							9	20	8	2	22,25-35
7	1					1	15	11	100	19	3	22,30-30,12g.
8	1			1	14'canoe			8	90	13	2	22,30-30
9	0			1	14'canoe			9			3	22,25-20,30-30
10	0											
11	1			1	18'canoe	1	7 1/2	5	80	13	3	22,222,303
12	1			1	dinghy	1	3	8	80	18	3	22,222,25-35
13	1							12			1	30-30
14	1	PE	1	1	14'dinghy	1	18	6			4	22,222,300,16g.
15	1			2	dinghy jollybt.	2	3 4 inb	8	500	37	4	22,25-20,25-35,16g.
16	1			1	16'canoe	1	10	11	100	20	3	22,30-30,300
17	1			1	canoe	1	7 1/2	13	50	5	3	22,222,300
18	1	PE	1	1	jollybt.	1	18				2	22,25-35
19	1							6	90	8	2	22,303
20	0							4			2	22,222
21	0			1	18'canoe						1	22
22	1			1	14'canoe	1	3	15	85	10	6	22,25-20,250,30-30,12g.,16g.
23	0		1	1	18'canoe	1	10				3	22,30-30,12g.
24	1	PE	1	1	12'jollybt.					16	1	22
25	1			1	16'canoe	1	5 1/2	11	50	14	4	22,25-35,303,16g.

Appendix E (cont.)

Family Number	Able Men	Remarks	Motor Sleds	Boats No.	Boats Type	Outboards No.	Outboards HP	Dogs	Traps	Seal Hooks	Firearms No.	Firearms Type
26	1							9			3	22,25-20,30-30
27	1			1	20'canoe	2	10	10	380	18	5	22,222,300,308,12g.
							18					
28	2			1	18'canoe	1	5 1/2	9	270	13	1	250
29	1	PE		1	18'canoe	1	10	7	60		2	30-30,12g.
30	1			1	14'jollybt.	1	5 1/2					
31	1	CH		1	18'canoe	1	5 1/2				1	22
32	1			1	jollybt.	1	9 inb	7	50	10	3	30-30,300,303
33	1			1	16'canoe			6	20	12	2	22,30-30
34	2	CH,PE		1	canoe							
35	1							7	50		2	222,12g.
36	0			1	16'canoe	1	3	5			2	22,30-30
37	1							7			1	30-30
38	3	PE	1	1	jollybt.	1	18	1		5	2	22,300
39	0							1			1	22
40	2	PE,PE	1	1	jollybt.						2	22,300
41	1			1	16'canoe	3	5 1/2	8	90	9	2	22,30-30
							10					
							9 inb					
42	2			1	speedbt.	2	5 1/2	7	50	6	3	22,30-06,12g.
							10					
43	1		1	1	12'jollybt.				100		3	222,303,308
44	1										1	22
45	1			2	16'canoe	2	10	1	30	8	3	30-30,300,12g.
					speedbt.		10					
46	3	CH										
47	1	PE				1	10	9	25	8	2	22,30-30
48	1			1	dinghy	1	5	9	100	7	3	22,222,303
49	1			1	20'canoe	1	7 1/2	9		13	5	22,22,222,25-35,303
50	1					1	5 1/2	12	75		2	22,222
51	1							8	90		2	22,250

Appendix E (cont.)

COPPERMINE CAMPS

amily umber	Able Men	Remarks	Motor Sleds	Boats No.	Boats Type	Outboards No.	Outboards HP	Dogs	Traps	Seal Hooks	Firearms No.	Firearms Type
lifton Point												
101	2			3	18'canoe	3	3 1/2	19	210	20	10	22,22,22,30-30,30-06,30-06,
					21'canoe		5 1/2					30-06,16g.,16.,20g.
					speedbt.		18					
oppner River												
102	1			2	canoe	1	inb	12	60	9	4	22,30-30,303,308
					jollybt.							
ead of Rae River												
103	1							no data				
104	2							no data				
ernard Harbour												
105	1			1	jollybt.	1	10	9	60	14	3	22,303,12g.
106	1					1	5 1/2	6	85	10	2	22,303
asil Bay												
107	2							no data				
outh of Rae River												
108	3			2	16'canoe	1	10	7	20	14	4	22,25-35,303,16g.
					22'canoe							
109	1			1	13'speedbt.	1	5	9	50		2	22,30-30
110	1			1	20'canoe	2	5	9			2	22,300
							10					
111	1			2	18'canoe	1	10				2	222,30-30
					jollybt.							
ree River												
112	2			2	jollybt.	2	15	19	40	22	3	22,30-30,303
					jollybt.		inb					
113	2			1	dinghy	1	10	8	25	17	4	22,25-35,30-30,12g.
114	1			1	16'speedbt.	1	10	11	50	20	2	22,30-30
115	1			1	speedbt.			13	800	14	4	22,270,270,30-30.
116	1			1	18'canoe	1	5 1/2	13	200		4	22,222,300,16g.

Appendix E (cont.)

Family Number	Able Men	Remarks	Motor Sleds	Boats No.	Boats Type	Outboards No.	Outboards HP	Dogs	Traps	Seal Hooks	Firearms No.	Firearms Type
Richardson Island												
117	2			1	jollybt.	3	10	20	250	16	4	22,222,25-20,30-30
							3					
							6 inb					
Lady Franklin Point												
118	2		2	1	jollybt.	1	inb	6	300	10	4	22,22,222,16g.
119	1					1	5 1/2	10	75	8	5	22,22,222,30-30,30-06
120	1			1	24'canoe	1	5	11	150	12	5	22,222,25-20,300,12g.
121	1			1	jollybt.	1	3	7	30		2	22,30-30
122	1			1	20'canoe	1	18	14	300	10	5	222,25-35,270,30-30,16g.
123	2			2	jollybt.	1	inb	9	100	14	5	22,22,22,303,16g.
					dinghy							
124								no data				
Read Island												
125	2			2	36'schooner	2	9 inb	13	600	40	4	22,30-30,303,16g.
					jollybt.		5 1/2					
126	1			1	18'canoe	1	5 1/2	15	300	10	5	22,222,270,303,16g.
HOLMAN												
1	0							1		1	1	22
2	2			1	jollybt.	1	3	15	300	10	7	22,22,222,270,30-30,300, 303
3	1			2	jollybt.	1	5 1/2	12	300	10	2	22,300
					skiff							
4	1			1	jollybt.	1	3	14	200	8	3	22,270,16g.
5.	2			1	22'canoe	1	7 1/2	9	100	15	3	22,270,12g.
6	2			1	12'speedbt.	1	10	21	300	10	6	22,22,222,270,30-30,16g.
7	1			1	10'skiff			6	60	7	3	22,303,12g.
8	3			1	jollybt.	1	5 1/2	17	40	8	5	25-35,270,30-06,300,12g.
9	1			1	jollybt.	1	5	15	170		3	22,270,12g.

Appendix E (cont.)

amily umber	Able Men	Remarks	Motor Sleds	Boats No.	Boats Type	Outboards No.	Outboards HP	Dogs	Traps	Seal Hooks	Firearms No.	Firearms Type
10	1			2	22'canoe	2	10	15	600		4	22,270,303,12g.
					18'speedbt.		10					
11	0											
12	0.			1	jollybt.	1	5				5	22,22,25-20,25-35,12g.
13	1							12	100	10	5	22,25-20,30-30,300,12g.
14	1			1	13'speedbt.	2	5 1/2	18	300	20	4	22,270,30-30,12g.
							10					
15	1			1	20'canoe	1	7 1/2	12	250	9	3	22,300,303
16	2			1	jollybt.	1	5 1/2	20	550	8	6	22,22,22,270,30-30,12g.
17	0							2		1	2	22,22
18	1			1	jollybt.	1	5	9	175	10	4	22,25-35,300,12g.
19	2			1	jollybt.	1	5 1/2	10			4	22,270,30-30,16g.
20	2			1	16'canoe	1	5 1/2	7	600	10	3	22,270,12g.
					HOLMAN CAMPS							
into Inlet												
101	1			1	jollybt.			9		6	5	22,25-20,30-30,303,16g.
102	2			1	jollybt.	1	5 1/2	15	200	10	8	22,22,25-20,250,30-30,300, 16g.,16g.
erkeley Point												
103	4			3	18'canoe	3	3 1/2	20	500	10	10	22,22,22,222,25-20,270,303, 410,12g.,16g.
					20'canoe		3 1/2					
					whalebt.		6 1/2	inb				

PE - Individual permanently employed for wages.
CH - Individual in Camsell Hospital, Edmonton, throughout year preceding July 1, 1963.

inb - Inboard engine.

Appendix F

Comparative Retail Prices, 1963

Groceries	Coppermine	Holman	Montreal
flour (25 lbs.)	4.55	4.50	2.59
rolled oats (5 lbs.)	1.15	1.20	.65
pablum (1 lb.)	.68	.73	.47
white sugar (10 lbs.)	2.20	2.16	1.34
salt (2 lbs.)	.47	.43	.18
lard (3 lbs.)	1.30	.99	.63
butter (1 lb.)	1.10	1.05	.58
evaporated milk (large can)	.29	.25	.17
eggs (1 dozen)	.84-1.25	n.s.	.45
bread (24 oz. white loaf)	.40- .95	n.s.	.22
canned luncheon meat	.67	.65	.49
corn flakes (8 oz.)	.39	.44	.21
tomatoes (20 oz. can)	.42	.40	.29
orange juice (20 oz. can)	.41	.40	.30
tea (1 lb. package)	1.40	1.45	.75
coffee (1 lb. tin)	1.05(pkge.)	.95	.93
chocolate bars	.13	.13	.10
soft drinks (canned)	.27	.30	.08
corn meal (5 lbs.)	1.15	1.10	.68
dry dog food (25 lbs.)	4.80	n.s.	3.69

Appendix F (cont.)

	Coppermine	Holman	Montreal
cigarettes (20)	.40	.40	.40
cigarette tobacco(1/2 lb.)	2.00	1.95	1.89
bar of bath soap	.15	.15	.13
<u>Clothing</u>			
woolen work socks	.90-1.50	1.20	.79-.98
work shirts	3.79-4.79	3.79-4.79	2.98
rubber boots	5.49-6.39	7.00	4.99
<u>Fuel</u>			
heating oil (1 gallon)	.79	.79	.17.3
white gas (1 gallon)	1.10	1.20	.40.9
leaded gas (1 gallon)	1.10	1.20	.40.9
<u>Equipment</u>			
traps (size 1 1/2)	1.25	.95	
.22 long shells (50)	.87	.85	.80
.222 shells (20)	3.65	3.60	3.40
.270 shells (20)	5.50	5.50	5.10
.30-30 shells (20)	4.40	4.50	4.10
12 guage shot (25)	3.70	3.75	3.25
.222 reload kit (20)	n.s.	1.50	
.270 reload kit (20)	n.s.	3.00	
.222 rifle	89.95	69.95	77.45
20' canoe	529.00	500.00	
10 HP Johnson outboard	400.00	450.00	399.00

n.s. - not sold at this store

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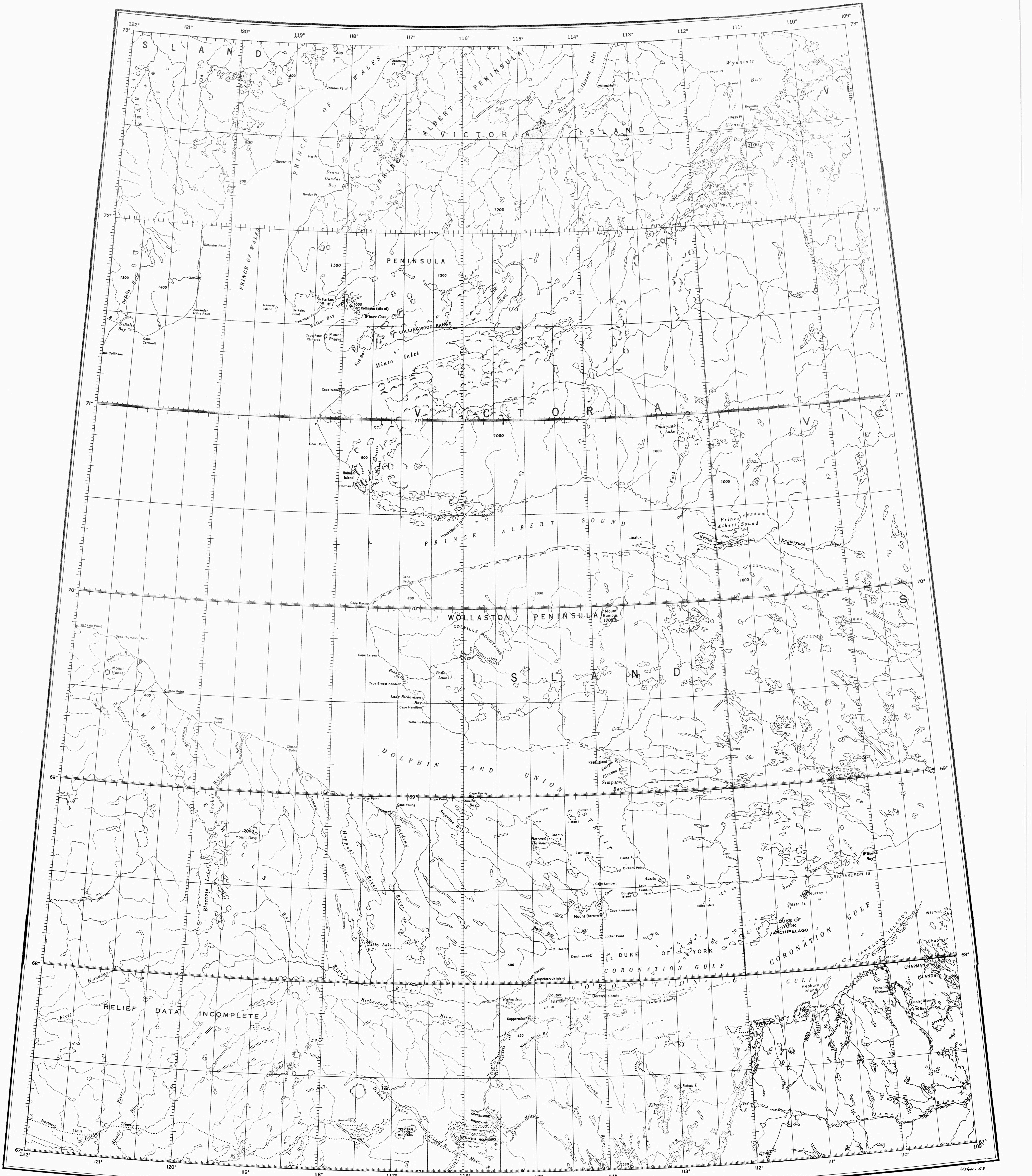

COPPERMINE - HOLMAN REGION

ELEVATIONS IN FEET

MAP 2
PLACE - NAMES

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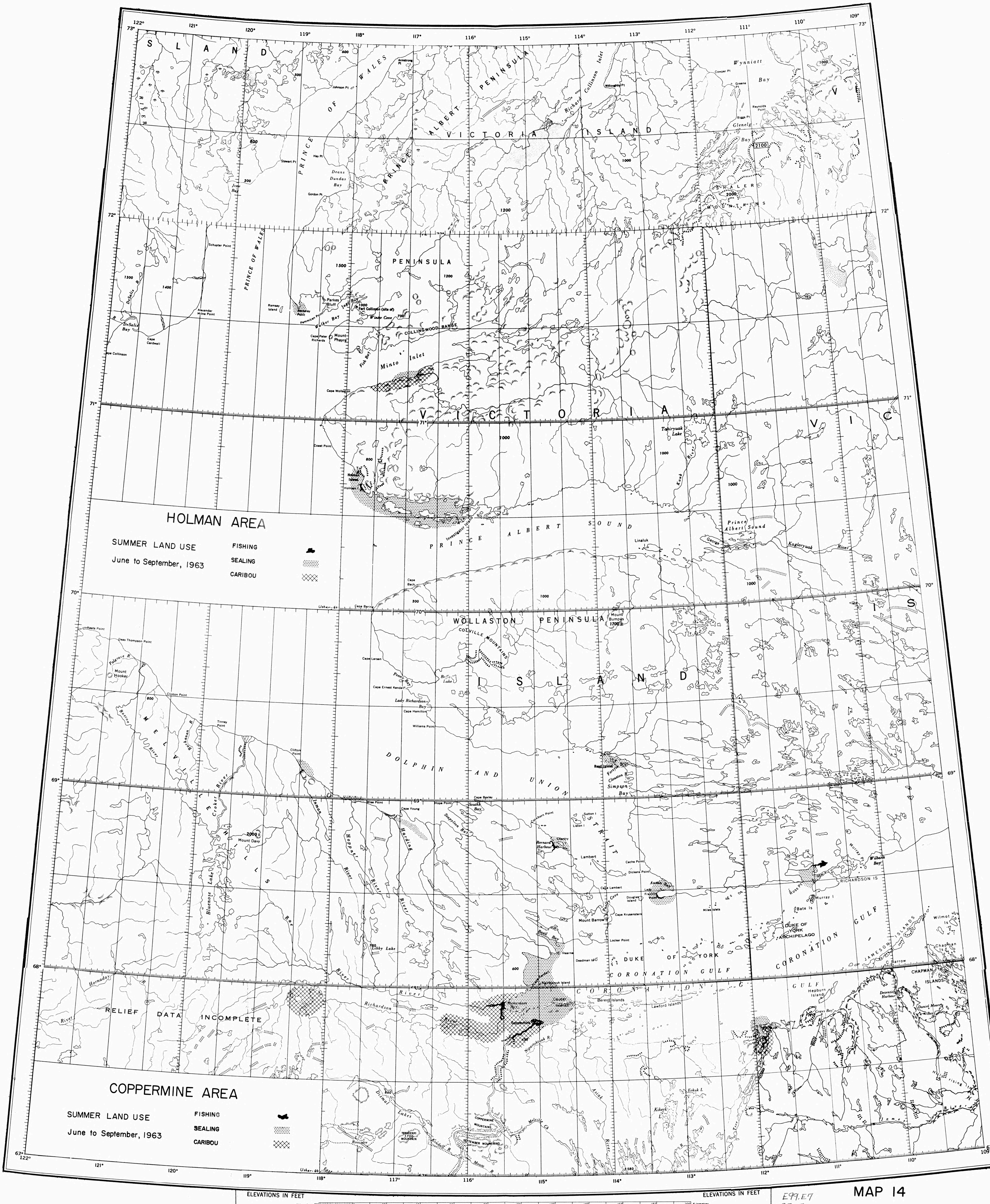
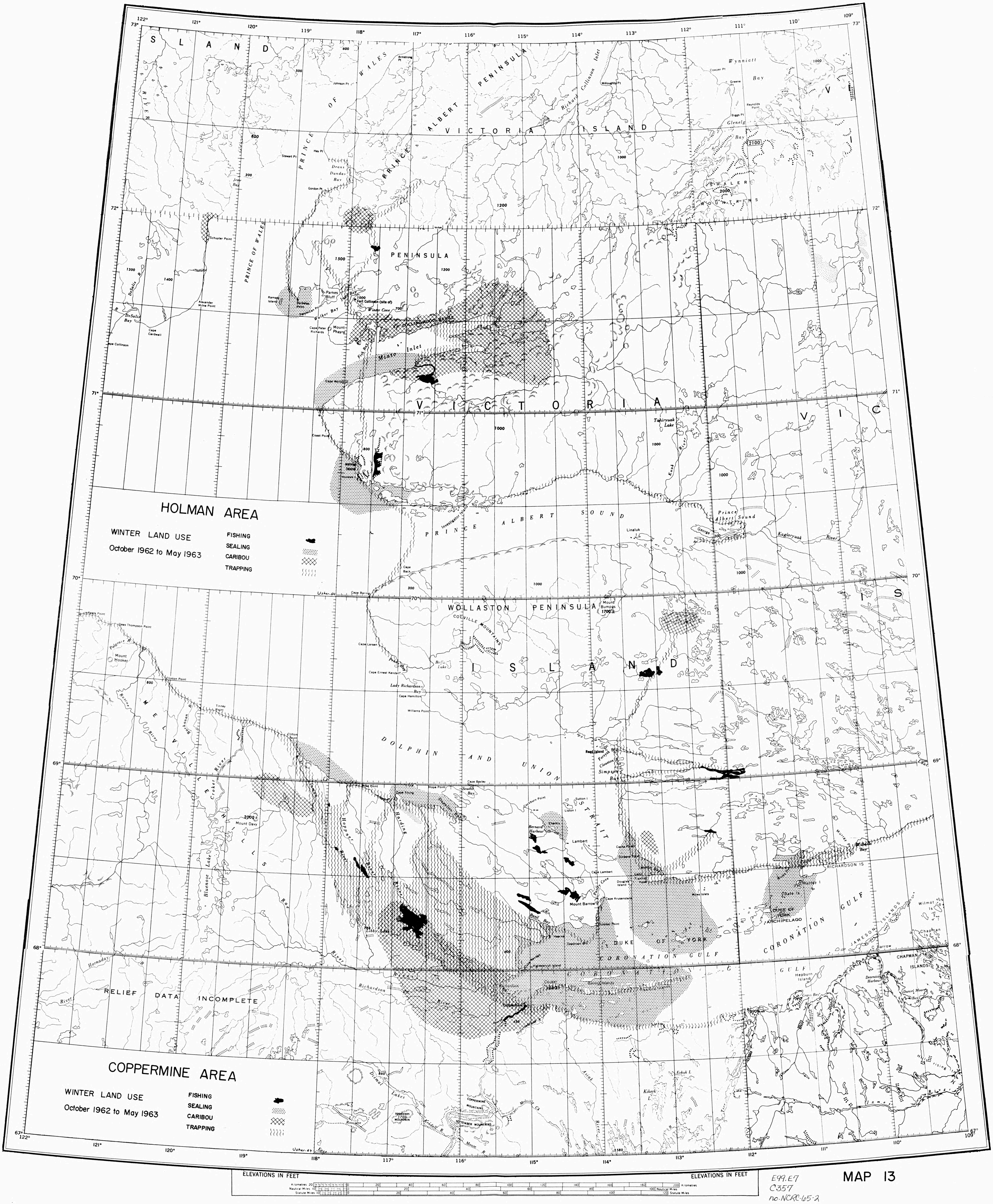

HOLMAN AREA
SUMMER LAND USE
June to September, 1963
FISHING
SEALING
CARIBOU
COPPERMINE AREA
SUMMER LAND USE
June to September, 1963
FISHING
SEALING
CARIBOU
VICTORIA ISLAND
PRINCE ALBERT SOUND
WOLLASTON PENINSULA
DOLPHIN AND UNION STRAIT
CORONATION GULF
DUKE OF YORK ARCHIPELAGO
RELIEF DATA INCOMPLETE
PRINCE ALBERT PENINSULA
PRINCE OF WALES STRAIT
Minto Inlet
COLLINGWOOD RANGE
COLVILLE MOUNTAINS
MELVILLE HILLS
Wynniatt Bay
Glenelg Bay
Richard Collinson Inlet
ELEVATIONS IN FEET
Kilometres
Nautical Miles
Statute Miles

MAP 14


HOLMAN AREA
WINTER LAND USE
October 1962 to May 1963
FISHING
SEALING
CARIBOU
TRAPPING
COPPERMINE AREA
WINTER LAND USE
October 1962 to May 1963
FISHING
SEALING
CARIBOU
TRAPPING
VICTORIA ISLAND
PRINCE ALBERT PENINSULA
PRINCE OF WALES STRAIT
PRINCE ALBERT SOUND
WOLLASTON PENINSULA
DOLPHIN AND UNION STRAIT
CORONATION GULF
DUKE OF YORK ARCHIPELAGO
RELIEF DATA INCOMPLETE
MELVILLE HILLS
ELEVATIONS IN FEET
MAP 13