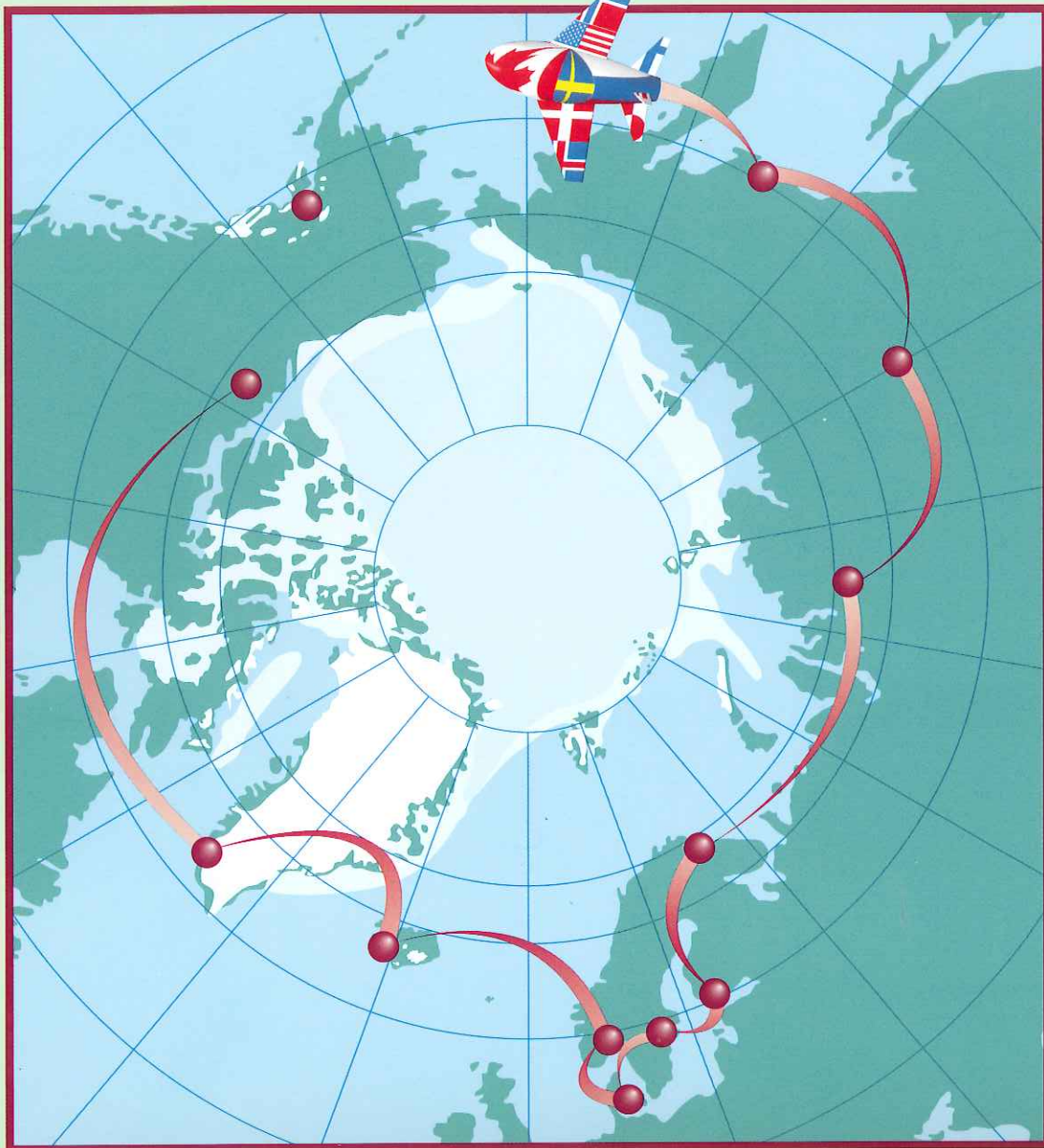


The Northern Circumpolar World

Bob MacQuarrie



Revised 2008



The Northern Circumpolar World

Bob MacQuarrie



Northwest
Territories Canada

Canadian Cataloguing in Publication Data

MacQuarrie, Bob.

The northern circumpolar world

Includes index.

ISBN 1-895073-20-0

1. Arctic regions—Geography—Juvenile literature. I. Title.

GF891.M32 1996 909'.091'3 C96-910348-4

Notes on 2008 revision

I would like to extend my gratitude to the following educators who participated in the revisions of this book in 2008:

Gillian Dawe-Taylor

Merril Dean (again !)

Jill Taylor

Chris Pyke

Deborah Maguire

We would also like to thank Bob Worsley from Info Networks for all his assistance with the technical side and desktop publishing.

John Stewart

Social Studies Curriculum Coordinator



Northwest
Territories Canada

Contents

Appreciation	iv
Notes	1
Foreword	2
Chapter 1	
The Arctic Ocean.....	4
Chapter 2	
Canada	12
Chapter 3	
Greenland	28
Chapter 4	
Iceland	38
Chapter 5	
Norway.....	46
Chapter 6	
Denmark	58
Chapter 7	
Sweden.....	66
Chapter 8	
Finland	78
Chapter 9	
Russia	88
Chapter 10	
Alaska	100

Reports from the Top of the World

Chapter 11	
Factors That Control the Northern Climate	115
Chapter 12	
Climate	121
Chapter 13	
Land	130
Chapter 14	
Plants	137
Chapter 15	
Animals	145
Chapter 16	
First Peoples	153
Chapter 17	
European Migrations	161
Chapter 18	
The North Today	173
Chapter 19	
Challenges	181
Chapter 20	
Circumpolar Links	188
Epilogue	
Alice Bohnet's Letter	197
Glossary	198
Credits.....	202

Appreciation

I would like to thank people who contributed to the preparation of this book.

Educators in the Department of Education, Culture and Employment, Government of the Northwest Territories, were particularly helpful in providing direction and offering useful suggestions throughout the project. These include Jean-Marie Beaulieu, Debby Dobson, Barbara Hall, Brian Menton, and Kathy Zozula.

For sharing personal experience and information gathered during their travels, I would like to thank Irene Johnson (Yukon), Ben Nind (Greenland), and Clive Tesar (Siberia). My thanks to Dean Cluff, Polar Bear Biologist, Department of Renewable Resources, GNWT; Anne Gunn, Caribou Biologist, Department of Renewable Resources, GNWT; and Helmut Epp, Director, NWT Centre for Remote Sensing, GNWT.

A very special thank you to several generous people who provided comments and/or information on drafts of particular chapters: Barbara Phillips, Intermediate Program Coordinator, Yukon Department of Education (Chapter 2, Yukon); Aleqa Hammond, Representative of the Secretariat to the Cabinet, Greenland Home Rule Government (Chapter 3); Tryggvi Jakobsson, Head of AV, Media Department, National Centre for Educational Materials, Reykjavik, Iceland (Chapter 4); Carl P. Salicath, First Secretary, Embassy of Norway in Ottawa (Chapter 5); Otto H. Larsen, Counsellor, Embassy of Denmark in Ottawa, Louise Nabe Larsen and Inge Lise Hammer (Chapter 6); Amelie Heinsjö, Information Officer, Embassy of Sweden in Ottawa (Chapter 7); Outi Polón, Attache, Embassy of Finland, Ottawa (Chapter 8); Allison Abraszko, Reference Librarian, US Embassy in Ottawa (Chapter 10); Johanne Tungilik, Habitat Technician, Department of Renewable Resources, GNWT (Chapter 14); Ron Graf, Assistant Director, Wildlife Management Division, Department of Renewable Resources, GNWT (Chapter 15); Elisa Hart, Arctic Archaeologist, and Tom Andrews, Subarctic Archaeologist, Prince of Wales Northern Heritage Centre, Yellowknife (Chapter 16).

Finally, thank you to the educators and students who offered constructive criticism and advice after reading a draft of the completed text. These include Geraldine Balzer, Jean-Marie Beaulieu, Sean Daly, Merrill M. Dean, Debby Dobson, Ellie Elliot, Diane Essery, David Harrison, Brenda Illaszewicz, Ted Johnston, Arnold Krause, Duane Magoon, Howard Marshall, Kurt Mineault, M S Naidoo, Christine Purse, and Norman Vaughan.

Advice offered, though always appreciated, was not always followed. Therefore, all shortcomings and errors remaining in the text, as well as any views expressed or implied, are the responsibility of the author and the Department of Education, Culture and Employment, Government of the Northwest Territories.

Bob MacQuarrie

NOTE 1: The neutral designations BCE and CE are used in this book. BCE stands for “Before the Common Era” and CE stands for “the Common Era.” These designations refer respectively to the same time periods as BC and AD.

NOTE 2: Where dollar figures are used to describe values of trade and commerce, they are expressed in US currency and the numbers have been rounded off. Population and life expectancy figures are estimates, and have also been rounded off. Trying to be exact in these matters is an impossible task since different sources provide slightly different numbers and since the numbers change from year to year (indeed, population figures are changing daily). In any event, the figures are useful only for comparative purposes at a particular point in time, and these purposes are adequately served by rounded figures.

NOTE 3: Terms and concepts that are in bold type have been defined in the glossary.

Foreword

*September 1
Tuktoyaktuk, NWT, Canada*

Dear Friends:

At last ! Nine other lucky students and I are in Tuktoyaktuk on the shore of the Arctic Ocean. In our group are: Niels Aalborg, Marry Dillon, Jens Hammer, Alfrida Myrdal, Jimmy Nevak, Johannes Qukausiqtog, Reino Saarinen, Fjóla Vilhjálmsdóttir, Larisa Yakovlev – and me! Alice Bohnet is our teacher-chaperone.

Each of us comes from a circumpolar country. Circumpolar countries are quite different from one another in culture and language, but fortunately all of us speak, read, and write English.

We are excited because we have been selected to take part in a very special expedition. Our journey will take us around the northern circumpolar world. We will travel in the arctic and subarctic regions of Canada, Denmark (Greenland), Finland, Iceland, Norway, Russia, Sweden, and the United States (Alaska). Our journey is sponsored by our various governments and by northern businesses.

First, we'll visit the area of the Beaufort Sea, learning about the Arctic Ocean. Next we'll travel southwest to the Yukon. Then we'll move eastward through the lands surrounding the Arctic Ocean. In each country we'll be billeted with families that have one or more English-speaking members. We'll travel by bus, boat, airplane, and sled. Sometimes we'll even put on our backpacks and hike. We'll spend a few weeks in each circumpolar country visiting places of interest. We're sure to meet many new people and see some very interesting sights !

We're expected to work, too. We'll keep a record of our journey. As we travel, we'll ask questions and watch and listen carefully. We'll learn all we can about the people, their jobs, and their ways of life. We'll learn about the plants and animals that inhabit the Arctic and the Subarctic. We'll learn about the land we walk on and the weather we experience. We'll make notes and take photographs. We'll even record what we see with a digital video camera!

We will return home in March. We'll sort through all the information we've gathered, examine it carefully, and try to draw some conclusions about our experiences. Each of us will then write a report about a different feature of the northern world. We'll send our reports to each other for comment. Then the reports will be put together in a book for students all over the North. We really want to do a good job on them!

Would you like to join us on this adventure of a lifetime? Let's go!

THE NORTHERN CIRCUMPOLAR WORLD



These are the countries that we will visit as we explore the northern circumpolar world. The polar ice pack is a permanent feature of the Arctic Ocean. The sea ice (average fall minimum) shown on this map, and many others in this book, recedes in the spring and advances in the winter.

The Arctic Ocean

CHAPTER 1



These grasses lead to the beach near Tuktoyaktuk. Tuktoyaktuk is a hamlet on the Beaufort Sea coast. The hamlet's name is an Inuktitut word meaning "looks like caribou."

We sit on the beach at Tuktoyaktuk and take off our shoes and socks. Then we wade in the Arctic Ocean. The water is cold! We knew it would be, but we want to start our journey through the circumpolar world this way.

Mary, who lives here, soon calls to tell us that our ride has arrived. As I wait in the lineup to board the bus, I can see the ocean on one side of me. In the distance on the other side, I see huge earth-covered ice mounds called pingos. My arctic adventure has finally begun!

Soon we're on the bus, heading for the harbour. Jonah Carpenter, the Canadian government representative who welcomed us last night,

stands at the front of the bus. He tells us we will soon be boarding a tug. Tugs pull barges of supplies to arctic communities. This re-supply of fuel oil, dry goods, hardware, food, mechanical equipment, construction materials, and many other items is done every year before winter. The supplies reach Tuktoyaktuk by first coming down the great Mackenzie River on barges. These barges are the property of a company whose shares are owned by northern Aboriginal groups.

Before long we are out on the rough, dark waters of the Beaufort Sea. The sight of land fades quickly behind us. We are heading for Sachs Harbour on Banks Island. Mr. Carpenter introduces us to the ship's captain.



The pingos near Tuktoyaktuk are huge earth-covered ice mounds.

The Arctic Ocean and Nearby Water Bodies



THE WORLD'S SMALLEST OCEAN

The Arctic Ocean is roughly oval shaped. It is about 4000 kilometres from Point Barrow, Alaska to Hammerfest, Norway. In the other direction, from Ellesmere Island, Canada across the North Pole to Russia, the distance is about 2000 kilometres. In area, the ocean covers about 14 000 000 km².

The captain tells us about the Arctic Ocean. He says there is a large flow of *fresh* water into the Arctic Ocean. It comes from many rivers, including four of the largest rivers in the world: the Ob, the Yenisey, and the Lena in Russia, and the Mackenzie in Canada. The large volume of fresh water dilutes the salt near the ocean's surface.

This helps explain why the ocean freezes in winter.

Our captain also tells us that the ocean floor that reaches out from the coastline is called the *continental shelf*. This shelf is very wide in some parts of the Arctic Ocean, especially north of Europe and Asia. The water above the shelf can be quite shallow, averaging only about 200



A tug is a small but powerful boat that pulls barges carrying supplies to arctic communities.



The deckhands help the captain navigate the tug through the Beaufort Sea to Banks Island.

metres in depth. There are very deep parts in the middle of the ocean.

The deepest part is about 4500 metres, near the North Pole. There is even a mountain range on the ocean floor with peaks close to 2700 metres high!

When we reach Sachs Harbour, our hosts greet us and take us to their homes. Later we take a walk with them and learn about their way of life. During our tour, we stop to watch the barges being unloaded. We sense their excitement and pleasure in knowing that their community has all the supplies they need to see them safely through another winter.

The next day we fly in a Twin Otter over the high **plain** on Banks Island. We are all impressed with the great barren island and its vast, rolling spaces. We are thrilled to see a herd of Peary caribou below. Later, we see herds of big, woolly musk ox. That keeps us talking for hours with our hosts after we get home.

We learn how important these animals are to people here. Their meat, along with other produce from the land such as fish and berries, is often referred to as *country food*. Country food makes up a very important part of their diets. Our hosts say it is fresher, better-tasting, healthier, and less expensive than food in the store. We also learn that the aboriginal people, the Inuvialuit, who are the majority of the population in the region, earn cash by selling musk ox meat to people in southern Canada and other countries.

The following day we fly out again. This time we head for M'Clure Strait north of Banks Island. That is where the permanent pack ice begins. When we fly over the ice, our guide tells us about it.

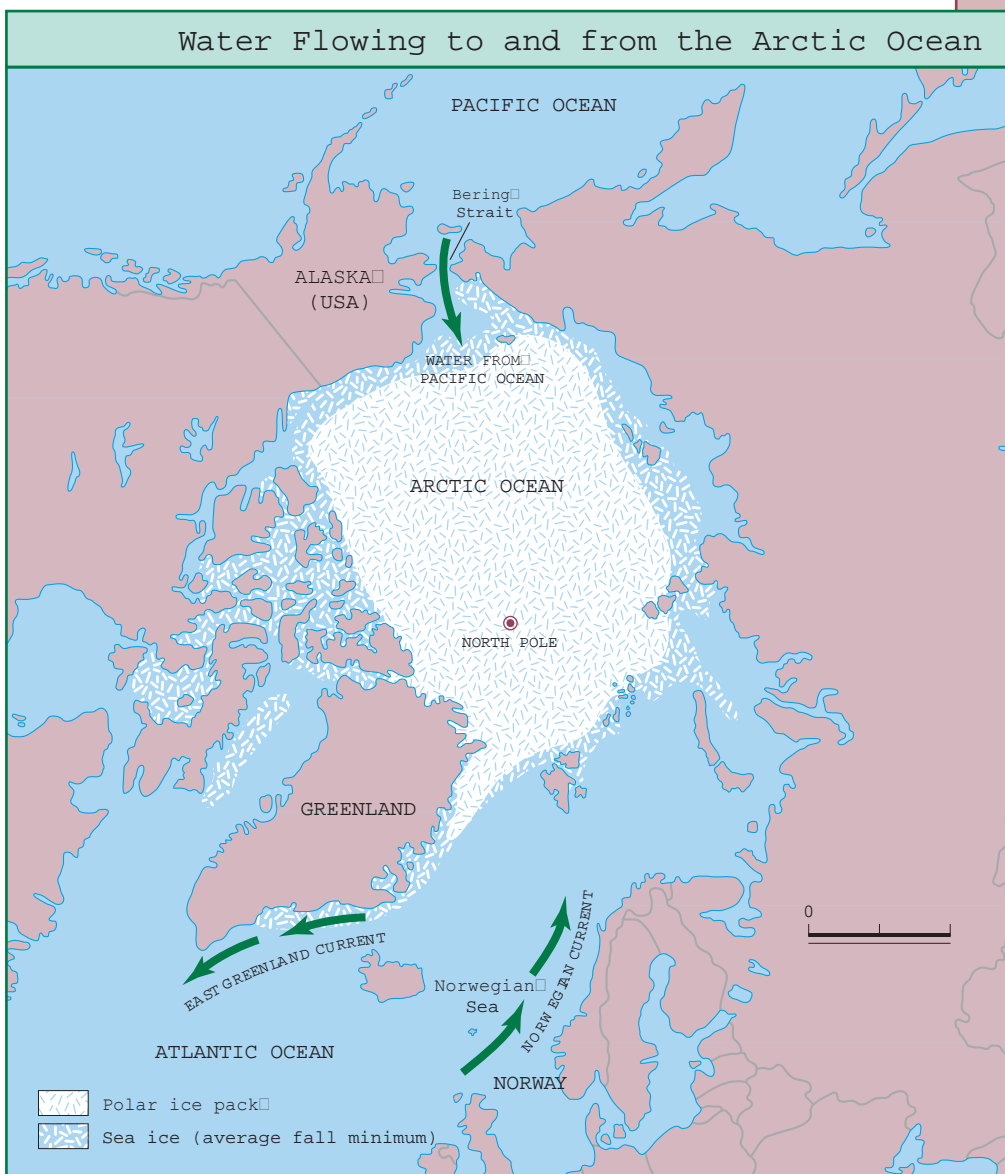
The central part of the Arctic Ocean is always covered by a thick pack of ice that floats on the water beneath it. Temperatures in the Arctic have not usually been warm enough to melt the pack, even in summer. This has recently begun to change. Recent scientific data has shown that the thickness of permanent sea ice has been in decline during the past thirty five years. The mean thickness of sea ice has dropped from 3.1 meters to 1.9 meters thick. That is approximately a 40% reduction in thickness over the past three decades.



Sachs Harbour is on the southwestern corner of Banks Island. See the map on page 13.

This thick pack can move, pushed by tides, currents, winds, and the turning of the earth. These powerful forces break the pack into very large pieces of different shapes and sizes called *floes*. The floes sometimes crash into one another so hard that they form *pressure ridges*. Pressure ridges can jut more than five metres above the ice surface, and more than five metres below it. The floes may also pull apart, briefly leaving a line of open water between them—even in the dead of winter. These openings, called *leads*, soon freeze over again.

Seeing the great pack of ice makes me admire more than ever the people who travelled through the Arctic Ocean in boats or small ships before the airplane and radio communication were invented. I think of people who have camped, sledged, skied, and walked across the arctic ice to learn more about our wonderful world and to satisfy their adventurous spirits. I wonder if travelling through, or under, this vast sheet of ice will ever become common?



CURRENTS WITHIN THE ARCTIC OCEAN

The main surface current is the Transpolar Drift Stream. It moves from Siberia to the east of Greenland. Ice drifting on this current takes about three years to make the crossing.

Another significant current is the Beaufort Gyral Stream. It is a circular, clockwise movement of water between Canada and the northern coast of Greenland. Ice drifting on this current takes from seven to ten years to make the full circuit.

See the map on this page for other currents affecting the Arctic Ocean.

Water flows into the Arctic Ocean from the Pacific Ocean through the Bering Strait and, more importantly, from the Atlantic Ocean in the Norwegian Current. The main outflow from the Arctic Ocean is east of Greenland. It is called the East Greenland Current.



*In 1969, an oil tanker called the *Manhattan* (the ship on the left) got stuck in the pack ice in M'Clure Strait. The *John A. Macdonald* (the ship on the right) came to the rescue.*

To impress on us just how thick the pack ice is, our guide tells us that a huge and powerful American oil tanker *Manhattan* tried to break its way through M'Clure Strait in 1969. It got stuck in the ice down below where we are flying at this very moment. It was helped out of its predicament by the Canadian icebreaker *John A. Macdonald*.

We learn that the central core of this permanent pack ice is surrounded by open seas in the summer. In fall, the open water thickens to sludge and then freezes. The area of ice in the Arctic Ocean doubles by early winter and extends all the way to the surrounding land masses. Icebreakers can help ships to move through the ice in the late spring, summer, and early fall. But when tempera-

tures drop, darkness returns, new ice builds up, and navigation stops.

Our guide says that we must treat the Arctic Ocean carefully. The arctic environment can be easily damaged and takes a long time to heal. Natural processes slow down in cold temperatures, so an oil spill, for example, takes a much longer time to break down and be absorbed than it takes in warmer oceans.

As we turn back toward Sachs Harbour, we notice a buildup of dark clouds ahead. This worries us a bit, because we don't want to fly through a storm. We are very happy when we finally touch down safely on the runway.

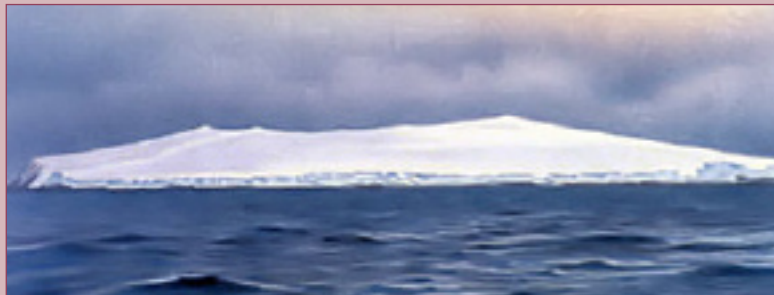
Drizzle and light snow flurries keep us in Sachs Harbour for two more interesting days. We learn more about the Inuvialuit way of life. We hear about the terms of the Inuvialuit land claim that was agreed to by the Government of Canada. We have time to develop our new friendships. When the **weather** clears, we take off for Inuvik where we will board a bus for the Yukon.

SEARCH

Research the kind and extent of pollution currently affecting the Arctic Ocean. Gather information on how governments handle this problem. Write a letter to the government suggesting the best way to combat this problem.

ICE ISLANDS

Ice islands are formed when glacier ice breaks off an ice shelf at the northern end of Ellesmere Island or Greenland. Like icebergs, they are made of fresh water, but they are much bigger. They may be 60 metres thick and 30 kilometres wide. They get locked into the pack ice and float slowly in clockwise circles on the North American side of the Arctic Ocean. They may last as long as 30 years before they dissolve and break up. Scientists have sometimes set up long-term camps on ice islands to study arctic conditions.



Pobeda Ice Island in the Mawson Sea

POLYNYAS

Polynyas are semi-permanent areas of open water in the arctic sea ice. What creates them is not known for certain. One theory is that warmer water from the ocean depths rises to the surface and keeps the water open. Polynyas are often rich in plankton, krill, and cod. Because of the availability of these foods, polynyas may serve as breeding grounds for some arctic sea birds or as overwintering areas for marine mammals. One of the largest polynyas in the Arctic is "North Water" in Smith Sound, near the north end of Baffin Bay. In area, it is 85 000 km². Most polynyas are much smaller.



"North Water" in Smith Sound, near the north end of Baffin Bay



Arctic ice near the shoreline melts in the spring. It will thicken and freeze again in the fall.

SEARCH

Read several accounts of journeys to the North Pole. Which journey was the most successful?

THINK

Which is the more efficient way to supply Arctic communities; ships or airplanes?

WEB LINKS

eLibrary

Address: <http://elibrary.bigchalk.com/libweb/canada/do/login>

NWT access - Username: govont0201 - Password: elca

CultureGrams

Address: <http://online.culturegrams.com/>

NWT access - Username: govnorthwest - Password: welcome

Canadian Space Agency

<http://www.asc-csa.gc.ca/eng/default.asp>

Arctic Environment and Conservation

http://www.panda.org/about_wwf/where_we_work/europe/what_we_do/arctic Arctic/index.cfm

Canada

CHAPTER 2



The Dempster Highway is more than 700 kilometres long.

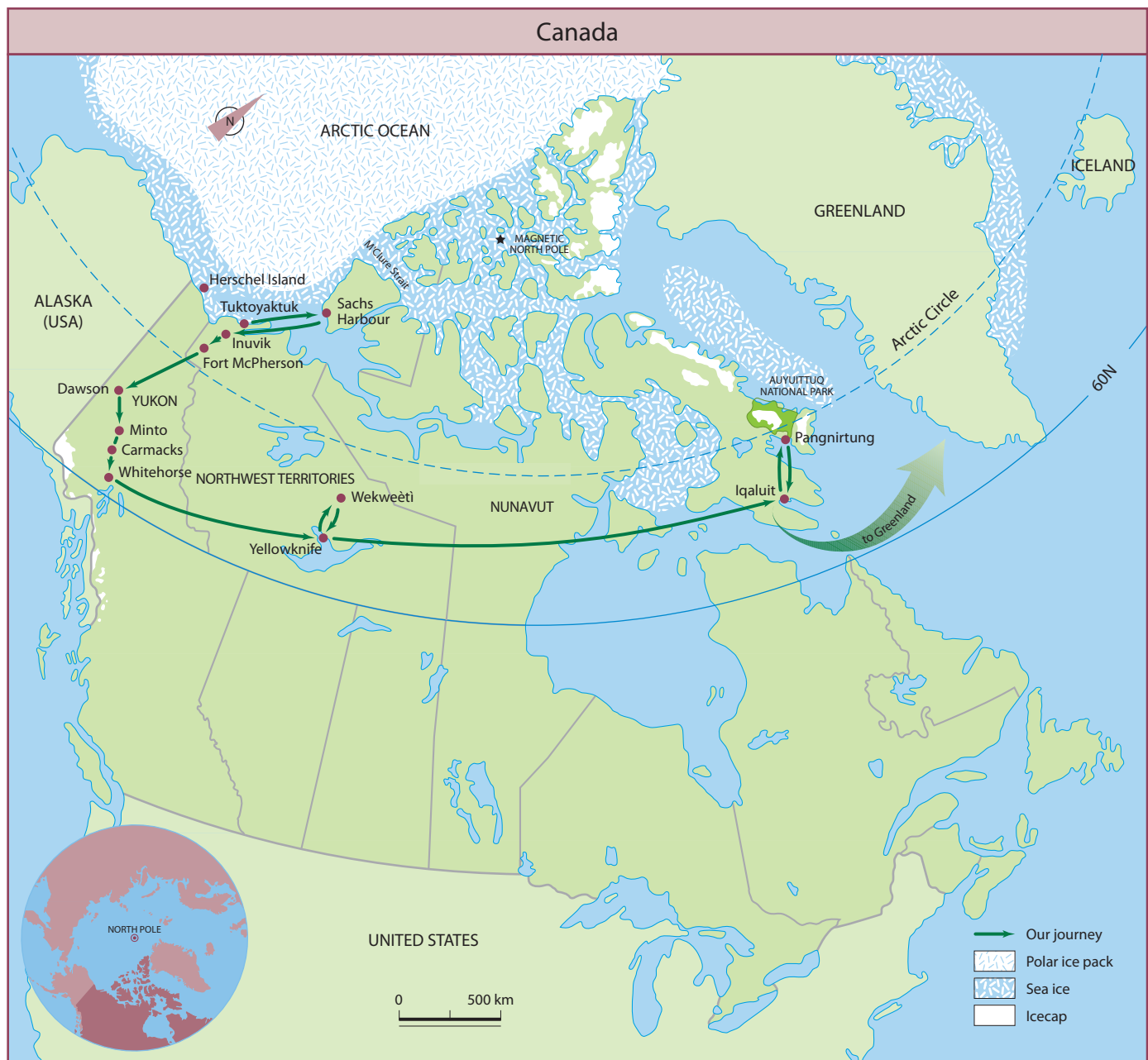
It is crisp and sunny as we board the bus in Inuvik. Travelling along the graveled Dempster Highway, we head southwest to Dawson City in the Yukon Territory. Chilly winds have blown many leaves off the willows, but there are still enough left to make the landscape bright. Further along we enjoy the changing colours of the tundra.

The Dempster, one of the world's most northerly highways, is more than 700 kilometres long. It passes through spectacular scenery. It is named after Inspector W.J.D. Dempster, a member of Canada's famous North West Mounted Police. He worked in the Yukon in the early 1900s.

About two hours after we begin, we drive onto a ferry and cross the wide Mackenzie River. It is an exciting experience. Soon we arrive at Fort McPherson on the Peel River. It is the main community of the Gwich'in in the Northwest Territories.

The Gwich'in are Aboriginal people who have traditionally lived on the boundary of the Arctic, next to the Inuvialuit. The two peoples have historically traded with one another and sometimes intermarried. The Gwich'in signed a land claim agreement with the Government of Canada in 1991.

In Fort McPherson, we visit an interesting factory that makes canvas goods such as tents and tote bags. We also visit the gravesites of The



Our journey in Canada begins at Tuktoyaktuk and ends at Iqaluit.

Lost Patrol. This was a patrol of four North West Mounted Police officers who starved and froze to death while travelling by dog sled in the winter of 1910-11.

Then we continue the long ride to Dawson City. It lies in a beautiful setting near mountains. That is one reason it is a popular destination for tourists. Another reason is that Dawson City was world famous at one time. Gold was discovered there in 1896. Nuggets were found lying in the bed of Bonanza Creek by Kate and George Carmack and Kate's brothers Skookum Jim and Tagish Charlie. A gold rush began when the first big gold

shipment left the area in 1897. The Klondike Gold Rush was named for the Klondike River that flows into the Yukon River near Dawson City. The Klondike lent its name to the whole region.

During the gold rush, people came from all over the world. Many embarked on vessels in San Francisco, Seattle, and Vancouver and sailed up the Yukon River to Dawson City. Others sailed to Skagway, trekked over the Chilkoot Pass, then rafted downriver to the goldfields.

Dawson City grew to be much bigger than it is today. There were 16 000 people in the town and perhaps another 16 000 in the hills around.



This photograph shows the first stores to be built in Dawson, in 1898.

Saloons, dance halls, and gambling casinos made Dawson City quite lively. The North West Mounted Police had a post, and nurses arrived and started a small hospital.

Soon the rush was over and the population dwindled. For several years, some mining carried on, but quick fortunes were no longer made. However, Robert Service helped to keep alive the legends of the Klondike by writing poems such as *The Shooting of Dan McGrew* and *The Cremation of Sam McGee*. These poems became world famous. We visit Robert Service's old cabin and watch an actor in period costume read some of his poems. It seems that we are actually looking in on a scene from 100 years ago.

We spend two days looking around Dawson City. We visit old buildings, including the Governor's mansion that is now an interesting museum. We hike through the surrounding area to see abandoned cabins and rusting equipment left from the gold rush. Some of it is overgrown with brush. We also see huge piles of waste, or tailings, left over after years of mining. These tailings are a blemish on the natural beauty everywhere else around, yet they form an interesting pattern when viewed from

the hills above. In the course of our visit to Dawson City, we learn that mining is still important to the Yukon. Gold, silver, lead, zinc, and copper have all been mined at various times when prices made it profitable.

From Dawson City we head south toward Whitehorse, the Yukon capital. Sixty-five per cent of the Yukon population lives in Whitehorse. Between Minto and Carmacks, our driver stops the bus. She points out a black bear and two cubs alongside the highway. We hurry to take pictures through the bus windows.

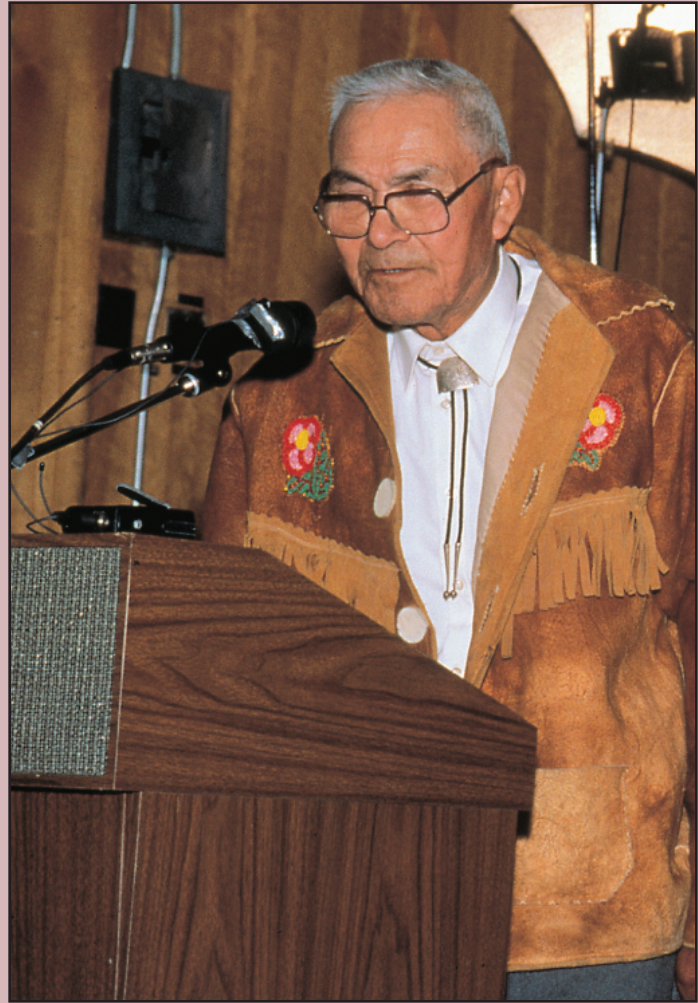
The driver says that the Yukon is well known for big game. She has seen moose, caribou, wolves, and black bears on her bus trips. Although she hasn't seen them herself, she says there are also grizzly bears and Dall's sheep.

As we continue the drive, Mr. Carpenter tells us that there is a place in the Yukon called Snag, situated about 200 kilometres west of our present location. In the winter of 1947, the temperature there dropped to -63°C , the coldest temperature ever recorded in Canada. He adds that Canada is the second coldest nation in the world. Only Russia is colder.

A Typical Aboriginal Land Claim Agreement in Canada

Land claim agreements have been signed in Canada to solve a problem that has arisen because of conflicting claims. The Government of Canada claims sovereignty over the land, while Aboriginal peoples claim ownership of much of the land by Aboriginal right. Various groups of Aboriginal people have agreed to sit at the table with the government to **negotiate** settlements of this issue that are acceptable to both sides.

Typical agreements include several elements. The Aboriginal groups acknowledge the sovereignty of the Government of Canada over the land; that is, they formally give up future claims to the ownership of land and resources. In exchange, the government acknowledges clear legal ownership by the Aboriginal group of specified areas of land within the lands they traditionally occupied, and the right of ownership of minerals in a relatively small area of land. The government also grants cash compensation for the loss of land; protection of traditional hunting and fishing rights throughout the traditional lands; and significant Aboriginal participation on various management boards, such as water, land planning, and environmental review boards.



Elijah Smith was an early activist for Aboriginal rights. In 1989, he helped bring about a land claim agreement in the Yukon.

When we get to Whitehorse we have a very busy time, but first we relax and enjoy a swim in the hot springs near the city. Later, we visit the SS Klondike, a sternwheeler that hauled passengers and supplies on the Yukon River. It is now an historic site.

The following day we visit the Council for Yukon First Nations offices. We learn about Aboriginal peoples of the Yukon and the challenges they face in preserving their cultures and languages.

We learn about Angela Sidney, who was awarded the Order of Canada in 1986. She was

the last of the Tagish people who spoke her native language and remembered the songs and stories of the past.

It is sad to think of her language dying out. We also learn about Elijah Smith, a former Elder and chief of the Kwanlin Dun First Nation Band. He was the first president of the Yukon Indian Brotherhood, the forerunner of the Council, and an early activist for Aboriginal rights. He helped to bring about the recent signing of the land claim agreement.

In the afternoon we visit the beautiful and



Sixty-five per cent of the population in the Yukon lives in Whitehorse.

modern Yukon Territorial Government building. A big abstract fireweed tapestry hangs in the legislative chamber. The fireweed is the Yukon's official flower. We also visit the art gallery. Two displays catch my eye. One is of cedar masks carved by a Tlingit artist. The other is a display of brightly coloured paintings depicting scenes of Yukon life.

In the evening, we attend a ceremony commemorating the anniversary of the Royal Canadian Mounted Police in the Yukon. There are two displays I like especially. One is about Superintendent Sam Steele who commanded a post in the Chilkoot Pass during the gold rush. He was famous throughout Canada even in his own time. The other display is about Inspector Francis Fitzgerald who was here during the gold rush. In 1903 he was sent north to Herschel Island. Americans had started whaling in the area in 1891. The Canadian government wanted him to ensure that Canadian authority was recognized and respected. Fitzgerald died between Fort McPherson and Dawson City in 1911

while leading what is now called The Lost Patrol. We saw his grave in Fort McPherson a few days ago.

The next day we leave the excitement of the Yukon and fly to Yellowknife, capital of the Northwest Territories. We cross several mountain ranges to get there. It is an awesome flight. As we clear the Mackenzie Mountains, Ms Bohnet tells us that we are above the Nahanni River and the famous Virginia Falls. Below is a dramatic canyon that has been named a world heritage site by the United Nations. I crane my neck until it hurts, but cannot spot the falls from my plane window.

In Yellowknife Mr. Carpenter introduces us to Amos Andrew, another representative of the Government of Canada. Mr. Andrew hosts us at a fancy dinner. He gives us information booklets about Canada and its history.

The next day we fly to the Tlicho village of Wekweètì (formerly Snare Lake), to learn about the Dene way of life. Wekweètì is a small village near



Describe the location of the treeline in Canada. (Discontinuous permafrost refers to areas where unfrozen ground is found between blocks of permafrost. Continuous permafrost refers to stretches of land where permafrost is uninterrupted.)

the treeline. Mr. Andrew tells us that the village is close to a gold mine on Contwoyto Lake. It is also near Lac de Gras, where prospectors have found diamonds in the 1990s. Several diamond mines are now operating in the area.

Mr. Andrew also tells us that Wekweèti is close to a dam that produces hydroelectricity for Yellowknife. He says that the Tlicho people have recently signed a contract to build another dam nearby to supply power to the Northwest Territories Power Corporation. They have concluded negotiations of a land claim agreement with the Government of Canada. *The Tlicho Land Claim and Self-Government Agreement Act* (2003) is a significant agreement in the history of relations between the First Nations people and the Federal Government.

The village people greet us when we land at the airstrip, then take us to their homes. They tell us that some Tlicho men have gathered to go on a community caribou hunt. We are invited to go along for part of the time.

The following day we fly in a float plane. It



The Bathurst caribou are part of the barren-ground caribou group. Choose one type of caribou shown on the map. Describe where it is found. Go to the library to find out about this type of caribou.

is my first time. It's exciting! We fly to a spot at the edge of the treeline. Here, the Bathurst caribou herd is beginning to move into its wintering grounds. We set up camp there.

In the evening, an elder tells us about the traditional importance of the caribou. In the past the Dene used caribou as a main source of food. They made weapons, tools, and fancy ornaments from bone and antler, and twine and thread from sinew. They made clothing, bedding, tents, and containers from hides.

He also describes the seasonal movements of the Bathurst herd. The caribou migrate south-



C
A
N
A
D
A



BASIC FACTS

Formal name: Canada

Common name: Canada

Area: 9 976 140 km² (second largest country in the world)

Area north of 60° latitude: 30% of total (est.)

Population: 33 390 141 (July 2007 est)

Life expectancy: males, 77; females, 84 (2007)

Ethnic mix: mostly European in origin (81%); Aboriginal peoples (2.6%); sizable minorities of people from many countries

Capital city: Ottawa

Population of capital: 812 129 (2006 est)

Other major population centres: Halifax, Quebec City, Montreal, Toronto, Winnipeg, Edmonton, Calgary, Vancouver

Government: a constitutional monarchy; a representative democracy with a parliamentary system; led by a prime minister and cabinet; the legislature has two houses: an elected House of Commons and an appointed Senate

Currency: Canadian dollar

Natural resources: coal, copper, gold, diamonds, lead, molybdenum, nickel, potash, silver, zinc, oil, natural gas, fish, timber, wildlife, hydro power.

Exports: \$464 billion US\$ (2007) —Energy products (natural gas, oil) minerals, automotive products, machinery and equipment, industrial materials, timber, newsprint, wood pulp, grain, fishing products; main destinations: US 81%, UK 2.3%, Japan 2.1%, China 1.7%, Mexico 1.0% and others

Imports: \$416 billion US\$ (2007) —crude oil, motor vehicles and parts, industrial materials, machinery and equipment, chemicals, durable consumer goods; main sources: US 54%, China 8.7%, Mexico 4%, Japan 3.9%, Germany 2.8% and others

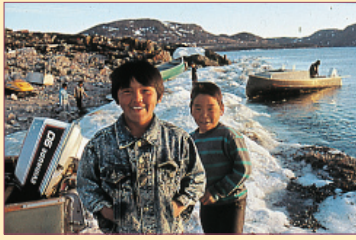
THUMBNAIL HISTORY

Aboriginal people have lived in the land that is now called Canada for many thousands of years. Evidence suggests that Dene and other Indians moved into the interior parts of northern Canada about 15 000 years ago; Inuit began moving into northerly and easterly coastal areas about 4500 years ago.

Vikings appear to have visited Newfoundland and perhaps Baffin Island about 1000 years ago. The British first came to Canada in 1497 CE when John Cabot landed in Newfoundland. The French, led by Jacques Cartier, followed in 1534. After early years of exploration and trade, Europeans began to live in colonies in what was then called The New World. The British and French often fought one another. In 1763 the British took control of the northern part of North America.

Several British colonies refused to join the Americans in the American Revolution of 1775-1783. These colonies joined together in 1867 to make the new country of Canada. In 1870, Britain granted

Canada control of all the British territories that had been claimed in the remote northwest. These lands became Canada's Northwest Territories.



Aboriginal people have lived in Canada for thousands of years. These Inuit children live near Cape Dorset, Nunavut.

Today Canada is a fully independent country, even though it has kept the British queen as the Queen of Canada. She is a figurehead and has no power over the

Canadian government.

Canada is made up of 10 provinces that stretch from the Atlantic Ocean to the Pacific Ocean. It also has three northern territories that touch on the Arctic Ocean. They are the Yukon Territory, the Northwest Territories, and Nunavut. Nunavut was formed in 1999 from a large part of the Northwest Territories and given its own government.



Park rangers help to preserve the wilderness in Canada's National Parks.



The Peacekeeping Monument in Ottawa



We land at the air strip at Wekweèti. This village is close to a gold mine and a hydro-electric dam.

ward from the northern barren lands in the fall. They spend the winter just inside the shelter of the treeline. In spring they begin their long, return journey northward to their calving grounds.

Long ago the Tlicho hunted caribou by walking or canoeing to the herd. They hunted with bows and arrows, or with spears if the animals were tangled in a trap or swimming across a river. Today hunters travel to the herd in metal boats with outboard engines, or on snow machines in winter. Or they may fly to the area in the fall, such as we have done, for a big community hunt. Their weapons are high powered rifles.

Caribou meat is still prized and used by every family. Caribou and moose hides are still used to make some garments, or parts of garments. Antlers are sometimes used for carving. Animals are not used as fully as they once were, however.



The Dene used caribou sinew to make thread and twine. Sinew, or tendon, is the tough, strong cord that joins muscle to bone. See Chapter 5 for a picture of caribou

The Tlicho, like other Dene and the Inuit, now live in frame houses and use canvas or nylon tents when they are camping. Many use nylon down-filled bedrolls, and parkas. Yet the caribou hunt is still an important part of their lives, even for people who have other jobs and can only hunt on weekends.

After listening to the elder, we gather around the campfire and talk for hours. As we are heading for our tents to sleep, we notice the northern lights dancing in the sky. We stop to watch. Perhaps it is because of the setting and the atmosphere in our camp, but we all agree that they look more beautiful tonight than ever before. Finally, overcome by tiredness, we go into our tents and climb into our warm sleeping bags.

In the morning it is cool; there is frost on the ground. We dress quickly, and have bannock and tea for breakfast. Suddenly we are called to the top of a hillside nearby. Running quietly, we reach the top. There before us are hundreds of caribou on the move, their hooves clicking as they walk! We hear the snorts and grunts of some adult animals and the bleating of calves.

I look toward the edges of the herd to see if there are any wolves. The elder said that wolves follow the herd for food, testing from time to time to see if they can spot weak, young, or careless animals. When they do, they cut them off from the rest of the herd and attack. I can't see any. Perhaps they see us, and are staying hidden among the sparse, thin trees on the other side of the clearing.

After we view the caribou for several minutes, Ms Bohnet signals that it is time to return to camp. The hunters want to move out toward the herd and we must be safe when the shooting begins. Johannes remains on the hillside. He wants



The northern lights, also called aurora borealis, are streamers of light that appear in the northern sky at night. The lights are caused by particles from the sun colliding with atoms from earth's atmosphere. The lights vary in colour from blue to red to yellow-green.

to stay and watch, but Ms Bohnet says no. The hunters will not begin until they know that we are safely back at camp.

After returning to Wekweèti, we spend another full day with Tlicho families learning about their traditional way of life. In the evening there is a happy celebration when the hunters return safely with a supply of meat. It will keep the community well fed right into the winter. The feast and drum dance goes on long into the night.

The next afternoon we return to Yellowknife and spend two days there. We tour the beautiful Legislative Assembly building. We read about Nellie Cournoyea, an Inuvialuk who was the first woman to become premier of the Territories and the first Aboriginal woman ever to lead a government in Canada. We also visit The Prince of Wales Northern Heritage Centre.

In the evening we attend a wonderful variety concert of northern performers at the Northern Arts and Cultural Centre. There are Métis fiddlers and reelers, Dene drummers, and Inuit throat-singers on the program. There is also a group called The



The territorial government of the Northwest Territories meets in these chambers in the Legislative Assembly building in Yellowknife.

Gumboots. They write and sing folk songs about the northern land, its history, and its people. The headliner is Dene singer Leela Gilday. She gives me her autograph.

The next day we fly by jet right across the Northwest Territories to Iqaluit in Nunavut, on Baffin Island. This is the largest community in the eastern Arctic.

Mr. Andrew tells us that the long runway in Iqaluit was first built by American forces during World War II. He says that this airport can handle even larger jets than ours. Sometimes planes making intercontinental flights stop in Iqaluit to refuel. Iqaluit is the main centre for air traffic in the Baffin Island region. Having well equipped air centres like this is important, Mr. Andrew says, because air transport is vital to nearly all arctic communities in Canada. It is vital because there are no railroads, very few highways, and the waterways are frozen for much of the year.

We are amazed at the distances we have covered already. We have travelled more than 1000 kilometres from Sachs Harbour, NWT to Dawson

City, Yukon and more than 3000 kilometres from Whitehorse, Yukon to Iqaluit, Nunavut. And we have not even set foot in the southern two-thirds of the country! Canada is the second largest country in the world. It is huge! This entire eastern part of the Canadian Arctic is called Nunavut. It was created in 1999 and has its own territorial government. It is still part of Canada. The majority of the people in Nunavut are Inuit. They handle many of their own affairs such as education, social services, and wildlife management. Iqaluit is the capital of Nunavut.

Driving into Iqaluit from the airport, we know for sure that we are now on the arctic tundra. There is not a tree in sight, and a light snow already covers the ground.

The community is built on the shore of Frobisher Bay. The bay is still free of ice and the tide is in. It is striking to see snow-covered rock right next to the dark water of the sea.

We are told that there are very high tides in Iqaluit, but we do not really appreciate what that means until later when we see the bay at low tide. Then the water lies more than a kilometre away



Leela Gilday is a Dene singer from the NWT who is well known across Canada

from the earlier shoreline. At low tide, we watch as heavy equipment off-loads barges that have been deliberately grounded on the beach. The mother-ship, where the barges get their supplies, is anchored far out in the bay.

After an enjoyable stay in Iqaluit we fly northward to the Inuit community of Pangnirtung on Cumberland Sound. We are going to visit Auyuittuq National Park, one of the most beautiful places in the Arctic. It is being preserved so that people can enjoy its natural beauty.

We spend a day in Pangnirtung before we travel to the park. It is a community of about 1000 people, located on an inlet. Towering hills rise directly behind it. Fjóla and I are taken to the home of Simon and Susannah Erkloo. They give us a cup of tea and warm biscuits. Then Simon takes us for a walk around the community to give us a sense of what it's like.

The land is covered with a light blanket of new snow. Some all-terrain vehicles, with fat little tires, whiz past us. Simon tells us that he likes riding them in the

summer. "But," he says, "I'm happy the snow is here. Freeze-up will soon come, and it will be time to get out the snowmobile. Then we can get some hunting done!"

As we walk around the hamlet, people wave and call out to Simon in Inuktitut, the language of the Inuit. It seems everyone knows and likes him. I notice that most people are wearing nylon down-filled jackets and woollen caps that are designed and made here. They haven't put on their warm winter parkas yet. But many wear traditional footwear, sealskin kamiks.

After our interesting tour, Simon takes us to the park office where we meet the rest of our group. The park manager says that we must obey our guide's every instruction when we are crossing the fiord to Auyuittuq Park. We are only going to hike for a short distance into Akshayuk Pass, yet there are hazards that we need to know about. We must bring extra supplies in case the weather turns bad and we get stranded. We must be especially careful crossing streams. To ensure our safety and to minimize damage to the tundra, we must stick to the regular hiking trails.



The airport in Iqaluit is the main centre for air traffic in the Baffin Island region. Air transport is important in arctic communities in Canada because there are few other transportation routes there.

“Will we meet any polar bears?” Jimmy Nevak asks, only half jokingly. “Not likely,” replies the manager. “They’re usually on the east coast of the park. Bears have never been seen in the fall in Akshayuk Pass.”

Simon says that polar bears are only around Pangnirtung at certain times of the year, and agrees we should not worry. He adds that local hunters have a yearly quota of about 14 bears they can shoot.

“I thought polar bears were an endangered species,” Niels says. “How can you hunt them?” Simon agrees that their numbers are limited, but says that the size of the total population is fairly healthy. Hunting is carefully controlled by the government and by hunters’ and trappers’ associations. There is no danger of them becoming extinct. Niels asks

a gymnasium for physical activities and community events.

There is a craft shop where local crafts are made and sold, a church, a small nursing station, a police station, a general store, and a hotel to accommodate tourists and business people.

Most homes in the community are built of wood. They have thick walls filled with fibreglass insulation. Windows have three panes of glass with air spaces in between them for insulation. Each home has a metal fuel tank outside. There are also water and sewage tanks inside each home.

Many homes are equipped with radios, televisions, DVD players, telephones and other modern appliances

A Typical Canadian Arctic Community

There is a municipal government. The mayor and council of the community meet to pass by-laws that govern such things as community zoning, local traffic, sanitation, and the keeping of animals. The municipality provides water delivery, sewage pump out, and garbage collection services. It has a grader for road work, a caterpillar, fire-fighting equipment, and other big trucks to do the hamlet’s work. There are garages to house and repair the heavy equipment.

There is a power house, where diesel generators produce electricity for homes, businesses, and street lights. Generator fuel is brought in on tanker ships every summer and stored in large “tank farms.” Producing electricity with diesel engines is expensive, but practical.

There is a small school with modern classrooms. It is equipped with books and supplies, computers, DVD players and multimedia projectors. It may have



This boys’ residence in Rankin Inlet has many modern conveniences.

THINK

What does this photo show you about student life in Rankin? Why do you think the author chose this photo? Rewrite the article “A typical Canadian Arctic Community” to describe your community. Select or draw a picture to illustrate student life in your community.



Polar bears are seen near Pangnirtung at certain times of the year. There is a healthy number of polar bears in this area because the government and hunters and trappers associations carefully control how many can be hunted.

what other wildlife is found in the area. Simon lists caribou, wolf, and fox.

As for marine life, there are various kinds of seal, narwhal, walrus, beluga whales, and killer whales. “In fact,” Simon says, “in the nineteenth century whaling ships often gathered around near-by Cumberland Sound to hunt the mighty bowhead whale. Inuit helped in these hunts; some became skippers of whaling ships.”

That evening Susannah takes us to a dance at the community hall. Following a traditional drum dance, a woman plays square dance tunes on a button accordion. Many people dance in the patterns their forebears learned from whalers long ago. We join them and have a lot of fun twirling and swinging about.

In the morning, just before high tide, we set out in motor-powered freighter canoes. To me the ocean seems grey, rough, and dangerous. But our Inuit guides look satisfied with things, so I try to relax. We speed to the head of the fiord, and soon

reach the park entrance beneath Overlord Mountain. The park warden greets us. Ms Bohnet confirms that we are to be picked up in two days on the other side of the fiord near the mouth of the Weasel River. We check our backpacks, swing them onto our backs, and begin our hike.

The scenery is overwhelming. High mountains tower above us. Ahead we see steep-walled cliffs and glacier-carved hanging valleys. The air is clean and fresh. The hike makes me feel very much alive. I am excited and happy.

It is late September, so there are equal days and nights now—12 hours of each. In the mountains the sun seems to set earlier than usual. It starts to get dark sooner than we expect, and we stop to camp. Our campsite gives us a great view of the fiord far below. As we set up camp, I notice that Niels and Mary are helping each other. They seem to like one another.

In the morning the weather has changed. Heavy clouds fill the skies. Blustering snow flurries

sweep over us from time to time. We continue our hike damp, and a little less lively than before. Fjóra keeps our spirits high by joking and singing.

By early afternoon we cross the Weasel River on the bridge at Windy Lake. I am sad that we are turning back already. I'd like to return someday and hike further through the park, perhaps even onto the glaciers.

The name Windy Lake sure fits. The wind is blowing hard. As we walk down the west bank of the river to the coast, it blows even harder. When we are ready to camp that evening, the wind is so strong that we have a rough time setting up our tents.

The wind howls through the night. When we get up in the morning, we suspect that the canoes will not be able to come from Pangnirtung to get us today. Pauloosie, our guide, reassures us. "We are absolutely safe," he says. Ms Bohnet suggests that we work on our notes and plan how to write our reports. We try as well as we can—in half-lighted tents that are flapping wildly in the wind.

Sure enough, when the high tide comes in we see clearly how rough the water is. Pauloosie confirms that we will not be picked up today. Hearing that, I suddenly feel sort of lost and abandoned.

I am so far from everything that is secure and comforting. I am homesick for a while. But I soon feel better as I listen to Pauloosie talk and watch him work quickly and well around the camp. We are in very good hands.

The next day the wind dies down. At high tide we all shout for joy when we see the canoes coming toward us. Seeing my friends' relief makes me realize that they must have been a little worried, too.

The ride back across the fiord is as rough as it was the day we came to Auyuittuq. But compared to the waves I saw the day before, I think I am sailing on smooth seas. I even relax and smile looking back at the beautiful scene we are leaving. I want to return someday.

In two days we are back in Iqaluit preparing to leave Canada. We had planned to visit Kuujuaq



Overlord Mountain towers over the entrance to Auyuittuq National Park.

schedule. We must move on to Greenland.

Mr. Andrew waves goodbye to us at the airport. Seeing him standing there reminds me of the many good people we have met already—people who have done so much for us. I am a little sad to think that I will not see most of them again. I have many thank you notes to write. I better get started now.



Cape Dorset, Nunavut



In 1999, Nunavut was formed from a large part of the Northwest Territories. The majority of the people in this territory are Inuit. The name Nunavut means “Our Land.”



Pangnirtung Fiord

WEB-BASED RESOURCES

eLibrary (password protected)

<http://elibrary.bigchalk.com/libweb/canada/do/login>

NWT access - Username: govont0201 Password: elca

CultureGrams (password protected)

<http://online.culturegrams.com/>

NWT access - Username: govnorthwest Password: welcome

Statistics Canada :

<http://www.statcan.ca/english/edu/students.htm>

Parks Canada:

<http://www.pc.gc.ca/>

Government of Canada: About Canada

<http://canada.gc.ca/acanada/ViewCategory.htm?lang=eng>

Prince of Wales Northern Heritage Centre

<http://pwnhc.learnnet.nt.ca/>

Government of Yukon: Kids Zone

<http://www.gov.yk.ca/kidszone.html>

Government of Nunavut

<http://www.gov.nu.ca>

THINK

Some people say that more parks should be created, and that strictly controlled tourism should be the only economic activity allowed in them. Evaluate this point of view.

CREATE

Create an effective ad to persuade tourists that they should come to visit your region,

SEARCH

As you explore chapters 2 – 10, imagine that you have won a trip to visit four countries in the Circumpolar world. You have two weeks to complete your voyage. You must now decide where and when (time of year) you want to go, how will you get there (transportation), how much time you will spend in each place, and what you will do at each location. On your trip you will document the climate, geography, and culture at each location you visit. Create a travel log to record your journey.

Greenland

CHAPTER 3



This is a photograph of a coastal town called Ilulissat. Look at the map on the facing page. Where do you think most Greenlanders live?

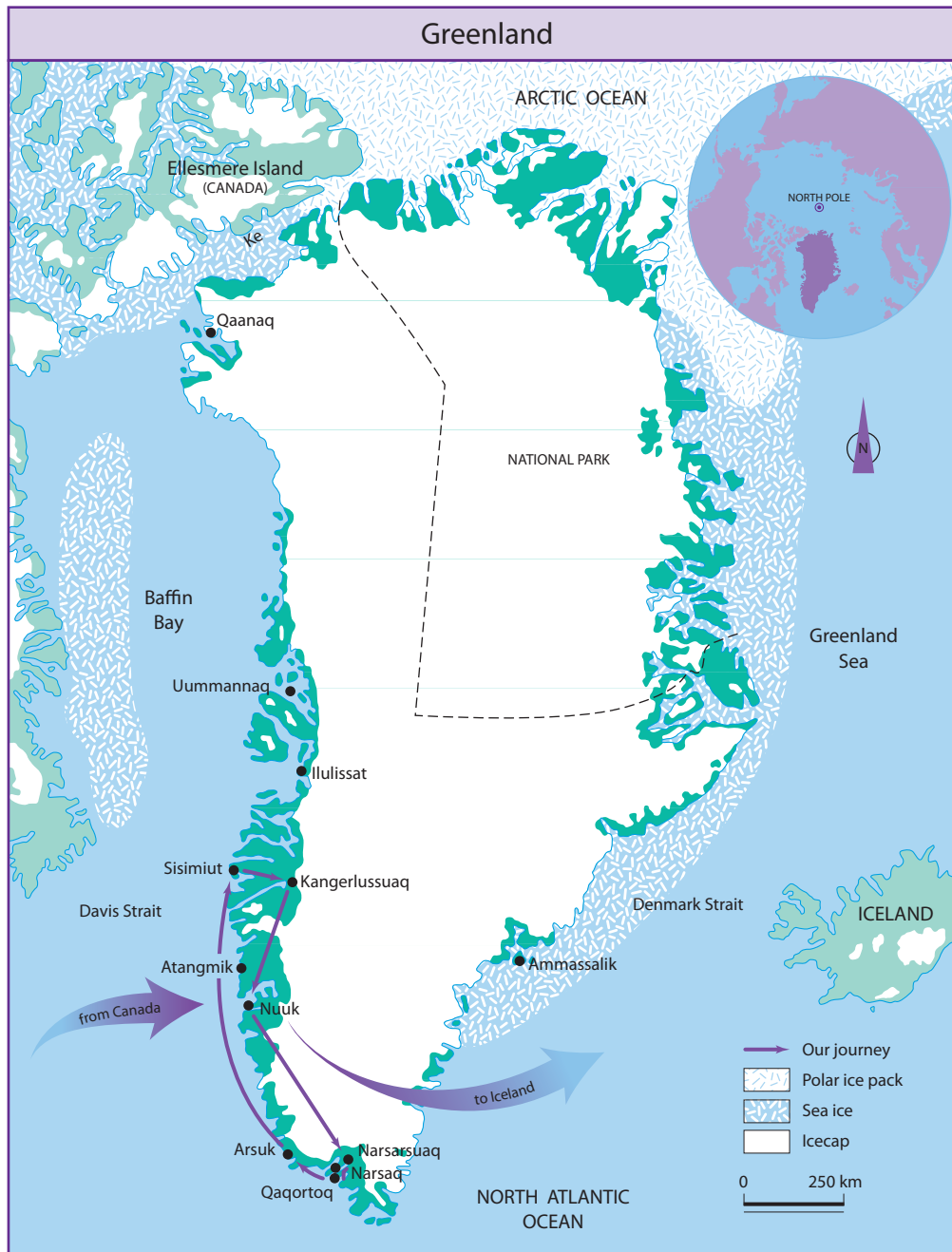
We leave Iqaluit October 1 and fly to Nuuk, Greenland's capital. The flight across Davis Strait is short. Greenland is close to Canada. It is only 26 kilometres across Kennedy Channel near the northern end of Ellesmere Island.

There is snow on the ground when we land. The weather is much like it was in Iqaluit, grey sky covered by high cloud. The temperature is not much below the freezing point, though. Perhaps the snow will melt later today.

Louise Miteq, representing the Greenland Home Rule Government, and a Danish official, Lars Jensen, welcome us at the airport.

They give us envelopes containing information and lapel pins. Mr. Jensen laughingly tells us that if we don't like the weather, we need only wait an hour or two. The weather is very changeable along the southwest coast of Greenland.

Ms Miteq tells us about things we will notice over the next few weeks. Inuit live in the northern and eastern parts of the island. Danes also live and work in Greenland. Most people are a mixture of Inuit and Dane. Recent census data show 88% of the population is Greenlandic and Danish and others make up the other 12% (2000). Some look more like Inuit and some look more Danish, but they are



We will make a circular trip in Greenland. We'll start out at Nuuk and end up there, too. But there is a lot to see in between.

all Greenlanders, she says, and that's what they like to be called. The language they speak is Greenlandic. It is actually the Inuit language with some Danish words added.

Ms Miteq tells us that Vikings named Greenland long ago. There is hardly any green on the island—only on the coastal areas in the summer, particularly in the inner fiords. But the first Vikings called it Greenland to encourage other settlers to come. They might also have really considered it green in contrast to the dark volcanic rock of Iceland where they had lived before.

We spend the next several days learning

about the lifestyle of the people of Nuuk. Some of us find it similar to the lifestyle we are used to at home. We see much evidence of the aboriginal origins of most people. It is in their language and the soapstone and ivory carvings. It is in the drums we see. (We learn that drum dancing is still popular.) It is also in the country food most families eat. Jens and I eat seal meat at Lief and Bibi Olsen's, where we are billeted. The seal came from their relatives who live in Atangmik. Seal hunting has always been the basis of existence for the Inuit in Atangmik—and it still is for the population of most settlements.



GREENLAND



BASIC FACTS

Formal name: Kalaallit Nunaat

Common name: Greenland

Area: 2 186 000 km²

Area north of 60° latitude: 99% (est.)

Population: 57 000 (2007)

Life expectancy: male, 66; female, 74 (2006)

Ethnic mix: the majority are Greenlanders (a mixture of Inuit and European immigrants); some Inuit, some Danes

Capital city: Nuuk (formerly Godthab)

Population of capital: 15 000 (2007)

Other major population centres: Sisimiut, Ilulissat, Qaqortoq

Government: a Danish colony until 1953, Greenland then became a province; it attained home rule in 1979 and began full self-government in 1981. Greenland has a constitutional monarchy; a representative democracy with a parliamentary system; led by the Danish high commissioner, the home rule prime minister and cabinet; the legislature is comprised of one elected house, the *Landsting*

Currency: Danish krone

Natural resources: coal, cryolite, iron ore, lead, molybdenum, platinum, uranium, fish

Land use: croplands, meadows, pastures, 1%; forests and woodlands, negligible; other, 99%

Exports: \$408 million US\$ (2004) —fish and fish products 94%; main destinations: Denmark 62%, Japan 12%, China 5%, Spain 5%

Imports: \$601 million US\$ (2004) —petroleum products, manufactured goods, machinery and transport equipment, food and live animals; main sources: Denmark 67%, Sweden 19%, Ireland 4%



Scoresby Sund in East Greenland, the longest fjord in the world.

THUMBNAIL HISTORY

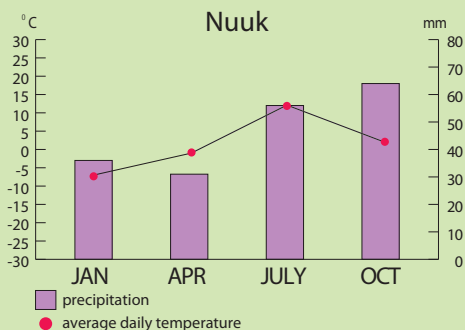
Irish monks may have been the first to visit Greenland, beginning in the sixth century CE. The Viking, Erik the Red, and his wife Tjodhild, led a group of Scandinavian settlers to Greenland from Iceland between 980 and 985 CE. They established the first European colony in Greenland. Leif

Eriksson, Erik and Tjodhild's son, brought Christianity to the area in 1000 CE. It was around this time that Inuit of the Thule culture moved into northern Greenland from Baffin Island.

After struggles with other Scandinavian countries, Denmark took control of the Norse colonies in 1380 CE. The colonies died out a few years later, perhaps because of a long period of very cold winters made even worse by trade problems. Conflicts with Inuit might also have played a minor role.

In 1721 a Norwegian missionary, Hans Egede, started a Lutheran mission in Greenland with the permission of the Danish government. This brought Scandinavians back to the area again. In 1729 the Danish government officially took control of the new colonies and has maintained control since.

The Germans conquered Denmark in 1940. During the remainder of World War II, the United States occupied Greenland to stop the Germans from taking it. The Danes took control of the island again in 1945, but the Americans were allowed to keep military bases there. Denmark granted Home Rule Government to Greenlanders in 1979.



These Greenlandic children go to school in Sisimiut.

The number of seals in East Greenland is unknown, but the seals are very common. About 10,000 seals are caught annually, either by nets that are placed under the ice or by rifle. It is delicious!

At an outdoor market near the waterfront, called "**Brættet**", (which is the local word for "open", we find hunters and fishers selling fresh fish and cuts from marine mammals. Later, in the supermarket, we find frozen country foods for sale: whale and seal meat, birds, fish, shrimp, and scallops. There is lamb and mutton, too, brought in from farms in the southern part of the island.

Besides seeing so much traditional culture in Nuuk, we also notice much that is modern. Most adults work full-time in stores or offices. They live in modern homes in big apartment complexes.



Farms like this one near Narsaq can grow hay, barley, potatoes, cabbage, and beets. Most farmers are sheep farmers.

They have stylish Danish furniture, television, high speed internet, and sound systems in their homes. Everybody seems to like music, whether it is folk songs, pop songs translated into Greenlandic, or modern rock.

People our age wear blue jeans and sneakers to school. They play sports, watch videos, access internet sites, and listen to rock music on portable MP3 players and iPods. They live much like the people in our group.

One evening, the Olsens take us to see a performance by *Silamiut*, a professional theatre company.

The company has a small stage at a com-



This photograph shows the National Museum in Nuuk near the shore, with apartments on the hill above.

munity centre in a suburb of Nuuk. They perform traditional legends in a style of modern song and dance. I really enjoy their performance.

During our stay in Nuuk we also visit the National Museum. There we enjoy a display on the life and work of Greenlander Knud Rasmussen. Some interesting artifacts have been borrowed from the museum in Ilulissat, Rasmussen's birthplace. Rasmussen and some Inuit companions, Arnarunnguaq, a woman, and Miteq, a man, travelled extensively across Greenland, northern Canada, and Alaska in the early part of the twentieth century. Rasmussen documented Inuit lifestyles, and published his accounts.

There is also a display telling about Inuit mummies (Qilakitsoq Mummies Display) that were found frozen in the ice. They date from the 1500s. These displays lead us into some very interesting discussions about the traditional life of Greenland's Inuit.

We learn that the Inuit culture is still strong here. Every summer it is celebrated at a gathering called *Aasivik*. Hundreds of Inuit gather in a tent village to have serious discussions about topics important to them. They also celebrate Inuit culture in song, dance, and drama.

The night before we leave Nuuk, we attend a dance at the high school. The students are friendly and we all have a happy time. Unfortunately, Niels and Johannes argue about whether Denmark

should maintain partial control of Greenland. I'm afraid they might even start to fight, but Jens steps in and helps them calm down. Before the evening is over everything seems to be normal again in our group.

The following morning, we fly to Narsarsuaq near the southern tip of Greenland. The flight takes us across the edge of the icecap that covers much of the island. Our guide tells us about Greenland and its great cover of ice.

He says that Greenland is the largest island in the world. Australia is actually larger, but it is usually thought of as an island-continent. Greenland is made up of a central plateau that is



This sculpture, which is housed in the National Museum in Nuuk, shows an eastern Greenlandic woman.

ringed by mountains around the coastline. The central plateau itself is covered by an icecap, left over from the last ice age which ended about 10 000 years ago.

Our guide also tells us that although the icecap seems forbidding, it can be successfully crossed by those who are prepared. The first recorded crossing was by Fridtjof Nansen in 1888. He did it on skis. Today it is crossed several times each year, often between Kangerlussuaq and Ammassalik.

As we near Narsarsuaq, the icecap ends. The coastal area is free of ice and is deeply cut by

fiords. This is typical of the entire coastal area, our guide says. The mountains are more rounded here than they are in other coastal areas of the country.

When we land, we discover that this inner fiord area in the southwest is the mildest part of the island. It is the only area where permafrost, which underlies much of the arctic land mass, is absent. Only about one per cent of the entire island is suitable for agriculture. We board a small vessel and during the next few days travel the inner fiord area to Narsaq and Qaqortoq.

This southern part of the island becomes green in the summer but it is not green now. We

GREENLAND'S ICECAP

Greenland's icecap covers more than 80 per cent of the island. The icecap is maintained by falling snow. The weight of the fresh snow melts the snow underneath it and then cold temperatures turn the melt-water into ice. The ice builds up in the middle of the island. The great weight of the ice then causes it to spread slowly outward to the coast.

The icecap is huge. It averages 1500 metres thick and is 3400 metres thick at its deepest point. Its weight is so heavy it presses the earth's crust down and bends it. Because of this weight, the land beneath the ice in central Greenland has sunk to a depth of 365 metres *below* sea level. If the icecap ever melted, the land beneath it would rise to about 900 metres *above* sea level. In addition, the level of all the oceans would rise by about 6 metres, thus flooding coastal cities like New York.



Greenland's icecap is 3400 metres thick at its deepest point.

see brown grasses peeking through the light snow covering. The crops grown here are limited because of **climate** and soil, but Greenland is feeling the effects of global warming as rising temperatures have expanded the island's growing season and crops are flourishing. For the first time in hundreds of years, it has become possible to raise cattle and start dairy farms. Hay, barley, potatoes, cabbage, and beets are just some of the successful crops being harvested. Some farmers keep hens and goats, but most are sheep farmers. The rural lifestyle here is quite different from the lifestyle in Nuuk, but it is not traditionally Inuit, either. Fjóla says it reminds her of some areas in Iceland.

We then board a larger vessel that carries freight and passengers. It takes us on a journey up

ICEBERGS

At some points the ice of Greenland's great icecap moves through passes in the mountains. These moving channels of ice are called *glaciers*. When glaciers reach the sea, huge chunks of this fresh-water ice break off and float away. This is the birth of icebergs. The process of giving birth to icebergs is called *calving*. As a result of calving, there are hundreds of icebergs in Greenland's coastal waters. The world's most active glacier, producing countless icebergs, is found at Ilulissat. This glacier calves across a front 10 kilometres wide. You often will see icebergs more than 100 metres above the water's surface at Ilulissat. (Only one tenth of icebergs show above the waterline.)

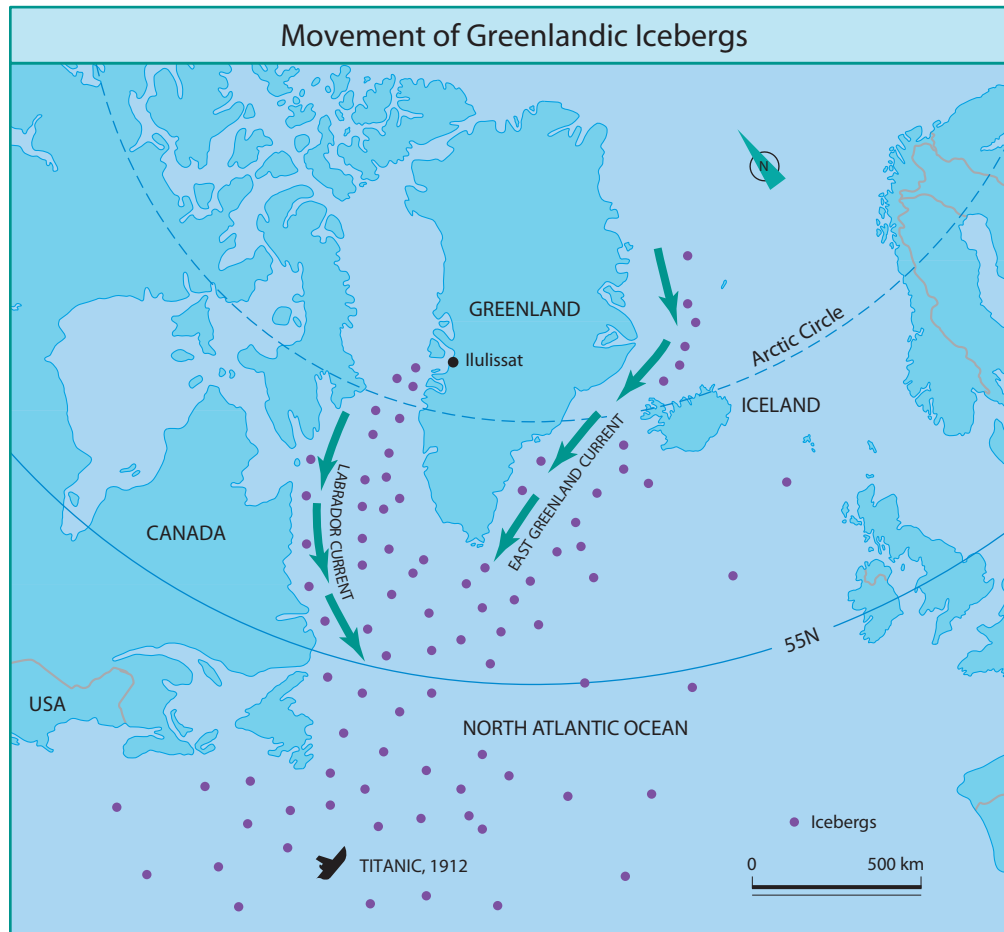
Once in the ocean, icebergs are carried by currents, especially the Labrador Current and the East Greenland Current. They may travel thousands of kilometres from their starting point and last two or three years before they melt. About 1000 icebergs cross the 55th parallel in a southward journey every year. They have even reached Bermuda.



Mountains along Greenland's coastline surround the icecap on the central plateau. This photograph, taken in June, shows water from the icecap trickling down a mountain toward the ocean below.



Icebergs are a common sight at the harbour in Uummannaq.



Once in the ocean, icebergs are carried by currents and may travel thousands of kilometres. The Titanic was a ship that sunk after it hit an iceberg off the Canadian coast in 1912.

the west coast. The weather is overcast and the water is rough. We see occasional icebergs. I'm nervous, and a little seasick, but the boat handles the waves easily enough.

The coast is bleak, rugged—and beautiful. Here and there along the coast a small village is perched on a shelf right next to the sea. The mountains rise up behind it. Beyond the mountains—although we cannot see it now—lies the great ice-cap. In most cases there is not even room along the coast for airport runways or for roads. People rely on boats or helicopters to travel to other villages. Snowmobiles may be used in the winter. Fortunately, people can easily keep in touch with one another using modern communication services.

The sea plays a very important part in the lives of the village people, just as it did traditionally with the Inuit. Ms Miteq tells us that the sea has always provided greater wealth for the Inuit than the land. We learn that the people in these villages fish

and hunt seal for food. Some trap white and blue fox and sell the furs for cash.

Many also work full time in the commercial fishing and fish processing industries to earn their incomes. Cod and shrimp are the main focus of these industries.

In the village of Arsuk there are many brightly painted homes. At rest in the picturesque harbour there are trawlers strung with heavy lines and bulging pink floats. Near the edge of the village, there is a busy, modern fish plant. Eventually we reach Sisimiut, just north of the Arctic Circle. It is the second largest municipality in Greenland. It is very exciting when we disembark. There is a crowd at

the dock. We would like to think that the people have come out to see our arrival, but experience has already shown us that this is a regular occurrence in coastal villages. When the ferry arrives, people gather at the dock to see which of their friends and relatives have come to town.

We spend a few wonderful days with the people of Sisimiut. We learn that the town was named Holsteinsborg by the Danes, but the people who live here prefer to use its Greenlandic name, Sisimiut. Ms Miteq tells us that the capital, Nuuk, was once called Godthab by the Danes. This name was changed when the Home Rule Government took control of the island.

To return to Nuuk, we first fly on a helicopter to Kangerlussuaq. It is my first helicopter ride. What an experience! It is thrilling and scary at the same time. I can't quite believe the twirling blades will keep us up in the air, so I'm on edge the whole time.

Greenland's Economy



Fish processing industries are a source of jobs. These workers are in a shrimp processing plant.

The **economy** of Greenland is a challenge for the Home Rule Government. Greenland buys much more from other countries than it is able to sell to them. Canned, frozen, and salted fish is one of the few things Greenland sells to other countries. It also mines and sells cryolite which is used in making aluminum and glass. It is possible that deposits of lead, zinc, and gold can someday be mined at a profit, or that large amounts of oil might be found offshore. But that is for the future. Meanwhile, Greenland imports many costly goods such as fresh foods, machinery, transportation equipment, lumber, and fuel.

Greenland Home Rule Government

The Greenland Home Rule Government is a government of Greenlanders elected by Greenlanders. It makes laws about matters such as education, cultural affairs, wildlife management, agriculture, economic development, environmental protection, the regulation of business, social welfare, and health care. But Greenland is not a fully independent country. It is semi-independent, still subject to certain laws of Denmark. The Danish government keeps the power to make decisions for Greenland about the defence of the island and about matters that involve Greenland's relations with other countries. It also gives an annual grant of several hundred million dollars to help the Greenland government pay for its programs. Greenlanders send two representatives to sit in the Danish parliament.



This photograph shows a procession of members of the Greenland Home Rule Government. They are going to an old church in Nuuk before convening a new session of the assembly.

After we land safely in Kangerlussuaq, we transfer to a DASH 7. Soon we are back in Nuuk.

It is the end of the third week in October. The days are getting shorter. Winter has definitely set in. As we learned earlier, the southwest corner of Greenland is the warmest area on the island. Yet even here the temperature is now below zero. We are told that in the interior (where in July temperatures average -12°C), the temperature today is -30°C . I'm glad we're not stranded out on the icecap somewhere!

After hugs and kisses at the airport, we board our plane for Iceland. When we are in the air, we can clearly see the size of the massive icecap below.

We hadn't really appreciated its full effect when we flew over its edge travelling to Narsarsuaq. It is surely one of the wonders of the world.

THINK

Consider why Aboriginal people want to change some place names in the circumpolar world. Consider the different point of views on whether or not to change the name of the Northwest Territories. Take a position on this issue and organize a class debate.

WEB LINKS

eLibrary

Address: <http://elibrary.bigchalk.com/libweb/canada/do/login>
NWT access - Username: govont0201 Password: elca

CultureGrams

Address: <http://online.culturegrams.com/>
NWT access - Username: govnorthwest Password: welcome

CIA Factbook

<https://www.cia.gov/library/publications/the-world-factbook/>

Greenland.com

<http://www.greenland.com/>

Greenland Expo

http://www.greenlandexpo.com/content/us/about_greenland

Our Greenland

<http://www.torrak.org/index.html>

Iceland

CHAPTER 4

The flight does not take long. Iceland is only 290 kilometres east of Greenland. When we arrive, the southwestern part of the island is covered in cloud. Our descent through the cloud is very rough. I keep hoping for a break in the cloud so I can see where we're going. When I finally make out the airport below, I relax a little. Minutes later we land safely at Keflavik airport.

Walking to the terminal, I notice that the weather is warmer than it was in Greenland. But a strong wind is blowing. This does not surprise me because, preparing for the trip, I read about Iceland's weather. It is not as cold as most other places this far north. Summers are mild rather than hot and winters are cool rather than cold. Because Iceland is an island, the ocean moderates the climate. This marine influence is even greater because the warm Gulf Stream from the Caribbean Sea washes the shores of the island. This warm current usually helps to keep Iceland's ports open all year round.

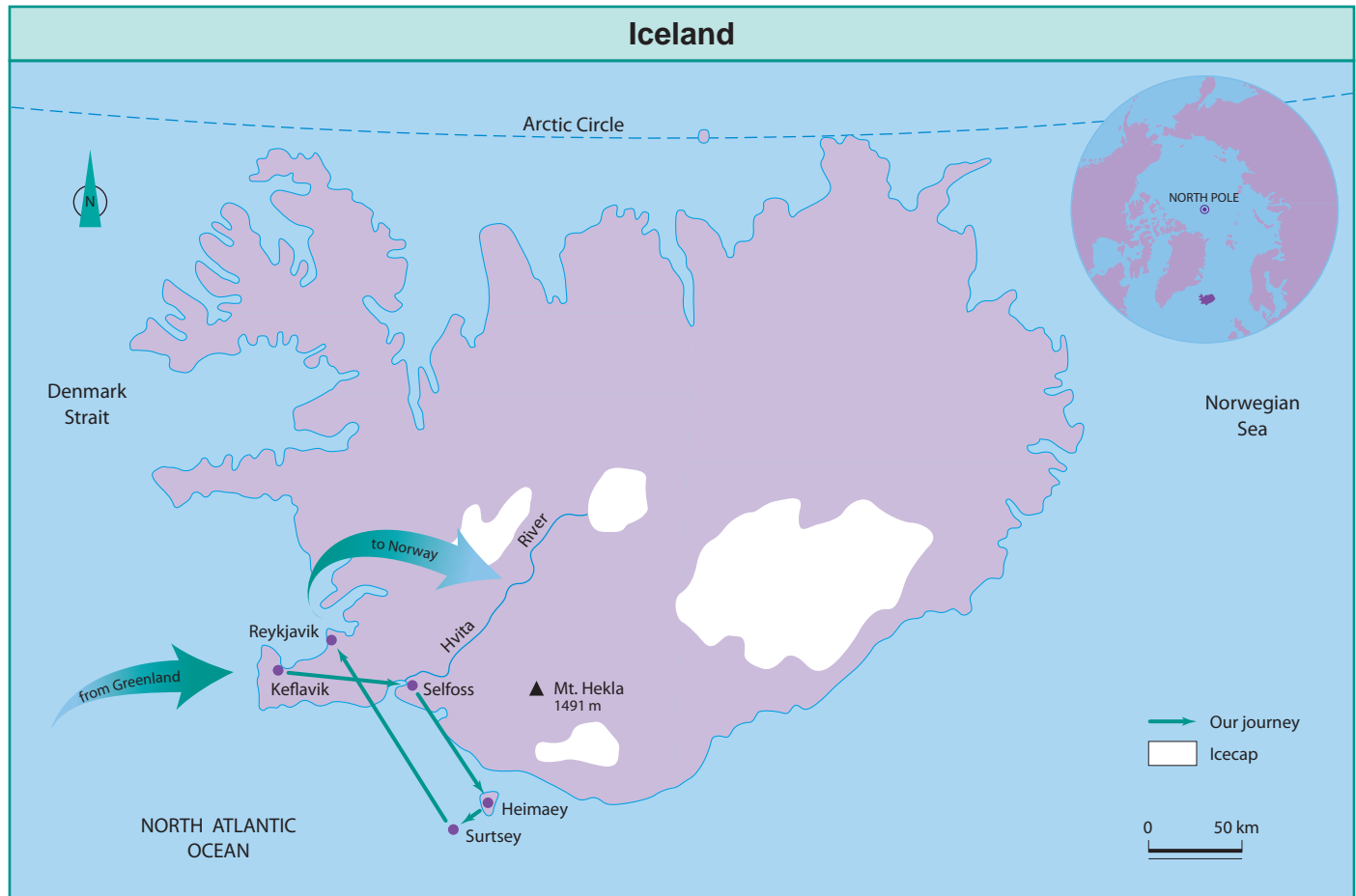
In the airport, Steinn Kristinsson greets us on behalf of the Government of Iceland. He



Fishing is an important part of Iceland's economy. This fishing vessel uses sonar to find fish.

welcomes us to the westernmost country of Europe, to "the land of ice and fire." He gives us information packages, then divides us into two groups. The first group will visit the western part of the island. I am with the second group that will travel to the south-central region.

We are driven to farm homes in a fertile plains area east of Selfoss. It is the best farming area in a country that does not have much good farm land.



We will land at Keflavik first. After seeing Selfoss, Heimaey, and Surtsey, we will end up in Reykjavik.

THE LAND OF FIRE AND ICE

Iceland is given this name because both glaciers and volcanoes are found on the island. There are areas of craters, of black lava deserts, and of jagged mountains covered with ice and snow. Icefields take up 12 per cent of the land. Lava beds take up another 11 per cent.

Virtually all of Iceland lies between 60°N and the Arctic Circle. This helps to explain the snow-capped mountains and glaciers.

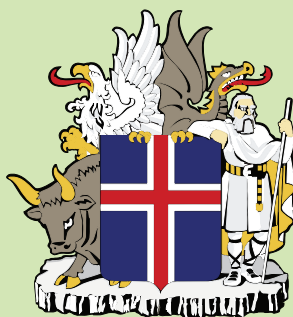
Iceland lies on a fault line, the Reykjanes Ridge, which is a break in the earth's crust. This break allows an outflow of energy and matter from beneath the earth's crust. This outflow shows itself on the surface of the island as volcanoes, lava flows, geysers, hot springs, and boiling mud pots. The area is also subject to earthquakes.



This house has been partially buried by volcanic ash. Lava beds take up 11 per cent of Iceland.



I C E L A N D



BASIC FACTS

Formal name: Republic of Iceland

Common name: Iceland

Area: 102 819 km²

Area north of 60° latitude: 100%

Population: 300 000 (2006)

Life expectancy: male, 79; female, 83 (2005)

Ethnic mix: almost entirely Icelandic, a homogeneous mixture of descendants of Norwegians and Celts; there is not an aboriginal population

Capital city: Reykjavik

Population of capital: 116 000 (2006)

Other major population centres: Akureyri, Kopavogur, Hafnarfjörður

Government: a republic and a representative democracy; the country is led by a president who is elected by direct popular vote for four year terms, and by a prime minister and cabinet; the legislature is comprised of one elected house, the Althing (the oldest continuous national parliament in the world)

Currency: Icelandic krona

Natural resources: fish, hydro power, geothermal power

Land use: croplands, 2%; meadows and pastures, 22%; woodlands, 1%; unvegetated areas, 58%; glaciers and waters, 17%

Exports: \$19.9 billion US\$ (2005) —fish and fish products 41.8% - this figure varies considerably from year to year due to the fluctuation and decline of ocean fish stocks; animal products 1.9%; manufacturing products (aluminum, diatomite, ferrosilicon) 62%; printing and publishing 32% ; **main destinations:** EU 69% (Germany 15.8%, UK 17.8%, Netherlands 12.5%, Spain 6.9%), US 8.4%

Imports: \$17.7 billion US\$ (2005) —machinery and transportation equipment, petroleum products, foodstuffs, textiles;

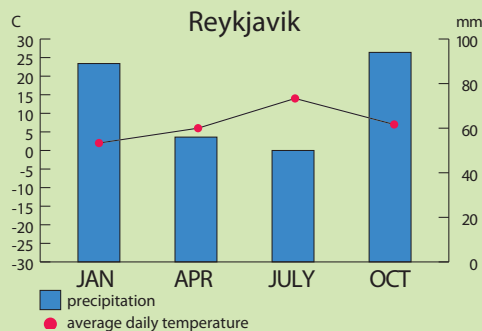
main sources: EU 53% (Germany 12.6%, Norway 9.6%, Denmark 7.6%, UK 6.8%).

THUMBNAIL HISTORY

Irish monks appear to have been the first visitors to Iceland. They were followed about 870 CE by settlers from Norway and from Viking colonies in the British Isles. The “Book of Settlements,” listing 400 settlers, their family connections, places of origin, and homestead locations, still exists. Descendants of these people later settled Greenland. They also made attempts to set up colonies in North America, which eventually failed.

The population of Iceland reached 25 000 in 930 CE. That is when the Althing was established. It is the world’s oldest parliament and it is still in operation today. Iceland has a long history of being democratic.

Iceland was an independent state until 1262 CE, when the Norwegian crown took control of it. Next it became a Danish colony when Denmark took over in 1380 CE. Iceland continued as a Danish possession for nearly 600 years. In 1918 it was finally recognized as a self-governing kingdom within Denmark. When World War II broke out in 1939, German troops occupied Denmark. Because Iceland is in an important location to control shipping on the Atlantic Ocean, British, and later American troops, occupied Iceland to prevent the Germans from taking it over. Iceland took advantage of this situation to declare its complete independence from Denmark in 1944. More than 90 per cent of Icelanders voted in favour of independence. Aboriginal migrations did not extend as far as Iceland. Moreover, there has been little immigration since the island was first settled in the ninth century CE. Most of the population is therefore made up of the descendants of a single group of people. Thus, most Icelanders are similar to one another in physical appearance, culture, and language.



These Icelandic fishermen are preparing their boat in the Reykjavik harbour.

I am paired up with Larisa Yakovlev this time. For nearly a week, we will live with Pétur Stefánsson and Vigdís Jónsdóttir and their children, Thor and Kristín.

“In Iceland, you call us all by our first names,” Pétur says. He explains that people have a personal first name, but do not have family names. The second name relates to the person’s father. Pétur’s father was named Stéfan Valgardsson, so he is Pétur, Stéfan’s son. Vigdís’s father was named Jón Sigvaldason, so she is Vigdís, Jon’s daughter. Women do not change their names when they marry.

We have a wonderful week at the farm. It is mainly a sheep farm, as are many of the farms in Iceland. The climate and soil don’t support grain farming. By now, the third week of October, most of the autumn work has been done. Sheep have already gone to market. The large garden harvest—potatoes, turnips, beets, carrots—is stored for winter.

There are still sheep to be moved to different meadows, and the cows must be milked and fed. House cleaning, preserving, and cooking must be done, too. After a breakfast of milk, cheese, blood sausage, and eggs, Larisa and I help with the chores. Then we spend wonderful afternoons riding long-haired Icelandic ponies across the hillsides, watching ravens play games in the ever-present winds, and fishing for salmon in a swift stream. I am very proud when I catch a salmon—three kilograms! Vigdís cooks it for supper.

The evenings are wonderful. Vigdís brings out her knitting and we all gather round to talk. Pétur tells scary stories about the hidden folk who are believed to live in the countryside throughout Iceland. Vigdís and Kristín write poems and read them to us. Larisa and Thor play chess. Larisa surprises everyone, except herself, by winning. I’m impressed! She and I spend some quiet time making notes and thinking about the reports we will eventually write.

One evening Pétur brings out a well-worn book. It is written in Icelandic. The Icelandic language is much like the Old Norse language that was spoken 1000 years ago.

Icelanders can still read Old Norse if the spelling is modernized. Pétur's book is called *Njal's Saga*. It was written by an unknown Icelandic author in the late thirteenth century.



We spent afternoons riding long-haired Icelandic ponies, like these.



A geyser is a spring that spouts a column of hot water and steam into the air at intervals. The Geysir in Iceland sends hot water about 59 metres into the air.

Pétur says that many Icelanders enjoy reading modern versions of stories and poems that are 800 or 900 years old.

Pétur reads from the book and translates it into English as he goes along. It is a tale of a hero, Njal Thorgeirsson, and a family feud that lasted for 50 years. We only hear part of the story before it is time for bed. The saga sounds interesting. Larisa and I decide we'll follow it up later.

The evening before we leave, we are treated to a tasty Icelandic feast. We have fresh, boiled salmon, delicious smoked mutton, mounds of vegetables, fresh bread, home-made butter, and cheese. Finally we have a delicious dessert called *skyr*. It is made from milk curds and served with sugar and cream. It is hard for Larisa and I to say farewell to this wonderful family.

We had planned to visit Heimaey, a small island, to learn about the commercial fishing industry. But the wind is blowing even harder now. There is a violent storm over the sea and six metre waves are tossing ships around like toys. Our host, Mr. Kristinsson, postpones that part of the trip until later. Instead we see other interesting sights over the next few days.

First we go to one of the most famous geysers in the world. It is famous because it gives its name to all the others. It is called *Geysir*. It spouts hot water about 59 metres into the air and, believe me, that's something to see!

Then we go to the river Hvita. In Iceland there are many short, swift-flowing rivers formed by heavy rainfall and melting glaciers. Ships can't travel on any of these rivers to carry freight. But many rivers are the kind that can be used to produce hydroelectricity, a potential that is being developed as Iceland tries to build up industry to overcome its reliance on fishing. Whitewater rafters and kayakers also like the challenge of paddling on some of these rivers. Tourists come to Iceland from many countries to paddle its rivers, hike on its glaciers, or view its spectacular scenery.

We see spectacular scenery on Hvita. *Gullfoss* is on this river. Some say it is the most beautiful waterfall in the world. I can hardly take my eyes off the sparkling water as it tumbles down over the rocks.

In the distance, we also see a famous volcano named Mount Hekla. Mr. Kristinsson says it has erupted many times in the memory of people still living. It erupted last in 1991. Unfortunately it was not active when we were there. I know I would have been nervous if it was rumbling and smoking, but I would like to have seen it anyway.

Finally the strong winds die down and we go to the island of Heimaey. There we board a large fishing vessel and take a tour around it. We visit the wheelhouse and see cables, winches, and nets rolled up on the deck. We see the galley, the crew's quarters, and the fish cleaning and storing areas. The smell of fish and fuel on a lower deck makes us wrinkle our noses.

Before we put out to sea, the captain contacts the National Lifesaving Association. They will help us if we run into trouble. We are not going to fish. The captain says that would be too dangerous with young people on board. Rather,



One popular tourist site in Iceland is Gullfoss, a waterfall on the Hvita River.

we are just catching a ride to the capital city, Reykjavik, where the captain will pick up some new equipment.

We are sailing under a clear, blue sky. Gulls follow us. I suppose they recognize the boat and think they'll get a taste of some fresh fish when the nets are pulled up. They will be disappointed. Anyway, they are beautiful gliding along with their white wings spread against the blue sky.

We go far out of our way to circle around one of the newest places in the whole world. It is the small island of Surtsey. Because of volcanic activity, lava rock started coming up out of the sea in 1963.

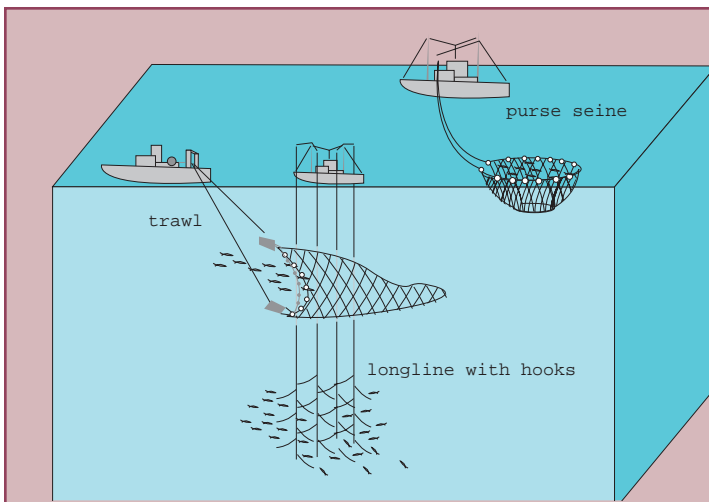
Fishing in Iceland

Fishing has always been an important part of Iceland's economy. Fish products and herring, cod, and haddock make up about 80 per cent of Iceland's exports.

As in many other countries, Icelandic fishers use sonar to find fish. In their fishing fleet there are big trawlers that drag fish nets along the bottom of the ocean. There are other vessels fitted with purse seine nets that trap schools of fish near the surface. Smaller boats let out longlines that trail behind them carrying thousands of hooks.

There are fewer fish in the ocean today than in the past. This world-wide problem is caused partly by modern fishing methods: too many fish can be caught too easily at one time. It also partly comes from too many countries sending their ships to fish in the same areas. As well, the problem might partly be caused by changes in the ocean: the direction of currents and the temperature of the water. Scientists are investigating these matters.

Because of smaller stocks, limits have had to be placed on the number of fish that can be caught. It is getting harder to make a living from fishing.

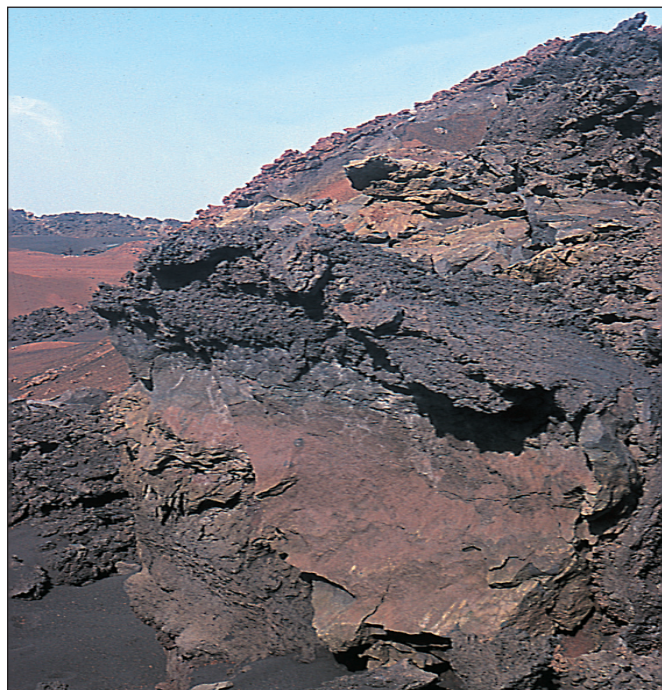


Here, scientists have been able to watch the birth and development of an island. They think that Iceland itself developed in this way long ago from a series of volcanic mountains joined together.

Scientists discovered the first plant growing on Surtsey just two years after the island's birth. They think it resulted from an airborne seed. Gulls and other birds stop on the island and deposit their droppings. The droppings might be carrying seeds; droppings also fertilize plants. Surtsey is now one of the most important birthing sites for Grey Seals on the southern part of the Icelandic coastline.

We leave Surtsey feeling as though we have been present at the beginning of the world. We are soon back to reality when we spend a smelly and uncomfortable night in hammocks and bunks on the boat. Early in the morning we enter the harbour at Reykjavik.

The capital city looks striking as we enter its harbour. I notice right away that there are birch trees near the city. There were almost no trees in the countryside. We learn that there are hardly any trees on the island. In fact, only one-quarter of Iceland is covered with continuous vegetation of any kind.



Lava from volcanoes hardens into rock like in this photograph. The island of Surtsey is lava rock that is emerging from the sea.

As we glide to the dock, many rows of neat houses stand out clearly. They are painted in lovely pastel colours. There are some high-rise buildings, too. Mr. Kristinsson tells us that long ago houses in Iceland were made of turf and stone. Most modern buildings are made of concrete. They are built sturdy to withstand the strong winds that often blow and to stand up against occasional earthquakes as well.

On the dock we meet the other half of our group, which had gone to the western part of the island. Fjóra is there, smiling and joking as usual. I like her a lot. I think she likes me—but maybe she just likes everybody. She welcomes us warmly to her hometown.

Our week in Reykjavik flies by quickly. We visit an art gallery, go to the theatre, and attend a symphony orchestra concert. I have never attended a symphony before. I love it. We learn that the arts—music, poetry, drama, painting—are very important to Icelanders.

We also tour the city and see the many ways that Icelanders use the free heat that comes from the island's **hot springs**. I am interested in the subject of energy use by humans, so I find the tour very enjoyable.

The weather turns stormy during our last two days here. Heavy rain turns to sleet and then to snow. It is blown into our faces by a strong wind. Fjóra says that the amount of rain and snow varies quite a bit from place to place on the island. But precipitation is heavier everywhere during the winter. It sure looks like winter is setting in now.

It is less windy the day we catch our plane, and it has stopped snowing. We say our sad goodbyes once again. Soon we are above the clouds and heading across the cold Norwegian Sea to Norway.

SEARCH

Take the perspective of a fish and write a letter to a fisher describing the current situation of over-fishing in the world.

ICELAND'S GEOTHERMAL ENERGY

Geothermal energy is energy that comes from underground pools of water that are naturally heated by the pressures of the earth's crust. Water from these pools often rises to the earth's surface in thermal springs. There are about 800 thermal springs throughout Iceland. The average outflow of water from these springs is about 1200 litres every second. The average natural temperature of the water is 80°C.

In many places this water is captured and piped to where it is useful. It is used in swimming pools and hot tubs. It is used for hot water taps in homes and to heat buildings. It is much cheaper to heat buildings this way than to install a furnace and burn coal or fuel oil. It is much cleaner for the environment too.

Water from thermal springs is also used to heat large greenhouses. Many exotic fruits, vegetables, and flowers are grown in them.



This tower holds hot water from thermal springs. From this tower, the water can be piped to buildings. The average natural temperature of the water is 80°C.

SEARCH

Research a hydroelectric power project in the circumpolar world. Considering the economic/environmental advantages/disadvantages, should hydroelectric power continue to be a primary method of generating electricity? What are the alternatives?

WEB LINKS

eLibrary

Address: <http://elibrary.bigchalk.com/libweb/canada/do/login>
NWT access - Username: govont0201 Password: elca

CultureGrams

Address: <http://online.culturegrams.com/>
NWT access - Username: govnorthwest Password: welcome

Iceland Tourist Board for North America

<http://www.goiceland.org>

Ministry of Foreign Affairs; Government of Iceland

<http://www.iceland.is>

National Geographic

http://travel.nationalgeographic.com/places/countries/country_iceland.html

The Surtsey Research Society

http://www.surtsey.is/index_eng.htm

Norway

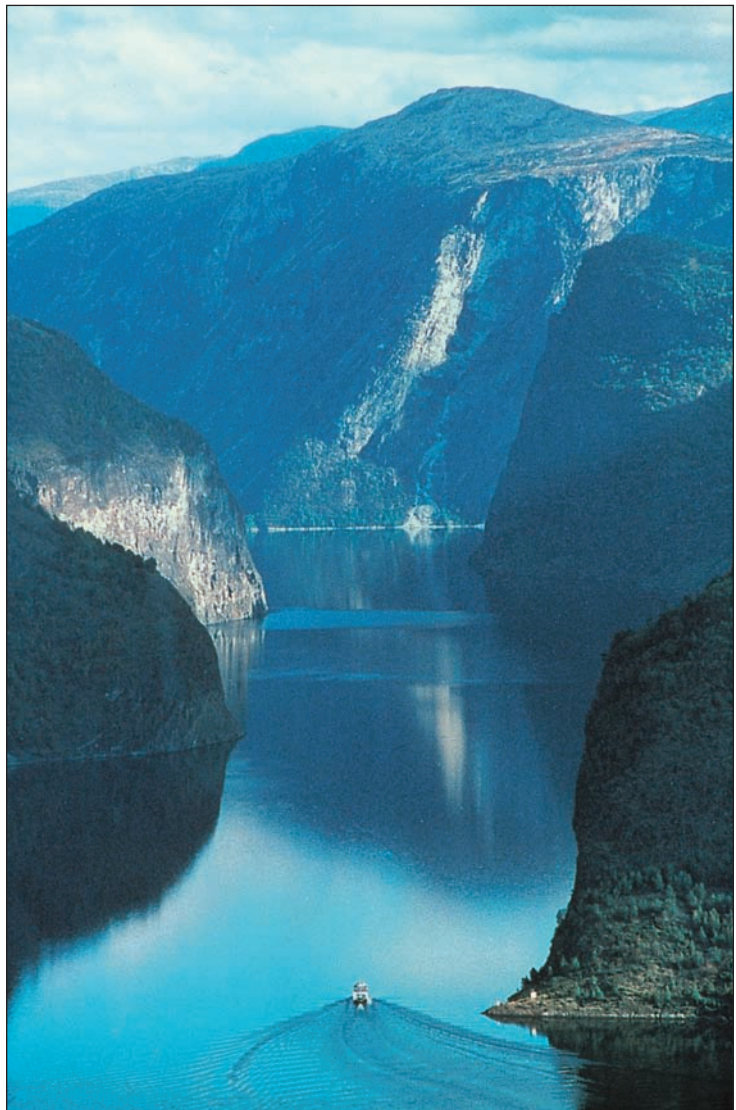
CHAPTER 5

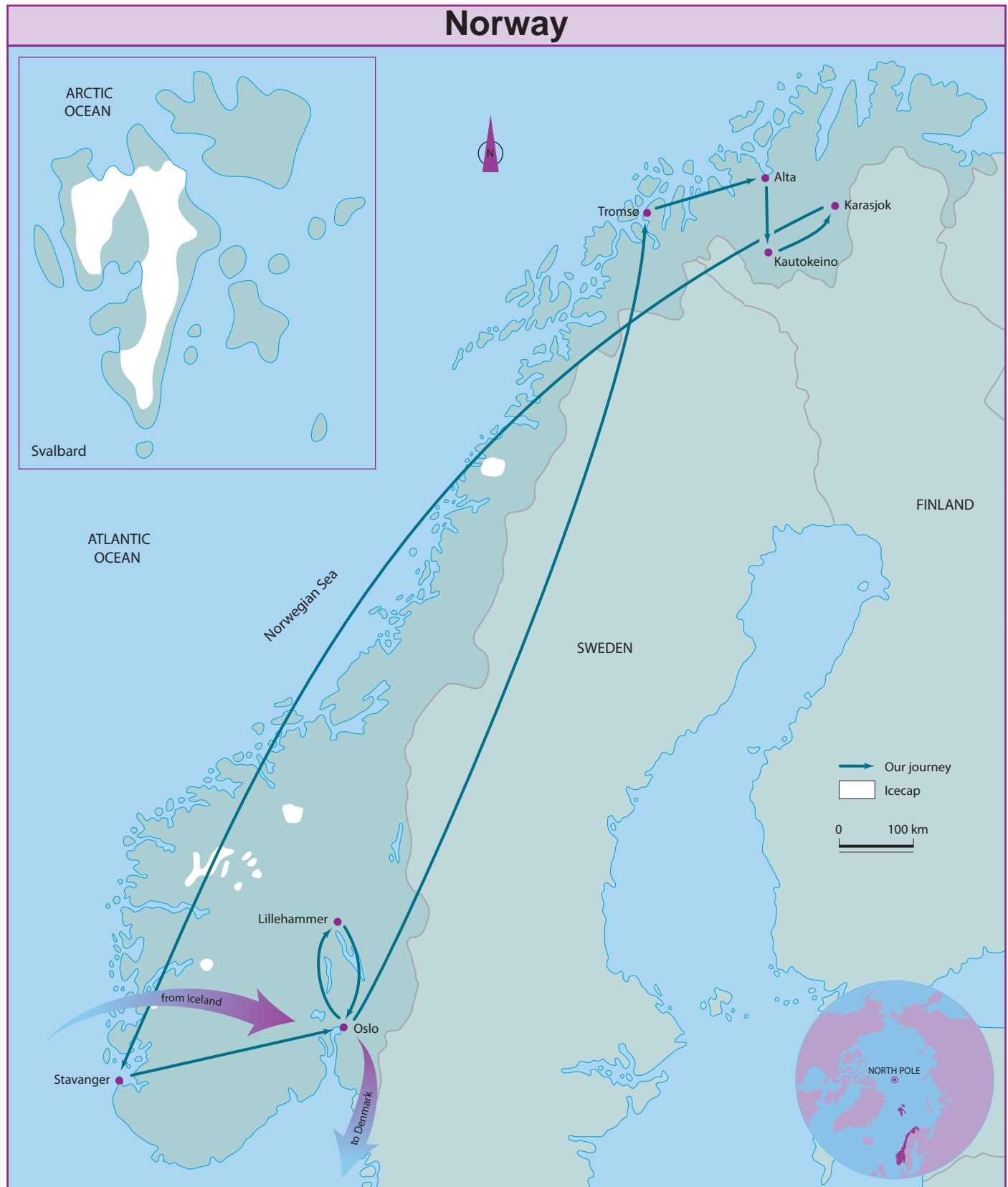
Flying over the North Sea, we can see an offshore oil drilling platform below. A supply boat is steaming toward it through the stormy ocean. We plan to visit one of these platforms. I wonder if this is the one. Suddenly, the captain speaks over the intercom. "Norway is just ahead of us," he says. Soon I can see the jagged Norwegian coast.

The famous Norwegian fiords are easy to pick out. The ocean carves deeply into the land again and again. The steep walls of the fiords are rocky cliffs rising out of the water. The cliffs seem to leap up to the heights of a coastal mountain range. Soon we are over the snow-covered mountains and heading down into a pretty valley where we land at Oslo.

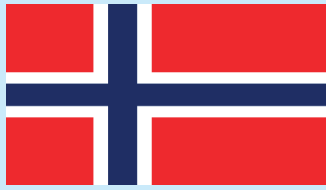
When we get off the plane, a lively, smiling woman named Ingrid Haugen greets us. Ms Haugen will be our hostess. She gives us information packages and little gifts from the Government of Norway.

A fiord is a long, narrow arm of the sea bordered by steep cliffs. The fiords in Norway are extensions of Norwegian valleys that have dropped below sea level. This is the Aurland Fiord.





We will arrive in Oslo and will travel as far north as Alta.



N
O
R
W
A
Y



BASIC FACTS

Formal name: Kingdom of Norway

Common name: Norway

Area: 386 958 km² (including Svalbard and Jan Mayen)

Area north of 60° latitude: 82% of total (est.)

Population: 4 752 735 (2008)

Life expectancy: males, 78; females, 83 (2007)

Ethnic mix: predominantly ethnic Norwegians who are of North Germanic / Nordic descent, although there are communities of the Scandinavian native people Sami who settled the area around 8,000 years ago as the predominant minority

Capital city: Oslo

Population of capital: 560 484 (2007)

Other major population centres: Bergen, Stavanger/Sandnes, Trondheim, Fredrikstad/Sarpsborg, Drammen, Skien/Porsgrunn, Kristiansand, Tromsø

Government: a constitutional monarchy; a representative democracy with a parliamentary system; led by a prime minister and cabinet; the legislature is comprised of one elected house, the Storting

Currency: Norwegian krone

Natural resources: Natural resources: petroleum (third largest oil exporter after Russia & Saudi Arabia - petroleum industry accounts for a quarter of the gross domestic income), copper, natural gas, pyrites, nickel, iron ore, zinc, lead, fish, timber, hydropower.

Land use: arable land: 3.3%; forests and woodland: 37%, of which 23% is productive forest; other: 60% (mountains and heaths 47%, bogs and wetlands 6.3%, lakes and rivers 5.3%, urban areas 1.1%)

Exports: \$122.6 billion (2006 est.)

Export goods: petroleum and petroleum products, machinery and equipment, metals, chemicals, ships, fish

Main export partners: UK 25.5%, Germany 12.6%, Netherlands 9.9%, France 9.1%, US 6.7%, Sweden 6.5% (2005)

Imports: \$59.9 billion (2006 est.)

Import goods: machinery and equipment, chemicals, metals, foodstuffs

Main import partners: Sweden 14.6%, Germany 13.6%, Denmark 7.3%, UK 6.8%, the People's Republic of China 5.5%, US 5%, France 4%(2005)

THUMBNAIL HISTORY

During the last ice age, 11 000 years ago, only some southern coastal areas of Norway were occupied. As the ice began to recede, Germanic tribes began moving in. The land was inhabited by descendants of the present Norwegian people beginning in 2000 BCE. They settled in the southern part of the country around the same time that the Sami were settling in the north.

The strength of these people was felt by others during the Viking era, from 800 to 1100 CE. It was an age of conquest and expansion. During that period the country was united under a king.

After the Vikings accepted Christianity, their relations with other European peoples became more peaceful. The country became more involved in European trade and commerce.

In 1380 CE, Norway became subject to Denmark. Still it prospered. By the 1600s it regularly exported lumber and fish. Its shipping industry was beginning to develop.

During the Napoleonic wars in the early nineteenth century, Denmark sided with Napoleon, while Sweden sided with Britain against Napoleon. Napoleon lost, so Norway was taken from Denmark and given to Sweden. (Denmark kept the colonies of Greenland, Iceland, and the Faeroe Islands.)

Norway won its independence from Sweden in 1905. The Norwegian parliament, the Storting, was established. Their parliamentary rules are designed to promote cooperation, not confrontation. Members representing the same county are seated together, not with their political party. Also, members are forbidden to heckle, shout, or applaud.

Until the early part of the twentieth century many Norwegians were very poor. During the years of poverty, more than half the population of Norway emigrated to North America. (Ireland was the only other European country that equalled this extraordinary level of emigration.) The discovery of



This is the royal family of Norway: King Harald, Queen Sonja, Princess Märtha Louise, and Crown Prince Haakon Magnus.

oil in the North Sea has created an enormous source of income which has been almost entirely directed to an trust fund to secure the economic future of the country (worth \$350 billion by January, 2008).

She tells us that we will be allowed to get a good night's sleep before travelling on in the morning. First we will go north, beyond the Arctic Circle, into the heart of Samiland. Then we will visit Stavanger on the southwest coast. It is a busy port city and the centre for offshore oil activity. Finally we will return to Oslo to enjoy everything the capital city has to offer.

The next day, our flight north of the Arctic Circle seems to take forever. The short day contributes to that feeling. Even though we sleep late, the sun is just rising in Oslo as we take off. We fly to Tromsø, then change to a smaller plane. We fly to a small airport on the bleak northern coast. It is already dark again when we land, but thankfully the darkness is lessened by a thick blanket of snow. The ground is frozen. The air is cold.

After staying the night in Alta, we travel by bus across the treeless tundra to Kautokeino. Ms Haugen tells us Kautokeino is sometimes called the cultural centre of the Sami.

Many Sami have adopted a lifestyle that is much like that of other Norwegians. Some Sami still wear parts of the national dress every day, but most save their full national dress for special occasions. Perhaps only 10 per cent of the Sami descendants still practise the traditional herding of reindeer. Now herding is being mechanized and organized to increase meat production. These changes mean that fewer people are needed as herders. Many former herders now work in other traditional Sami occupations, fishing or agriculture. Others work in trade, small-scale manufacturing, handicrafts, or in the service industry as teachers, actors, and power-plant workers, for example.

Ms Haugen says that a number of factors have made it hard for the Sami culture to survive, yet it is still quite strong. In fact, it looks like the erosion of the Sami culture has recently been stopped and even reversed. Rhythmic poems are still performed in the traditional way, and they are performed in modernized versions as well.

There is Sami radio, television, and literature. There are Sami language newspapers, magazines, and comic books. Sami artists create designs using religious symbols from traditional shamanistic drums.



Some Sami wear parts of their national dress everyday. Most of the Sami population lives in Finnmark, the northernmost county in Norway.

We get our own rich taste of Sami culture when we see a play produced by a Sami theatre group in Kautokeino. The group has been featured on Norwegian television and they are very good. We can't understand what they are saying, yet their comedy comes through anyway. Interpreters quietly explain the more serious parts of the play to us.

The next day we travel to Karasjok. We are lucky because we arrive there on the opening day of the Sami **Assembly**. All the representatives wear their brightly coloured national dress for this special occasion.

We watch the Assembly at work for a while and then go to meet our billets. Jimmy Nevak and I are together this time. We are billeted with the Haetta family. Jimmy has been very quiet on the trip so far, but I now see him in a new light. He likes to play harmless practical jokes on people. He makes the Haettas and I laugh with his gentle sense of humour.

Everyone in our group enjoys the next few days living with Sami families. We learn some phrases in their language, which they say is related to the Finnish and Hungarian languages. We play Sami games and sing their songs too. They take us skiing. Cross-country skiing is the favourite sport in Norway. Best of all, we camp out for a night in skin tents. Our billets create a traditional campsite especially for us. To get there, reindeer pull us on sleds across the tundra! As we trot along, we frighten a flock of ptarmigan into the air. They soon settle down again, though, just as they do at home. (See Chapter 15 for a picture of a ptarmigan.)

It's hard to imagine that we will find anything more interesting or enjoyable in our journey than these experiences with the Sami.

We're sad when we leave Samiland the next day.

Going south to Stavanger, we find that the days are a little longer again. There are still six or seven hours of daylight in the third week of November. A heavy wet snow is falling, but it soon melts.

Stavanger's harbour is free of ice. Ms Haugen tells us that most ports on the west coast of Norway stay free of ice all year round, just as they do in Iceland. The reason is the same. The warm Gulf Stream washes the western coastline. This current moderates the coastal climate.

THE SAMI

The Sami are Aboriginal people (sometimes called Laplanders by others), who live in northern Scandinavia. There are about 40 000 Sami in Norway, 17 000 in Sweden, 6000 in Finland, and 2000 in Russia.

Traditionally the Sami lived by hunting and fishing. In the last few centuries, while some Sami continued to fish or farm, many others started herding reindeer. This activity became the focus of their lives. They lived in sod huts or skin tents. When necessary, they moved with the reindeer to new pastures. The reindeer provided food, clothing, and shelter. They also pulled and carried loads.

The traditional Sami culture included chanting rhythmic poetic songs called *yoik*, and re-telling legends. The original Sami religion was animism, a religion in which shamans and drumming played an important role. The Sami practised folk medicine, using traditional knowledge and the materials of the land. They created carvings and made a variety of handicraft items. The Sami national dress is colourful. Navy blue and red are most visible, with dashes of yellow and green.

Sami **society** has had close contact with Norwegian society for more than 1000 years, so the cultural borderline between the two gradually became blurred. The Sami way of life was affected by a growing inflow of people from southern areas. Recently, tourist developments, dams, and mines have brought new people and lifestyles. Herding areas have shrunk, and herding is more difficult. Television programs attract Sami children to other languages and other lifestyles.



In the past, the Sami lived by hunting and fishing. Reindeer were a staple in their diet, and were a source of clothing, shelter, and transportation. In North America, reindeer are called caribou.

THE SAMI ASSEMBLY

Responding to Sami requests, the Government of Norway created the Sami Assembly, called the *Sameting*, in 1989. The Sameting has 39 members who are elected by the Sami every fourth year, on the same day that elections are held for the Norwegian National Assembly. The Sameting cannot make laws. It offers advice to the Norwegian government and pressures the government to follow it.

The main job of the Sameting is to protect and develop the Sami language, culture, economy, and way of life. One measure of its success is that Sami children in Norway are entitled by law to learn their school subjects in their own language.

Even though the Sami are taking steps to govern themselves, the Government of Norway regards the Sami as Norwegian citizens with the same rights and duties as all other Norwegians.

Snow does not stay long here. This is different from the interior of Norway. There the snow stays throughout the winter.

For more than 1000 years, Norway has been a seafaring nation. Fishing the sea has long been an important industry, and Stavanger has always been an important fishing port. It has been called the sardine capital of Norway. Now however, Stavanger is also the main land base for offshore oil drilling activities.

We must wait for the weather to improve before visiting the offshore drilling platform. So we visit places of interest in Stavanger for two days. When the break comes, we put on survival suits and fly by helicopter across the water. It is completely calm after 10 days of storms.

The drilling platform is quite near the shore. As we approach it we begin to appreciate its size. It is huge, like a small town. Standing on its giant concrete base in the water, it looks like a space station from the future. There are eight or nine floors of building on top of the platform. There are many

rows of windows to let light into offices, control rooms, powerhouses, machine shops, kitchens, lounges, recreation areas, and bunkhouses. There are four large cranes for lifting equipment and supplies. And there is a huge derrick that stands higher than everything.

When the helicopter lands, we get out onto the flight deck. We are high above the ocean. There is a loud noise from a flare that is burning off natural gas and a constant rumble from generators producing electricity. It is nerve-wracking! We walk very carefully down the steel stairs to the main deck, holding the handrail firmly.

We are taken to a classroom where a company employee speaks to us. She tells us that in the past Norway supplied its energy needs with coal from its far-northern island possession of Svalbard and with electricity generated at dams on some of its many short, swift-flowing rivers. However, oil and natural gas were discovered beneath Norwegian waters in the late 1960s. Offshore oil and gas now supply much of Norway's



An offshore oil drilling platform is as large as a small town. It drills for oil under the sea.

energy needs, and are important to Norway's economy. Their export provides income to help develop other industries. In 1994 Norway became the third largest exporter of oil in the entire world.

Norwegian companies designed and built this huge platform. It was built in the Stavanger harbour. Tugboats towed it here. Some of its tanks were deliberately flooded and settled onto the ocean floor. Its decks are high above the sea surface. It is very stable. It can withstand ice, waves 27 metres high, and winds as strong as 200 kilometres per hour.

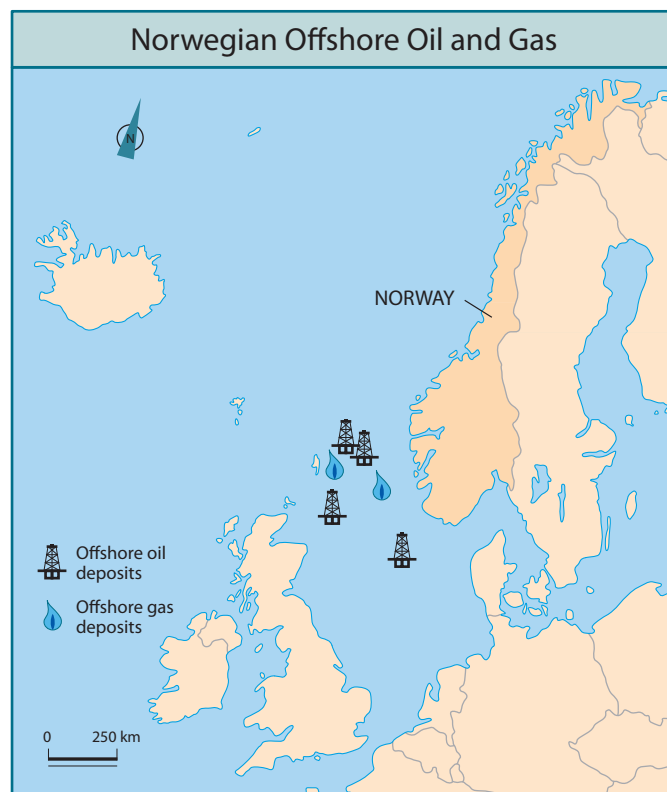
The platform is a temporary home to hundreds of workers from many countries. They come to work 12 hour shifts every day for two weeks. Then a second crew comes in and the first crew goes home for two weeks. Work on the platform never ends. It goes on 24 hours a day every day of the week.

Each platform can drill many holes while searching for oil. When oil is found, it naturally flows to the platform. There it is pooled with oil from other wells and pumped through an underwater pipeline to storage tanks on shore.

"Is drilling like this safe?" Jimmy asks. "What if a pipeline breaks, or a wild well gushes oil?" Ms Haugen agrees that some people, especially those in the fishing industry, worry about offshore oil drilling. "An oil spill would **pollute** the sea and could destroy the fishing industry," she says. "But so far, there have been no major problems."

After the classroom presentation, we tour the main parts of the platform. Seeing all the equipment and machinery operating on board, it is hard for me to believe that humans could design and build such an amazing place and get it to work safely in the sea.

Finally we have lunch in the dining room. There is every kind of food imaginable, including many sweet desserts! We are told that the workers are always fed well because it is important to keep their spirits high during their long, hard shifts. There is a selection of juices and soft drinks for us to choose from, and the rich aroma of strong coffee tempts us. Norwegians and other Scandinavian crew members enjoy drinking many cups of strong coffee every day.



Oil and natural gas were discovered in Norway's waters in the late 1960s. Offshore oil and gas now supply much of Norway's energy needs.

After lunch we put on our survival suits again, climb into the helicopter and fly back to Stavanger. During the next few days, we learn more about the oil industry. We also learn about the growing construction industry, the fishing industry, and Norway's merchant marine fleet. In keeping with Norway's seafaring tradition, its merchant fleet is one of the world's largest. It is an important source of income for the nation. It offers shipping services to countries all around the world. Jens tells me that he hopes to become the captain of a merchant ship one day. With his clear thinking and calm personality, I am sure he will make a good captain.

We return at last to Oslo, using the electrified rail system. It is clean, fast, and very comfortable. It gives us a good view of the countryside as we speed toward the capital.

Oslo may not be a large city by world standards, but it is the biggest I have ever visited. It seems busy and exciting. I enjoy our visits to shops, schools, and factories. I enjoy the theatre

and musical productions we see. I enjoy the evenings we spend with our host families. But in the end, our visit to the Viking Ship Museum is the best.

Near the Viking museum we see *Gjoa*, the ship that Roald Amundsen sailed on the first successful voyage through the **Northwest Passage**. We also see *Fram*, Fridtjof Nansen's famous ship of arctic exploration. Inside the museum we see the sleek, wooden hull of a Viking ship that was dug up in 1905. It was built in the ninth century CE. It is more than 21 metres long and has ports for 15 oars along each side.

The museum guide says that these Viking vessels had a mast and sails as well as oars. Vikings sailed in them on far-ranging expeditions, even out onto the open seas where they navigated skillfully using the sun, moon, and stars as guides. They plundered on these expeditions, and traded and established colonies, too.

Ms Haugen says that the Viking "free spirit" generally led to government in Norse colonies that showed a high regard for individual freedoms. These

colonies, and their Scandinavian mother countries, have long shown a preference for democracy over autocratic government. She adds, "Norwegians look back on the Viking era as an important time in their



Norway's merchant fleet is made up of oil tankers as well as specialist ships that carry cargoes such as gas, chemicals, coal, and cars.



Oslo is the capital city of Norway. It has a population of 560 000 (2007).

THE VIKINGS

During the Viking era (about 800 CE to 1100 CE), young Scandinavian men went to sea in vessels given names like *Great Dragon*. They sought adventures in commerce and war. They believed it was honourable to die in battle. They believed that those who died in battle would forever have places of glory in Valhalla, Odin's Hall of the Slain. So they prayed to Odin, their chief god and god of war, and to Thor, the thunder god, before setting out on remarkable journeys. Travel, trade, war, and plunder are all wrapped up in the meaning of the word "Viking."

Vikings first came to the world's attention in 793 CE, when they attacked a monastery on the island of Lindisfarne in northeast Britain. This set the pattern for many of their future attacks on coastal and river towns in Europe. Arriving unexpectedly, they attacked quickly and brutally, using superior steel swords. They often attacked churches, knowing they would find precious objects of gold and silver to steal. They also captured young women and sold many as slaves.

Vikings traded, especially along the great rivers of eastern Europe. They exchanged slaves, furs, wax, honey, and amber for fine

things from the east, such as silks and spices. Their fair-skinned slaves from western Europe brought a high price in this trade.

Vikings were explorers and settlers. Good land was becoming scarce in northern Europe. The growing population wanted new lands to settle. So Viking ships made ever-bolder journeys out onto the high seas. They took control of the east coast of Britain. Jorvik (York), England, became a Viking capital. They settled on the Orkney Islands, the Shetland Islands, and the Hebrides. They conquered Ireland and founded the colony of Dufflin (later Dublin).

Then they went further afield to the Faeroe Islands. Eventually they set up colonies on Iceland. Those people later colonized Greenland and attempted to settle in Canada. Whenever they went on these journeys of settlement, Vikings took ponies, goats, seeds, and tools—everything necessary to establish self-sufficient colonies.

The Viking era ended when Christianity arrived in Scandinavia.



The Vikings built swift, seaworthy longships that allowed them to attack coastal towns in Europe. Norwegian and Danish Vikings sailed west, overrunning most of Ireland and England. Swedish Vikings sailed east.

history. It was when the people became united and the country gained its identity.”

We end our Norwegian visit with a day of skiing. We are taken to Lillehammer, the site of the 1994 Olympics. Conditions are perfect—fresh snow, light overcast, and temperatures just below zero. It is wonderful! Again and again we glide happily down the easier slopes. We even recognize places we saw on Olympic television coverage!

We return to Oslo to board the ferry for Denmark. My head is still filled with exciting thoughts of Viking adventures as we wave goodbye to the wonderful people we've met in Norway.

COMPARE

Compare the range of temperature and light in the north to the range found in a region close to the equator. What are the benefits/disadvantages of having seasons?



This ancient rock engraving, called a petroglyph, shows that Norwegians were skiing as early as 4000 years ago. Other petroglyphs, found in southeastern Norway, give evidence that the first Norwegians settled in the area about 10 000 years ago.



Winter sports are popular in Norway. The 1994 Winter Olympics were held in Lillehammer.

WEB LINKS

eLibrary

Address: <http://elibrary.bigchalk.com/libweb/canada/do/login>

NWT access - Username: govont0201 - Password: elca

CultureGrams

Address: <http://online.culturegrams.com/>

NWT access - Username: govnorthwest - Password: welcome

The Official Travel Guide to Norway

<http://www.visitnorway.com>

We Are The Sami

<http://www.galdu.org/web/index.php?sladja=43&giella1=eng>

Wikipedia – About the Vikings

<http://en.wikipedia.org/wiki/Viking>

Gateway to the Public Sector in Norway

<http://www.norway.no>

Aftenposten: News From Norway

<http://www.aftenposten.no/english/>

SEARCH

Compare the light and weather conditions in Stavanger, Norway with those in your community in mid-November. Discuss - How do you adjust to the difference in light and weather conditions in the summer and in the winter? Brainstorm as a class in what ways do you prepare for a new season?

THINK

How do you think human rights have changed in the past 100 years for children, women, and peoples of the First Nations? Would you prefer to live in present day, or 100 years ago? Explain your answer.

Denmark

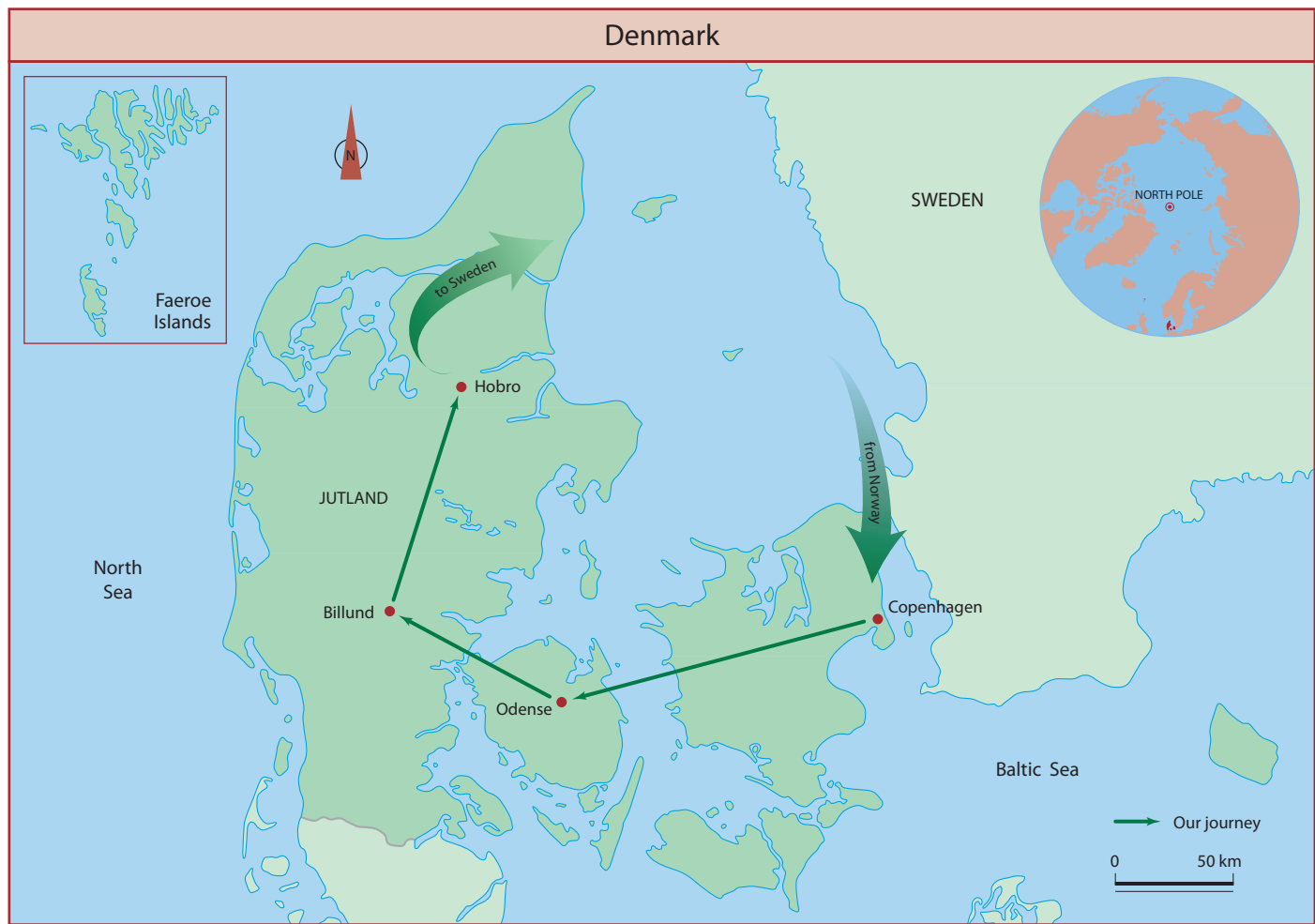
CHAPTER 6

We are surprised when we board the ferry. It is huge compared to the ferry we used to cross the Mackenzie River. That one could carry a large truck, a few cars, and about 20 passengers. This

one is an ocean-going vessel. It carries hundreds of cars and trucks on its lower decks and nearly 1000 passengers. It looks safe, but as I board I recall a news story I read about the ferry that



This is the harbour at Copenhagen. The large ship to the left of the photograph is a ferry. The back doors are open so that cars and trucks can drive in.



Denmark is not truly a circumpolar country, since its northernmost point is only 58°N. We are travelling here because of Denmark's connection to Greenland and the Faeroe Islands.

sank in a storm on the Baltic Sea a few years ago. Hundreds of people died. I'm a bit nervous as we cast off, but the weather seems fine. We should be all right.

Johannes is surprised that there is open water and that ferries are still running on December 2. Ms Bohnet says that the sea around Denmark freezes over only one winter out of about twenty. The Danes call that one "an ice winter."

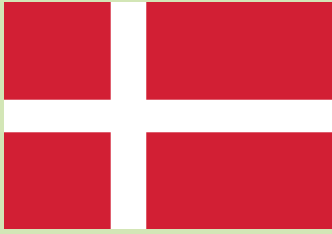
Ms Bohnet reminds us that Denmark is not actually a circumpolar country. Its northernmost point is only about 58°N. However, it is included

in the circumpolar countries because Greenland and the Faeroe Islands are part of the Danish realm. Moreover Denmark has played a big role in exploring and settling the circumpolar world. This is why we have come. She says we will visit the Danish Polarcenter, which is the focal point for Danish-Greenlandic arctic research, and the Copenhagen office of the Greenland Home Rule Government.

Because it is not truly a circumpolar country, Ms Bohnet reminds us that we will not stay in Denmark as long as we have stayed in the other countries. And we will not have to take the usual notes about climate, landforms, plants, animals, and lifestyles. In other words, our 10 day visit is a holiday! We all cheer. She brings us back to reality by reminding us that we should use some of our time to organize and develop our notes on the other countries. "The day of reckoning will

PHOTO

Photo (pg58) – In what ways does this photograph show how Copenhagen is different or the same as your community. What can account for these differences or similarities? Predict what changes may take place in your region over the next 100 years.



D
E
N
M
A
R
K



BASIC FACTS

Formal name: Kingdom of Denmark

Common name: Denmark

Area: Denmark 43 075 km² (excluding Greenland & the Faeroe Islands which are autonomous provinces of Denmark with home rule)

Area north of 60° latitude: 0% (excluding Greenland and the Faeroe Islands)

Population: Denmark 5,475,791 (2008)

Life expectancy: Denmark – Males: 76 Females 80 (2007);

Ethnic mix: The majority of Danes today trace their heritage to Germanic tribes who have inhabited Denmark since prehistoric time.

Capital city: Copenhagen;

Population of capital: Copenhagen - 1,835,467 (2008)

Other major population centres: Århus, Odense, Aalborg, Esbjerg

Government: a constitutional monarchy; a representative democracy with a parliamentary system; led by a prime minister and cabinet; the legislature is comprised of one elected house, the Folketing. As Greenland & Faeroe Islands are autonomous provinces of Denmark, they practice home rule (also known as self-government or devolution).

Currency: Danish krone (DKr)

Natural resources: Natural resources: petroleum, natural gas, fish, salt, limestone, stone, gravel and sand. Industry: Denmark is self-sufficient in energy - producing oil, natural gas, wind- and bio-energy.

Land use: Arable land: 60%; Permanent crops: 0%; Permanent pastures: 5%; Forests and woodland: 10%; Other: 25% (1993 est.)

Exports: \$93.93 billion (2006 est.)- machinery and instruments, meat and meat products, dairy products, fish, pharmaceuticals, fashion apparel, furniture, windmills; main destinations - Germany 16.8%, Sweden 14.2%, UK 9.0%, U.S. 6.7%, Norway 5.7% France 5.5%, Netherlands 5.3%, EU 69.6% (2006)

Imports: \$89.32 billion (2006 est.) - machinery and equipment, raw materials and semimanufactures for industry, chemicals, grain and foodstuffs, consumer goods Main sources- Germany 21.5%, Sweden 14.3%, Netherlands 6.5%, UK 5.8%, China 5.2%, Norway 4.6% France 4.2%, Italy 4.1%, EU 72.6% (2006)

THUMBNAIL HISTORY

The last ice age began to disappear around 11 000 BCE. As melting progressed, nomadic groups moved into the region of Denmark following reindeer herds. The earliest known site of human habitation, dating from about 9000 BCE, has been identified on the island of Zealand. Around 3000 BCE the last of the ice melted in the region and permanent settlements were established. Agriculture began. There is evidence that by 500 BCE people here were using iron weapons and tools. The first mention of Danes in historical sources appears around 400 CE.

For thousands of years, the early Danish people worshipped the old Norse gods. Most important among these gods were Odin, the chief god, Freya, the goddess of love and beauty, and Thor, the god of thunder and strength. In 960 CE King Harald I, “Bluetooth,” was baptized. He then made Christianity the official religion of the country.

Harald’s grandson, King Canute the Great, attempted to increase Danish power. He took control of a large part of Britain and imposed Danish law there. He also strengthened Denmark’s control over Norway, but his realm fell apart after his death.



Ribe is one of the oldest towns in Denmark.

King Valdemar I, and the warrior-bishop Absalon who founded Copenhagen in 1169 CE, extended Danish power once again in the twelfth century. This was extended even further when Queen Margrethe took power in the name of her son in 1375. She got control of Norway and Sweden too. Norway remained a Danish possession for centuries, but Sweden broke away in the sixteenth century and became a strong nation in its own right.

The Catholic Church lost its power in Denmark when King Christian III took over church lands in 1536 and established the Lutheran Church as the state religion. The Evangelical Lutheran Church is the established church to this day. Danish monarchs are required by law to belong to it. Other Danes, however, enjoy freedom of religion.

Following the Napoleonic Wars in the early part of the nineteenth century, Denmark was forced to give Norway to Sweden. However, it kept control of the former Norwegian colonies of Iceland, Greenland, and the Faeroe Islands. Iceland became an independent country in 1944. The other two regions are still a part of the Danish realm, but they enjoy Home Rule Government.

come,” she assures us. “You will have to produce reports.”

From the moment we enter the harbour and see the famous statue of the Little Mermaid, Copenhagen seems like a fairy tale city to me. The cobbled streets and the old, well-kept buildings seem magical and charming.



The statue of the Little Mermaid is found in the harbour at Copenhagen.

At the dock, Hanne Larsen welcomes us to Denmark. She smiles warmly and gives us envelopes containing buttons, pins, and information. Then she introduces us to our host families and sends us on our way with them.

For the next few days we tramp around the streets of Copenhagen sight-seeing. We start by climbing the curving stairs on the outside of the spire of The Church of Our Saviour. From the top we get a breath-taking view of the city. Then we go to Strøget. It is a walking street that is closed to traffic. There are many wonderful shops along it. Denmark is well known for its silverware, glassware, distinctive furniture, toys, and hand-painted porcelain.

There are lots of shops selling these things. I am surprised to see there is even a McDonald's restaurant!



We wander the streets of Copenhagen.

One evening, at Niels' insistence, we pass by the famous Tivoli Gardens, a public garden and amusement park first opened in 1843. It is closed for the winter, but the lights outlining its many buildings have been turned on to brighten the coming Christmas season. I have never seen so many lights. It is a wonderful sight that fills me with excitement.

In the evening we go to the Royal Danish Ballet. At first I am not thrilled. I have never seen a ballet before, and the ads don't look very interesting. I don't think I'll like it. But I soon change my mind. The troupe dances *The Nutcracker*. It is a musical production written by Peter Tchaikovsky, a Russian composer. It is a wonderful story of a young child's dreams. The costumes are colourful. The music, played by a live orchestra, is rich and soul-stirring. The dancers are strong and graceful. When I go to bed that night, my head is filled with happy visions of toy soldiers and sugarplum fairies. Suddenly I feel homesick. I miss my family. I won't be home for Christmas.

The following day we go to Christiansborg Palace. It is a grand building where the Danish legislature meets in a large, impressive chamber.

The Danes call their legislature the *Folketing*, which means "the People's Assembly."

An official gives us a palace tour, gives us information about the Danish government, and tells us about the Nordic Council. The Council is a very interesting idea. Under its terms, the five Nordic countries, Denmark, Finland, Iceland, Norway, and Sweden, cooperate with one another, almost as if they were provinces in one country.

There is another grand complex of buildings close to the legislature. This is Amalienborg Palace, the home of Denmark's royal family. We sort of get to see this beautiful palace as well. I say "sort of" because it is pouring rain. We aren't dressed well enough to wait around and take pictures. We pause for a few moments hoping to see the monarch, Queen Margrethe II. We aren't lucky, though.

At the end of each busy day, Mary and I return, full of new information, shaped by new experiences, tired and happy, to the home of Henning and Benedikte Jakobsen and their children. On our last evening in Copenhagen, though, Mary does not return with me. She stays



The Danish royal family lives at the Amalienborg Palace.

The Government of Denmark

The legislature has 179 seats, one for each of 179 representatives who are elected from different parts of the realm. They meet in Copenhagen and pass laws for the whole country. Two of these representatives are elected from Greenland and two from the Faeroe Islands.

The Government of Denmark is led by a prime minister and cabinet. The prime minister chooses a cabinet from among members of the legislature. These cabinet ministers run the various departments of government, such as defence, foreign affairs, and economic development. The prime minister gets the top job after gathering the support of a coalition of political parties represented in the legislature. The prime minister is often the leader of the party that has won the most seats in the last election.

Denmark's government is a constitutional monarchy. The monarch (king or queen) is the official head of government. The monarchy is highly respected, but does not exercise day-to-day political power. This power is exercised by the elected prime minister and cabinet. The monarch's role is largely ceremonial, but she or he fulfills important duties: signing enactments of the legislature before they become law, leading negotiations when new coalition governments are being formed, and keeping regular contact with the people.

with Niels Aalborg's family. He wants his parents to meet her. Ms Bohnet is unhappy about this arrangement, but she gives in when Niels' parents assure her that all will be well. It is too bad that Mary misses a very happy musical evening with the Jakobsens and their relatives. We end the evening with colourful, sweet drinks and tasty pastries. I laugh when I discover that what we call "Danish pastries," the Danish call "Viennese bread."

After six days in Copenhagen, we go to Odense. The city is named for the old Norse god, Odin. It means "Odin's Holy Place." It is thought to be a special place where people long ago went to worship Odin. As we pass through the low-lying countryside on our way, we see several small, well-kept farms. Denmark's farms, Ms Larsen tells us, are world famous for butter, cheese, ham, and bacon.

For us, the main attraction in Odense is Hans Christian Andersen's cottage. He was born there in 1805 and lived there when he was a little boy. It makes the skin tingle on the back of my neck to see things that actually belonged to him. We see his bed, desk, and trunk. Best of all, there are some papers with his handwriting on them. Ms Larsen calls them manuscripts. They are the original fairy tales as he wrote them, before they were sent to a printer.

Everyone in our group knows at least some of Andersen's tales. There are so many! *The Little Mermaid*, *The Princess and the Pea*, *The Red Shoes*, *The Snow Queen*, *The Steadfast Tin Soldier*, and many more. Leaving the cottage, we noisily tell each other what we remember of them. Finally we have a friendly argument about which ones are best. My own favourites are *The Ugly Duckling* and *The Emperor's New Clothes*. They are great stories, and they also make me think about how I should live my life. I know I should always try to speak the truth—what I honestly think and feel, even if it's not popular. And if I want to grow up to be a "swan" some day, instead of remaining an "ugly duckling," one thing is clear: I'd better get a bit braver than I am now.

After our tour of Odense, we are taken to a huge shipbuilding yard several kilometres north of the city. It has turned cold. It is -3°C, a noticeable change from the +3 and +4 temperatures we have enjoyed since last week. To our surprise, many of us actually feel colder in Denmark's damp air at -3°C than we do where we live when it is -30°C. Thin ice covers the shallow puddles in the yard. I can't resist stepping on the ice to hear it crunch as it breaks.

The shipyard is awesome. It covers a huge area. We are told that 6000 people work here, but



Foreign vessels are tied to the dock at the shipbuilding yard. Denmark buys raw or partially finished products from other countries and makes them into finished products to sell.

we do not see that many. We are told that because much of the work is automated, only a few people are needed at each site.

We see huge cranes lifting supplies from vessels that are tied up at the dock. Jimmy asks why supplies need to be brought to the shipyard by foreign ships. Our guide explains. "Except for fish and good farmland, Denmark has few natural resources. So we try to become prosperous in the way Japan does. We buy raw or partially finished products from other countries, and make finished products for sale. It works. In this case," he says, "basic steel plates made in Sweden are being off-loaded. They will be made into hulls for ships."

Finally we come to the main action. A supertanker is being built. I can't get over its size. It dwarfs us. It is 365 metres long and when finished, will weigh 270 000 tonnes. We stand amazed and watch. Automated robots, directed by a computer, lift, cut, and shape the heavy steel

plates and eventually weld them together to make the hull. Our guide tells us that six or seven of these tankers are built every year in this yard.

Niels reminds us proudly that Denmark has had a seafaring tradition, just like Norway. It is the continuing tradition of shipbuilding skills among Danes that has resulted in the success of this yard. Ms Larsen agrees with him. She adds that it is Denmark's geographic position, almost surrounded as it is by water, that first gave rise to the seafaring tradition.

After saying goodbye to our friends in Odense, we move on to the mainland part of Denmark, called Jutland. There we travel to the city of Billund where we see Legoland Park.

It's amazing! Lego blocks have been used to build thousands of complex things like elephants, ships, and fairy-tale houses! We also go on to Hobro to see the preserved remains of a circular fortress built during the Viking Age. It is

fascinating to see and touch things built by human hands so long ago.

Finally it is time to leave Denmark. We say farewell to Ms Larsen, then board our bus for a combination bus and ferry ride to Sweden. Once on the bus, I gently scold myself for having taken the idea of a holiday in Denmark too literally. I should have used some spare time for organizing and developing my notes. I haven't done one bit of work. I still have thank you notes to write, too! Trying to build up some enthusiasm, I reach into my pack, pull out my notebooks, and get to work.

SEARCH

Compare and contrast the government in your country with the Government of Denmark.

What is the most significant difference between these two governments?

THINK

Explain the difficulties of trying to expand the common citizenship idea of the Nordic Council to the whole circumpolar world. Imagine that the regions in the circumpolar world have decided to join together to form one country. On a map, draw out the territory of this new country. What would it be called? Where would the capital city be located? What form of government would it have? What would be the official languages? How would the different cultures within this new country be protected?



Legoland is an amusement park full of giant Lego blocks.

WEB LINKS

eLibrary

<http://elibrary.bigchalk.com/libweb/canada/do/login>

NWT access - Username: govont0201 Password: elca

CultureGrams

Address: <http://online.culturegrams.com/>

NWT access - Username: govnorthwest Password: welcome

The Official Travel Guide to Denmark

<http://www.visitdenmark.com>

The Official Website of Denmark

<http://www.denmark.dk/en>

Denmark – Britannica Encyclopedia

<http://www.britannica.com>

Copenhagen this Week

<http://www.ctw.dk/>

The Copenhagen Post

<http://www.cphpost.dk/>

Sweden

CHAPTER 7

Ulrich Winberg greets us when we reach Stockholm, welcoming us to “the heart of Scandinavia.” He gives us our usual packages of information, then assigns Reino and me to live with the Strang family. Unlike many Stockholmers who live in apartments, Hjalmar and Sonja Strang live in a detached home with their children Ingrid and Gunnar.

We discover that it is the eve of the Feast of St. Lucia, the patron saint of light. Under the old Julian Calendar, the night of December 12-13 was the longest night of the year. The Swedes

have traditionally celebrated The Festival of Light on December 13, when the days start to get longer again. (This is usually December 21 in the Gregorian calendar.)

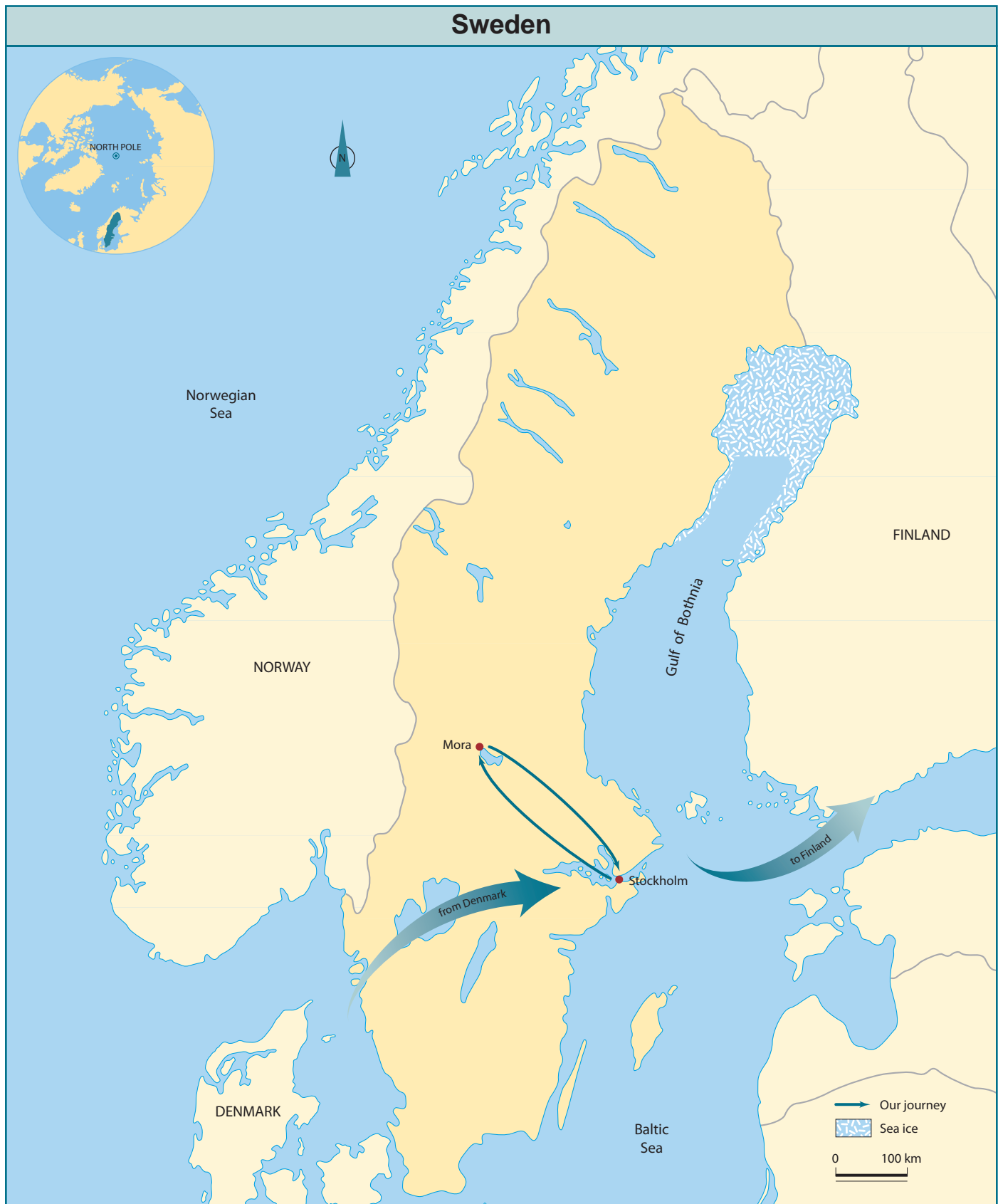
To greet us, and to celebrate The Festival of Light and the beginning of the Christmas season, the family has prepared a wonderful *smörgåsbord*. There are cold fish dishes: anchovies, sardines, herring, and salmon. There are cold meats: liver pate, smoked reindeer, and ham with vegetable salad. There are mushrooms that they gathered in the countryside last summer. There are hot dishes

such as meatballs, sausages, and omelets. There is fresh bread with raspberry and blueberry jams. There are fruit salads and pastries for dessert. It is a feast!

Reino and I are awakened before dawn the next morning to observe the family’s festival ritual. Ingrid is the Lucia Girl, symbolizing the return of light. She wears a long white dress. She places a crown of candles on her head and Gunnar lights them. Then, singing a traditional song, they walk to the bedroom to awaken their parents. They carry a



This is a traditional type of house that is found in the suburbs of Stockholm.



Although we have only two stops in Sweden, we have so much to learn about this country.

traditional offering of saffron buns, ginger cookies, and coffee. “Bread for hunger and candles to light the darkness,” Ingrid says. She tells us that this

ceremony is taking place all over Sweden at this very moment.

After breakfast we tour Stockholm by bus. It is dawn. The street lights are still on. A gentle



S W E D E N



BASIC FACTS

Formal name: Kingdom of Sweden

Common name: Sweden

Area: 449 964 km²

Area north of 60° latitude: 70% of total (est.)

Population: 9 031 088 (2007 est.)

Life expectancy: males, 79; females, 83 (2008 est.)

Ethnic mix: mainly Swedish; small number of Sami; immigrants make up 12% of population (mostly Finns, Yugoslavs, Norwegians, Danes, Greeks and Turks)

Capital city: Stockholm

Population of capital: 795 000 (2007)

Other major population centres: Goteborg, Malmo, Uppsala, Linkoping, and Orebro

Government: a constitutional monarchy; a representative democracy with a parliamentary system; led by a prime minister and cabinet; the legislature is comprised of one elected house, the Riksdag

Currency: Swedish krona

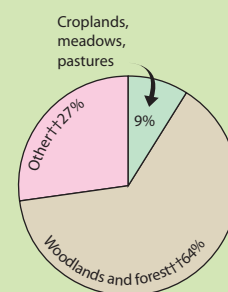
Natural resources: copper, iron ore, lead, silver, gold, uranium, zinc, timber, hydro power, arsenic, feldspar

Exports: \$176.5 billion US\$ (2007 est.) —machinery, motor vehicles, iron and steel products, paper products, pulp and wood, iron and steel, petroleum and petroleum products, chemicals;

main destinations: Germany 9.4%, UK 7.1%, Denmark 7%, France 5%, Finland 6%, Norway 9% US 9.3%

Imports: \$157.2 billion US\$ (2007 est.) —machinery, motor vehicles, iron and steel, petroleum and petroleum products, chemicals, foodstuffs, clothing;

main sources: Germany 17%, UK 6%, Denmark 9%, France 5%, Norway 8%, Finland 6%, US 8%



Land Use

THUMBNAIL HISTORY

The whole of Sweden was covered by an icecap 15000 years ago. As the ice receded, people moved into the area. The first sign of human habitation dates from about 10 000 BCE. The earliest people hunted, fished, and used stone tools. The Stone Age lasted until about 1800 BCE when bronze tools and weapons appeared. The Bronze Age ended about 500 BCE. From that time, agriculture became a foundation of the Swedish economy. Many people began to live in settlements. By then, people were making implements and weapons from iron. The Sami established themselves in northern Sweden around the same time that other European peoples were moving into its southern regions. They followed a semi-nomadic way of life. Like Norway and Denmark, Sweden passed through the Viking Age. Viking expeditions from Sweden were generally directed eastward, however, to the Baltic states and the big rivers of Russia. Vikings travelled as far as the Black Sea and the Caspian Sea and established trade links with

the Byzantine Empire and with Arab traders. During this period, the old Nordic religion was practiced in Sweden. It passed out of use with the advent of Christianity in the twelfth century. Sweden was unified as a single country under a monarch in the thirteenth century, but it soon fell under the control of Denmark. It established its independence from Denmark in 1521 CE and went on during the next two centuries to acquire territories of its own. Sixteenth century tax records show that the nation controlled the northern Sami at that time. The monarch demanded furs, animal skins, dried fish, and reindeer products as payment for taxes. By the sixteenth century, the Catholic church had lost its power in Sweden. Its lands were taken by the state and Protestantism was introduced. The Evangelical Lutheran Church became the established church, as it is to this day.

Following the Napoleonic Wars in 1814, Sweden acquired Norway from Denmark. This relationship was dissolved in 1905 when Norway gained independence. Since the beginning of World War I, Sweden has followed a policy of non-alignment in world affairs. This means that it does not support or join other nations in military alliances. During wartime it declares neutrality. It does not fight for either side; it maintains diplomatic and trade relations with both sides.

Because it is non-aligned, Sweden must be prepared to stand alone if it is attacked. Sweden maintains modern armed forces for defence. It also has a weapons industry. Producing weapons helps Sweden reduce its reliance on other countries.

Sweden became a full member of the European Union on January 1, 1995. By joining it, Sweden might find it necessary in the future to change its non-alignment policy.

snow falls and the temperature is -4°C . Here and there in the streets we see people wearing white gowns, singing by candlelight. It is a wonderful way to welcome the return of lengthening days and the Christmas season.

Stockholm is more than 700 years old. Much of the city is built on islands. Nearly 50 bridges link various parts of the city. Old buildings and new blend together. They make an attractive picture as we drive through the streets.

Over the next several days we visit a number of places in Stockholm to learn about the Swedish social welfare system. Sweden was one of the first countries in the world to develop social programs which help to ensure that people who are **unemployed**, have low incomes, are physically or mentally disadvantaged, or who are elderly or sick can still lead comfortable, dignified lives.



This is one of the narrow, old streets in Stockholm.

THE SWEDISH WELFARE SYSTEM

Over the years Sweden developed social programs to meet special needs. State loans have helped newly married couples buy furniture and establish homes. Expectant mothers have received free prenatal and delivery care. This has meant that Sweden's infant mortality rate is one of the lowest in the world. Expectant parents can get 12 months' leave from their employment with the arrival of their child. They can receive benefits from the Social Insurance Office equal to 80 per cent of their income. This paid leave of absence may be divided between the parents, but it cannot be used by both at the same time.

Parents receive a cash payment on the arrival of a child and a monthly allowance for each child under sixteen. Child care assistance is widely available to parents for fees that cover only about 10 per cent of the actual costs. The government pays the remaining costs. In addition, study allowances are offered to families if their children remain in secondary school or attend college or university.

Swedes have a national health insurance program. It provides medical care, medicines, hospitalization, and dental care either free or at a low cost. Employees receive taxable cash benefits that compensate them for some of their lost income when illness causes them to miss work. They also receive compensation if they are injured on the job and unable to work. Most employees receive five weeks' paid vacation each year. Low income families can receive tax-free housing and vacation allowances.

All Swedes are entitled to a pension at age 65, regardless of previous work history. In addition, there is a second pension based on a person's earnings during his or her best 15 years of income. Together, these pensions ensure each working Swede a pension income equal to about two-thirds of his or her former income. There are also personal care services available to the elderly at a small cost.



The Swedish government offers child care assistance to parents, including study allowances for children who stay in secondary school or go to college or university.

None of the social services is actually free, of course. The government pays for all of them with revenue raised from taxes. Sweden has among the highest income taxes in the world. When the economy crashed in the early 1990s, the country had to make some economic reforms in their social network programs, but they continue to offer some of the strongest social service programs of any other country.

In spite of current difficulties, the system seems to have worked well. The percentages of people in Sweden who are very wealthy or very poor are smaller than in most countries. Most Swedes belong to a fairly prosperous middle class. There are no slums in Sweden. Beggars are seldom seen. There is also a low rate of violent crime. Yet it is not a perfect society. Like everywhere else, Sweden has social problems such as alcoholism, drug issues, and suicide.



The Nobel medal is awarded for excellence in Physics, Chemistry, Medicine, and Literature.

The day before we leave Stockholm for a brief side trip, we go downtown to see the shops. As we are walking along a main street, a black limousine stops at a fancy hotel. A few people stop to watch as the occupants, a woman and two men, leave the car and enter the hotel. Someone says they are the winners of the Nobel Prize for Medicine. They have come to Stockholm to be

honoured and to receive their prize. Sweden was the home of Alfred Nobel, who created and first gave the famous prizes. It is exciting to see the winners. I must check the newspaper for their names so I can tell my parents I saw them.

The following day we go to Mora. We will spend a few days in the interior learning about the Swedish lifestyle. The temperature is a few degrees colder than at Stockholm. Snow covers the ground and makes the spruce and pine trees look more beautiful. Birch trees, naked without their leaves, look cold and brittle against the blue sky. It is picturesque.

We spend a part of every day cross-country skiing and observing nature. One day when I am skiing alone, I suddenly come across a young moose (called an elk in Europe). He seems less surprised than I am. He holds up his head alertly for a few seconds, then turns, and trots off into the bush. Later, no one believes my moose story.

Following these outings, we gather in the school library for hot chocolate, lectures, and discussions. One thing we learn is that sport and the outdoors are very important to people here. And as in Norway, cross-country skiing is a favourite sport.

We learn that Mora is the finish line for what must be the biggest cross-country ski race in the world, the Vasa Race. In March each year, skiers start at Salen and race 90 kilometres to Mora. This race is so popular that only 14 000 skiers are allowed to start from Salen each year, although many more apply to participate. Alpine skiing, skating,

ice hockey, and gymnastics are also popular here.

In summer, soccer is the favourite sport. There are more than 3000 soccer clubs throughout the country. Since 1975 Sweden has played host to Gothia Cup, the world's biggest international youth tournament.

Other favourite sports include sailing, canoeing, swimming, tennis, and orienteering.

Orienteering is a timed, cross-country race in which runners use maps and compasses. Mr. Winberg proudly reminds us of Swedes who have been world tennis champions. Most of us recognize at least one name.

Mr. Winberg says that in Sweden, sports participation, good health, and fitness are more important than attaining excellence. He says Some 4.4million Swedes belong to regional sports clubs and that accounts for about half of the Swedish population of 8.8million. These clubs are a big part of the nation's social life.

Reino and Mary are both excellent players. Mary played for the Northwest Territories in the last Arctic Winter Games and her team won the championship. We are happy to win of course, but what is most important, as Ms Bohnet reminds us, is that everyone has had a good time, and made new friends.

We return to Stockholm in time for Christmas. The Strangs have prepared for the holiday. Their decorated evergreen tree stands in their living room. They have another fine feast ready for Christmas Eve. The tasty meal of

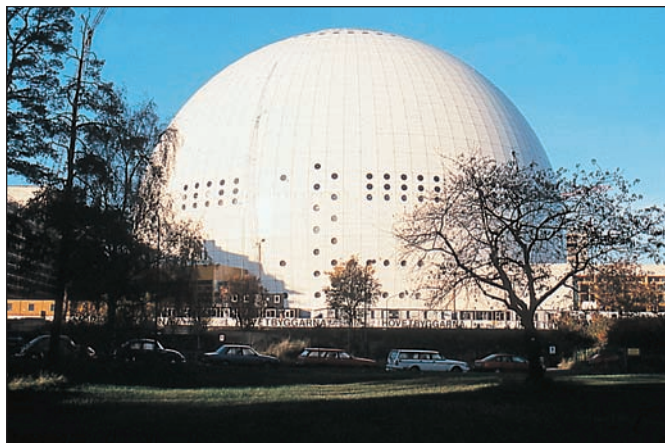


The Vasa Race is the largest cross-country ski race in the world. The race trail is 90 kilometres, from Salen to Mora.

While we are in Mora, we play a game of indoor soccer against the local school team. I volunteer to be the goalkeeper because I think I am a better defender than attacker. Unfortunately, besides one goal that our opponents really earned, I let in two goals that I should have stopped. We win anyway, 5 to 3. We win mostly because

ham and herring is topped off with rice pudding which has a single almond in it. Gunnar gets the almond. Tradition says that he will have good luck throughout the new year.

After eating, we gather around the tree and open gifts that they say were brought by a lively elf named *Jultomten*, a Santa Claus helper. With



Swedes participate in sports to keep healthy. This is the Globen sports arena in Stockholm.

a wink, Mr. Strang asks us if we saw Jultomten in Mora, because that is where he is believed to live. I have to confess that I hadn't seen a single one of his long silvery whiskers—only a moose!

On Christmas Day we go with the Strang family to the Evangelical Lutheran Church. The service is similar to the church service at home. Most Swedes are members of the Lutheran Church, but only a small number attend regularly. The congregation grows enormously on special feast days such as Christmas and Easter. After the service, people greet one another, saying “*God Jul*,” which means, “Merry Christmas!”

Later in the day I wish my own family a merry Christmas when I talk to them on the telephone. After I hang up, I realize I am not as homesick as I was a couple of months ago. Maybe I have grown up a little.

During our last week in Sweden, we focus our attention on industry and the environment. We learn that Sweden is rich in minerals and that it is a highly industrialized country. Mines produce iron ore, copper, lead, zinc, silver, and gold. Mills produce high quality steel. Industries manufacture such things as electrical equipment, ships, cars, trucks, buses, railroad cars, aircraft, and even various armaments.

We also learn that the environment is very important to Swedes and to their government. The Swedish parliament adopted an important policy on the environment in 1991. It set up the National Environmental Protection Agency to help make sure the policy is put into practice.

One day we visit a nuclear power station. Mr. Winberg tells us there are 11 such stations in Sweden producing electrical power. He says that at one time the Swedes thought nuclear power was the answer for reliable, non-polluting electrical power production. This is because nuclear reactors do not ordinarily contribute much to environmental pollution. They do, however, present the problem of what to do with spent fuel.

The hopeful attitude of many Swedes changed in 1979 when an accident occurred at the Three Mile Island generating station in Harrisburg, Pennsylvania. No one was killed or injured, but a near melt-down of the reactor core frightened many people world wide. It could have led to a serious release of **radiation** into the environment.

This accident prompted a public discussion of nuclear power in Sweden. A referendum was held. People were not asked whether they would like to continue to use nuclear power. Rather, they were offered a choice as to how quickly the nation's reactors should be shut down. The majority of Swedes voted for slowly phasing out the use of nuclear power.



Santa Claus is a part of the Christmas celebrations in Sweden.

SWEDISH ENVIRONMENTAL POLICY

The Swedish environmental policy is quite different than many countries. The policy is based on the idea that environmental sustainability must be met in every field. This means that almost every political decision is viewed with an environmental sustainability lense.

A lot of attention is paid to lifestyles, consumption patterns and community organization and planning. The Swedish government believes that ecological sustainability must involve ecological, social and economic aspects and they must be balanced if the objective of ecological sustainability is to be achieved. The goal of the Swedish government is to hand over to the next generation a society where the major environmental problems have been solved.

This means there will be no pollution, natural resources will not be depleted and ecosystems are healthy. The three objectives of the policy are:

- protection of the environment – to reduce environmental impact to a level that does not exceed the environment's natural capacity to deal with it.
- Sustainable supply – conservation of long-term productive capabilities of soils, forests and water resources, focusing on a use of renewable raw materials
- Efficient resource use – using energy and other natural resources more efficiently.

Laws in Sweden to support the environmental policy are quite strict.

Many felt the wisdom of their decision to shut down reactors was confirmed when a dreadful accident occurred at Chernobyl in the Ukraine in



Sweden has an environmental policy that seeks to preserve the country's natural habitats and to protect the health of its citizens.

1986. A big release of radiation occurred there. Many people died, and are dying, from it.

The radiation was carried far and wide, including to northern Scandinavia where it settled on lichen, an important food for reindeer. Some reindeer had to be destroyed; others were herded by Sami to pastures that were not contaminated by radiation.

The issue of nuclear power is still being discussed today. Significant numbers of Swedes now think that the nuclear reactors should not be shut down after all. They say that this would cause a big increase in the price of electricity. In turn, it would increase the price of manufactured goods. High-priced goods would be difficult to sell on world markets. They also argue that if nuclear power is phased out, there will be a big increase in pollution from the oil-burning or coal-fired electrical generators that would replace them. Currently nuclear power generation in Sweden is 69.2 TW h, about the same as during the late 1990's.

I think this is very interesting. I would like to gather all the facts I can on nuclear energy, and think about the issue before I decide whether it should be used to produce electricity or not.



The Chernobyl nuclear accident affected more than just Ukraine. The radiation travelled to nearby countries,

SEARCH

What measures do your local government take to protect the environment? Discuss – In what ways do you as an individual act to protect the environment? In what ways do you harm the environment?

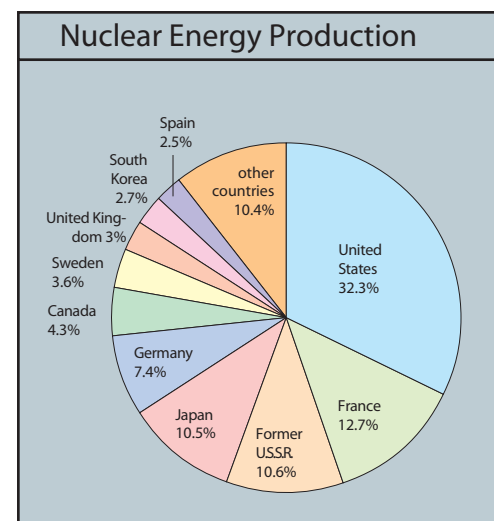
Write a letter to your local government suggesting the best action that can be taken to protect the environment in your region.

SEARCH

Who will be the first group of people to be affected by global warming? Create a visual display to warn people in the south of the effects of global warming on the circumpolar world.

I feel proud of myself as we leave the power station. I had been a bit worried about radiation when we were told we would visit the reactor. I didn't want to go on being an "ugly duckling," though, so I decided that I wouldn't let the thought of radiation bother me. Scientists work at the power station every day. They wouldn't do that if they thought it was dangerous. So I relaxed and enjoyed the visit.

Back at our lodgings, Reino and I pack. We say a fond goodbye to the Strangs who have been so good to us. We then join our group for the short trip to Finland. How quickly time passes. It is already a new year!



Who are the top two producers of nuclear energy?

THINK

Consider the role that individual attitudes play in causing pollution. Suggest ways in which undesirable attitudes can be changed.

The Island of Gotland



Medieval castle city in Visby has been named a UNESCO World Heritage Site

Visby is the only city on the Swedish island of Gotland; it is arguably the best-preserved medieval city in Scandinavia and has been named a UNESCO World Heritage Site. Among the most notable historical remains are the 3.4 km long stone wall called Ringmuren ("the Ring Wall"), that encircles the city and the old church ruins. The name "Visby" comes from the Old Norse Vis, (genitive singular of Vi) meaning sacrificial place, and by, meaning "city".

Its population is 22,236 (2005), and it is the seat of the Governor of Gotland County. Like other towns and cities in Sweden, Visby is not a political or administrative entity of its own. It forms an integral part of Gotland Municipality, of which it is the seat.

Gotland is a county, province and municipality of Sweden and the largest island in the Baltic Sea. At 3,140 square kilometers in area, it makes up less than one percent of Sweden's total land area. The region also includes the small islands of Fårö and Gotska Sandön to the north, and the tiny Karlsö Islands to the west.



Visby is the only city on the Swedish island of Gotland

WEB LINKS

eLibrary

<http://elibrary.bigchalk.com/libweb/canada/do/login>

NWT access - Username: govont0201 Password: elca

CultureGrams

Address: <http://online.culturegrams.com/>

NWT access - Username: govnorthwest Password: welcome

Official Gateway to Sweden

<http://www.sweden.se/templates/cs/Frontpage.aspx?id=1898>

Wikipedia – Sweden

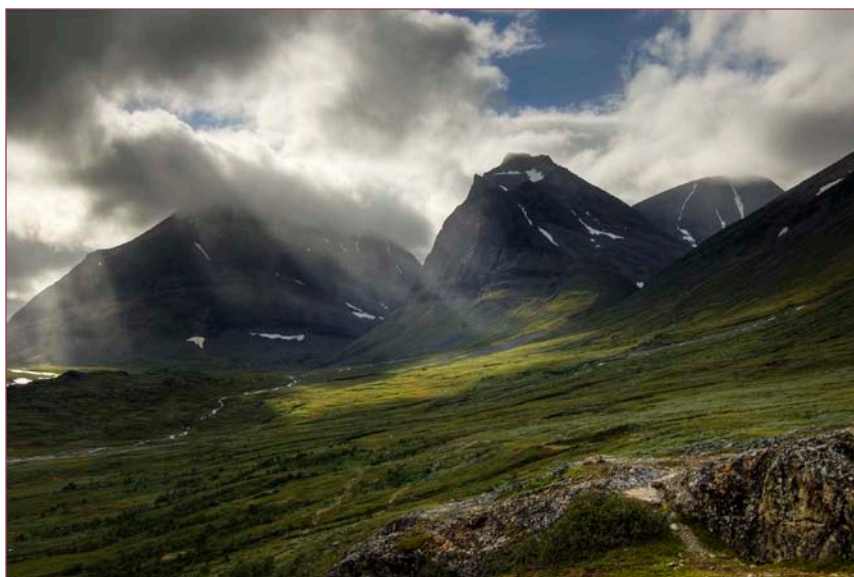
<http://en.wikipedia.org/wiki/Sweden>

Official Tourism and Travel site

<http://www.visitsweden.com/Default34593.aspx>

Smorgasbord – The Shortcut to Sweden

<http://www.sverigeturism.se/smorgasbord/>



Kebnekaise, view from Tuolpagorni

Kebnekaise (from Sami Giebmeváisi or Giebneváisi, “Cauldron Crest”) is the highest mountain in Sweden and Sápmi. The Kebnekaise massif, which is part of the Scandinavian Mountains, has two peaks, of which the southern, glaciated one is highest at 2,104 metres (ca. 6,900 ft) above sea level at the latest time of measurement. The north top (2,097 m) is free of ice. Kebnekaise lies in Lapland, about 150 kilometres (ca. 90 miles) north of the Arctic Circle and west of Kiruna near the popular Kungsleden hiking trail between Abisko and Nikkaluokta.

Finland

CHAPTER 8

The modern ferry we sail on across the Baltic Sea to Finland is like a fancy, floating hotel. When we reach Helsinki, we find that the harbour is iced over. However, a sturdy icebreaker is working hard. Ms Bohnet says she has read that Finland specializes in building icebreakers and that the Finns use them to keep their ports open throughout the winter.

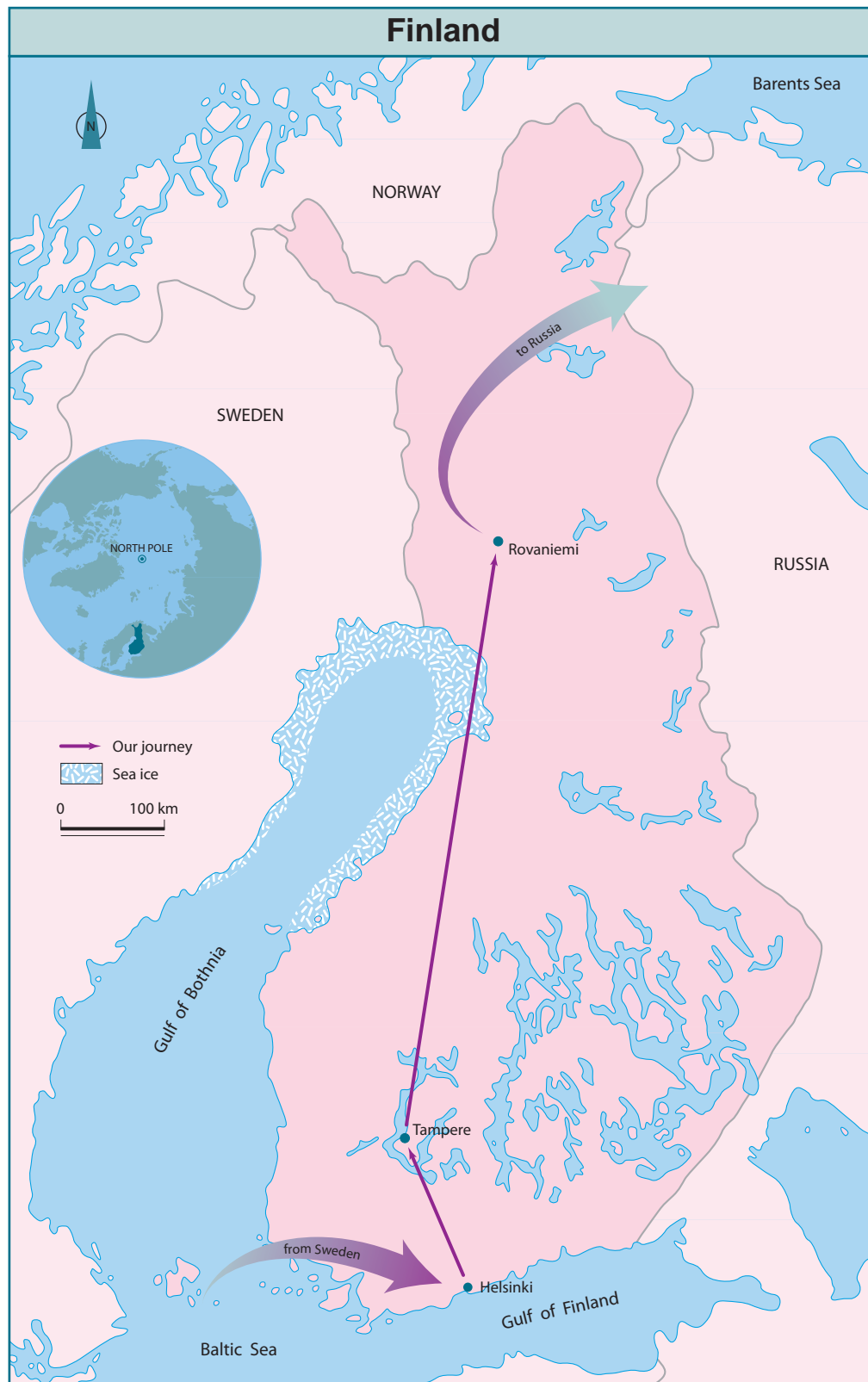
When we disembark, Anna-Maija Nikkanen greets us. She represents the government of Finland. She tells us that we will spend several days in Helsinki, then go to Tampere, and finally to Rovaniemi on the Arctic Circle. After we sort out the administrative details, Johannes Qukausiqtog and I are taken to the home of Eliel and Terttu Aho. I have always admired Johannes' boldness in dealing with new things, so I am looking forward to getting to know him better. I think I can learn something from him.

There are very few hours of daylight as we travel around Helsinki. We leave our billets in the morning when it is dark, and return when it is dark.

The first few days in the city we learn a lot about Finnish design. The Finns pride themselves in having an eye for style. They apply this talent to practical, everyday objects



The ferry between Sweden and Finland is like a fancy, floating hotel. The Finnish flag is in the foreground of this photograph.



Finland is the last Scandinavian country we will visit. We have three stops here.



FINLAND



BASIC FACTS

Formal name: Republic of Finland

Common Name: Finland (Suomi to the Finns)

Area: 338,145 km

Area north of 60° latitude: 99% of total

Population: 5,302,778 (2007)

Life expectancy: males, 78; females, 82 (2008)

Ethnic Mix: mostly Finns, a minority of Swedes, Russians and Estonians, smaller numbers of Sami, Gypsy and Tatar

Capital city: Helsinki

Population of capital: 564,521 (2007)

Other major population centres: Espoo, Lahti, Oulu, Pori, Rovaniemi, Tampere, Turku, Vaasa, Vantaa

Government: a republic and a representative democracy; led by a president and a prime minister and cabinet; the president has wide powers and is elected every six years; the legislature is comprised of one elected house, the Eduskunta. Citizens vote in municipal elections as well as in the European Union.

Currency: Euro

Natural Resources: timber, iron ore, copper, lead, zinc, chromite, nickel, gold, silver, limestone

Land Use: forests and woodlands 85%, croplands, meadows, pastures 8%, other 7%

Exports: \$92.6 billion (2007 estimate)-machinery and equipment, chemicals, metals: timber, paper and pulp. main destinations: Germany, Sweden, Russia, UK, USA, Netherlands

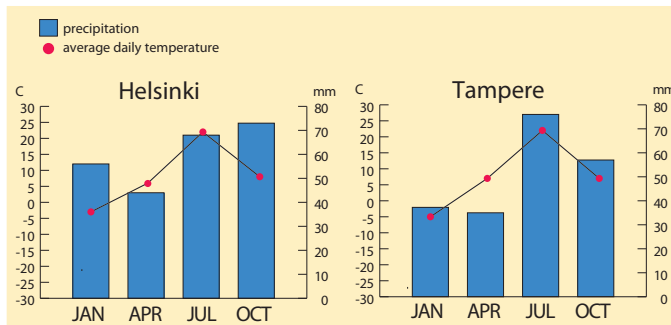
Imports: \$76.4 billion (2007 estimate)-foodstuffs, petroleum and petroleum products, chemicals, transportation equipment, iron and steel, machinery, textiles and grains.

Main sources: Sweden, Germany, Russia, Netherlands, China.(2006)

THUMBNAIL HISTORY

As in other Scandinavian countries, people moved into the area of Finland shortly after the end of the last Ice Age. There is evidence of occupation in coastal areas by Stone Age peoples around 7500 BCE. At the beginning of the Bronze Age, around 1500 BCE, people began to move inland. The Sami established themselves in the northern regions of Finland around this time as well.

From the twelfth century CE onward, Finland was subject to both western influences from Sweden and eastern influences from Russia. Under a treaty signed by Russia and Sweden in 1323 CE, most of the inhabited part of Finland became subject to Sweden. Swedish culture began to impact the Finns. Swedish control continued until 1700 CE. In the following century, major wars between Sweden and Russia led to ever



larger parts of Finland falling subject to Russian control, although official Swedish control continued until 1809.

In 1809, Russia finally took over Finland. It set up Finland as a semi-independent country with the Russian Tsar as its constitutional monarch. The Tsar personally had to approve major decisions of the Finnish parliament, but the country was not run by Russian officials. This arrangement allowed the Finns to develop as a nation.

During the communist revolution in Russia in 1917, the Finns took the opportunity to declare their independence from Russia. The new government of Russia (the Soviet Union) accepted Finnish independence. But later, during World War II, the Soviet Union conquered and held parts of eastern Finland. After that war, although it preserved independence, Finland maintained a careful foreign policy, making sure that it did not offend the Soviet Union. On January 1, 1995, Finland became a full member of the European Union. This is seen by Finland as a confirmation of its western traditions and links.



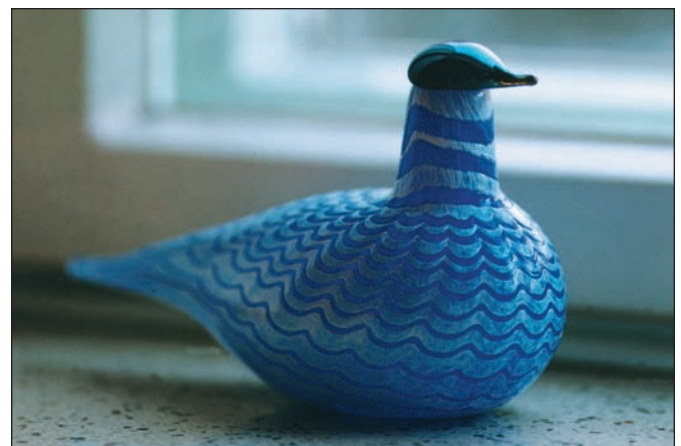
Kamppi Center is a shopping and transportation complex in the Kamppi district in the centre of Helsinki.

such as chairs and cups, and turn them into objects that have a striking artistic style.

We visit plants and shops where kitchenware, bathroom fixtures, dishes, utensils, cutlery, jewelry, glassware, ceramics, and furniture are made and sold. After many visits, we begin to see common features in all these Finnish designs. The lines are generally simple, and the shapes are clean and uncomplicated. The designs are practical. They give the items an impression of being user-friendly and long-lasting. They never look cheap or shoddy.

The Finns' fascination with design affects heavy industry as well. Through the week we see it displayed in mining, farming, and logging machinery, electric generators and transformers, paper-making machines, and sailboats!

One day we go to a fashion show. The up-beat music, models, and lights make it very exciting. We see beautiful fur coats sewn from pelts produced on fur farms: fox, raccoon, and



This bird is an example of Finnish glassware.

mink. There are soft, beautifully coloured leather garments and a big variety of leather footwear. What really turns us on is the colourful ski and sportswear. It is smashing! Ms Nikkanen knows the organizers of the show, so we go backstage afterward and try on some of the clothes.

At the end of the first week we change our focus. We spend a day learning about Finland's government. In the evening, after our tour of government buildings, government officials host us at a traditional Finnish meal. We begin with a

hearty fish soup. Then we have stuffed pike, liver and rice casserole, cucumber salad, creamed mushrooms, cabbage rolls, a coffee bread ring topped with slivered almonds, and Karelian pies. The soup is called kalakeitto and the bread is called pulla. They are the only Finnish names I remember.

Following dinner, the government treats us to a night at the opera. The opera is called *The King Goes Forth to France*. I find some of the singing, especially the solos, too fancy and boring. But I do like the chorus numbers. They are powerful, inspiring. The orchestra is great. And I like the sets, costumes, and lights. Sometimes it all comes together in a wonderful explosion of movement, colour, and sound.

The next day we say goodbye to our friendly hosts, Eliel and Terttu Aho, then leave for Tampere. It is in the interior of Finland. On the way we can easily



Karelian pies are a traditional food from eastern Finland. They are usually eaten with a mixture of butter and boiled eggs.

see why Finland is known as a land of forests. There are trees everywhere—huge stands of pine, spruce, and birch. Ms Nikkanen tells us that about 85 per cent of the country is covered by forests.

Forestry has long been the cornerstone of the Finnish economy. In

THE FINNISH SYSTEM OF GOVERNMENT

Finland is a republic. It has a presidential system. The president is chosen by direct election of the people. There is a run-off election if no candidate receives an absolute majority in the first round of voting. Only the two top candidates will be on the ballot for the second round. In this way, the president will have more than 50 per cent of the popular vote.

The president is powerful. She or he appoints the prime minister and cabinet **ministers**, who must then keep the support of parliament to stay in office. The president can temporarily **veto** bills passed by parliament, and can dissolve parliament and call new elections. The president conducts Finland's affairs with other countries and is also the commander-in-chief of the armed forces.

The Finnish parliament is elected by a system of *proportional representation*. This means that the percentage of parliamentary seats a political party receives following an election is approximately equal to the percentage of the popular vote that it gets. Parliament's members sit for four years unless the president dissolves parliament earlier.



The Finnish parliament meets in this building in Helsinki. Finland has a presidential system.

the past, farmers often added to their income by logging their property in the winter.

Finland produces several different forest products. These include lumber, plywood, particle board, wood pulp, newsprint, and printing and writing paper. An industry has also been developed to prefabricate wooden buildings. All of these products are exported to other countries. Because of all this activity, the forest industry provides an

important source of employment and income for about 10 per cent of the population.

The government tries to ensure that the forests are preserved. Forest companies are bound by law to plant new trees after cutting. The government also works to ensure that the forest industry does not damage the environment. Pulp mills, which have released chemicals like sulphur, phosphorous, and chlorine into the environment,

are now regulated. They have developed new processes to reduce the amount of hazardous chemicals released into the water and air.

There is also a fairly successful paper recycling program in Finland. In recent years, about 70 per cent of paper that is suitable for recycling has been recovered.

Over 50 per cent of the forested land in Finland is owned by private individuals. Eight per cent is owned by companies; the government owns the rest. All Finns enjoy an ancient right to use these lands. They may enter the forests to gather mushrooms, pick berries, or even to camp. This right is respected unless they cause property damage or disturb the landowner.

Around Tampere we visit timber-cutting sites, sawmills, pulp mills, and learn about the forest industry. We also take some pleasure trips. On one, we visit a



Compare the amount of forests in Finland to the other Scandinavian countries. What conclusions can you draw about the land in Scandinavia?

country cottage. Many Finns own cottages in the countryside. They travel to these cottages from their city homes throughout the year. In summer they might boat, swim, hike, pick berries, and gather mushrooms. In winter they enjoy cross-country skiing. Most cottages have a sauna attached to them.

I guess I could say that the sauna is like a hot-air bath. It is a ritual here. Most Finns have a sauna at least once a week, often on Saturday evening. The whole family may have a sauna together. Family members use it to cleanse their bodies, relax, and calm themselves. They say it gives them a sense of well being.

Our hosts invite us to have a sauna. Reino says we can't truly understand the Finnish soul



Forestry is the cornerstone of the Finnish economy. The forestry industry creates products such as lumber, plywood, wood pulp, and paper.

unless we try it. We all feel a bit awkward about taking off our clothes and sitting around naked with others, but eventually we agree—only if the boys and girls are separated. Reino jokingly says that isn't necessary, but Ms Bohnet insists that it is.

We all feel wonderfully fresh and very much alive after the sauna. Ms Nikkanen, Ms Bohnet, and our hosts enjoy a traditional cup of strong, hot coffee. The rest of us finish the visit with delicious hot chocolate.

One day we go to a hill to watch a ski-jump demonstration. It is a favourite sport of many Finns. After the demonstration, Johannes insists on trying. Ms Bohnet frets, but she allows him to use a small jump for learners. He does just fine. I summon my courage and try, too. I am

embarrassed when I tumble after landing. When they see I'm not hurt, everyone laughs at my face full of snow. In spite of the laughter, I feel good inside for having tried. I laugh, too.



This is the outside of a Finnish sauna. Most Finns go to the sauna at least once a week.

At the beginning of the third week in Finland, we fly on to Rovaniemi. It is located very close to the Arctic Circle. The temperature is -20°C when we arrive. There are only a couple of hours of daylight in every 24 hours.

We spend the first few days visiting schools in the area. Nine years of schooling are compulsory for Finnish children beginning at age seven. Pre-school, secondary, and vocational education are voluntary

The highest levels of education, for students 19 and older, are taken at universities and adult education institutes. We visit one in Rovaniemi, the University of Lapland. One of this university's



Inside the sauna, water from this pail is poured over hot rocks to create steam.

most interesting features is the Arctic Centre. It is an international arctic research institute, and an international committee of scientists advises it. They come from Finland, Norway, Sweden, Denmark (Greenland), the USA (Alaska), and Canada. The Centre's work focuses on the natural conditions, culture, technology, economy, and environmental problems of northern regions.

The Arctic Centre is located in a building called Arktikum House. The design of this building is fantastic. Surrounding the building there are gardens with plants and shrubs that are native to

the Arctic. From these gardens we can see a long, arched glass corridor, brightly lighted, pointing northward and running into a hillside. And that is all we see of the building, because its rooms are underground.

One night when we are standing outside the Centre, the northern lights start dancing in the sky. As they reach down toward us, I get the strange feeling that they are the source of power that lights the long glass corridor.

We also visit the museum, the art gallery, and the local church in Rovaniemi. The church

COMPREHENSIVE SCHOOLS IN FINLAND

Beginning at age seven, everyone receives nine years of basic education in comprehensive schools. The first six grades are the junior level. Junior level students attend school for about 26 hours each week. In each grade all students take the same subjects: religious knowledge, mathematics, environmental studies, Finnish (or Swedish, if that is the child's mother tongue), foreign languages (usually English), history, social studies, civics, biology, **geography**, physical education, music, art, and handicrafts.

The next three grades are the senior level. Senior students attend school for 30 hours per week. New compulsory subjects are added: chemistry, physics, home economics, and the second official language (Finnish or Swedish). Students at the senior level can also take extra subjects such as economics, agriculture, computer studies, or additional languages.

In the Sami home area, schools are a bit different. Under Finnish law, school authorities have a duty to make it possible for Sami students both to learn in the Sami language and to learn about their language as well.



Finnish children begin school at the age of seven. They go to comprehensive school for nine years.

SECONDARY AND VOCATIONAL SCHOOLS

Most graduates from comprehensive schools continue their education. They enrol in senior secondary schools for three years, or in vocational schools for two to five years.

Senior secondary schools offer academic education. Students study Finnish and Swedish, one to three additional foreign languages, mathematics, physics, chemistry, biology, geography, psychology, religious knowledge, art or music, physical education, and health. At the end of three years students must pass a nationwide exam to graduate. Most graduates apply to go to university, but because the number of university openings is quite limited, some find work and others go to vocational schools.

For students who enter the vocational education stream when they graduate from comprehensive schools, there are as many as 25 different trades and professions they can choose to study.

No matter which trade they choose, all vocational students take the same general course for the first year. In the second year they begin to specialize in their chosen vocation. The specialized courses vary in length and difficulty, lasting from one to four years. Students qualify for higher certificates as they complete each year of training. Those who remain in specialized courses for four years obtain the highest certificates. Upon graduation, students with these certificates are entitled to apply to continue their education at university.

has magnificent wall and ceiling paintings, wood carvings, and beautiful stained glass windows. Every afternoon, I return to the Arctic Centre alone. A biologist there, Irma Kekkonen, has found a wounded gyrfalcon. She is nursing it back to health. I call the gyrfalcon "Thor." I help feed him and watch his behavior. I also examine him closely (and very carefully, of course), and make notes on the adaptations that help him to survive in the



Students who graduate from secondary school get to wear a graduation cap. Every year after, they wear their caps during the May Day celebrations on May 1.

Arctic. (See Chapter 15 for a photograph of a gyrfalcon.)

We end our stay in Rovaniemi with a visit to Lappia House. It contains the Lapland Provincial Museum, a music college, and a theatre. On the last evening we go to a variety show in the theatre. It includes Sami drumming and the chanting of legends. The costumes, movements, and sounds are similar to the production we saw in Kautokeino, Norway a couple of months ago. That helps me to understand that the Sami really are one people even though they live in different countries.

The next day we say goodbye to Ms Nikkanen and all our Finnish friends. Then we board a plane for our flight to Murmansk on the Russian arctic coast. Johannes and I know one another quite well now, so we sit together on the plane. Among other things, we talk about our ski-jumping experience.

SEARCH

Compare the subjects and Aboriginal languages taught in Finland with those taught in your school. What would you like to improve in your system? What do you think is successful?

THINK

Compare the subjects and Aboriginal languages taught in Finland with those taught in your school. What languages are spoken by students in your classroom? Create a class dictionary and record several phrases in as many languages as you can by using the knowledge within your class



An arched glass corridor running into a hillside is all that can be seen of Arktikum House above ground. The rest of the building is underground.

THINK

Create a poster of your ideal school. What would it look like? What subjects would be taught at your school to prepare you for the future as citizens of the circumpolar world? Explain your choices. Invite the principal to your classroom to view your posters.

WEB RESOURCES

eLibrary

<http://elibrary.bigchalk.com/libweb/canada/do/login>

NWT access - Username: govont0201 Password: elca

CultureGrams

Address: <http://online.culturegrams.com/>

NWT access - Username: govnorthwest Password: welcome

Virtual Finland-your window on Finland

<http://www.virtual.finland.fi>

finnfacts

<http://www.finnfacts.com>

The Nordic Pages

<http://www.markovits.com/nordic/finland.shtml>

Russia

CHAPTER 9

The air is cold in Murmansk on January 23, but the greeting is warm. Viktor Gagarin, wearing a big fur hat and a big smile, welcomes us. He has charming gifts for us—hand-painted wooden figurines.

As Mr. Gagarin guides us from the terminal to our waiting bus, we notice how dark it is even at 3:00 PM. The sun has just recently returned to this region after an absence of several weeks. Daylight

hours are still very short. The temperature is -15°C , the air is damp, and a raw wind is blowing. We feel very cold.

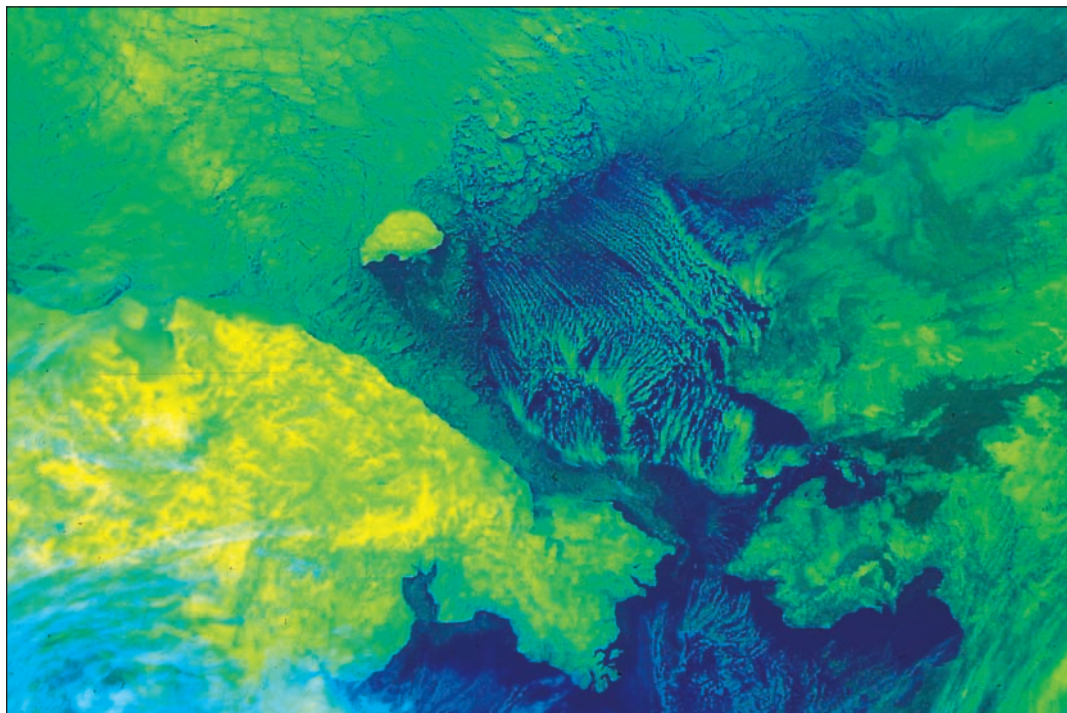
I am billeted with Alfrida Myrdal in Murmansk. We are taken through the darkness to the apartment of Leonid and Vera Tyumen and their sons, Ivan and Vassiliy. Theirs is like so many other apartment buildings we will see in Russia. It is constructed of concrete blocks and its rooms are



The port at Murmansk is open year-round. Lumber, fish, and minerals are exported from here.



We will be experiencing some cold weather in Russia. The temperature in Murmansk is -15°C . The forecast for Yakutsk is -44°C .



This satellite image, taken in November, shows Alaska, Russia, and the Arctic Ocean. In this image, water in the Chukchi Sea (north of Russia and Alaska) is frozen. Just south of the Chukchi Sea is open water with streams of vapour rising above it.



Welcome to Russia!

BASIC FACTS

Formal name: Russian Federation

Common name: Russia

Area: 17 075 383 km² (largest country in the world)

Area north of 60° latitude: 45% of total (est.)

Population: 142 008 838 (2008)

Life expectancy: males, 62; females, 74 (2007)

Capital city: Moscow

Population of capital: population 10,126,000 (2007)

Other major population centres: Archangel, Magadan, Murmansk, Noril'sk, St. Petersburg (Leningrad)

Government: a republic and a federal state; in transition to representative democracy; led by an elected president as well as a prime minister and cabinet; the legislature is comprised of the Congress of People's Deputies and the two-chamber Supreme Soviet

Currency: Ruble

Natural resources: Russia has deposits of nearly every known mineral, including major deposits of oil, natural gas and coal; timber. It is the world's leading exporter of natural gas, and second leading

exporter of oil. Oil, natural gas, metals, and timber account for more than 80% of Russian exports

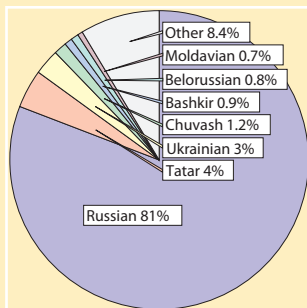
Land use: approximately 7% of the total land area is used for agriculture

Exports: \$365 billion US (2007 est) – petroleum and petroleum products, natural gas, wood and wood products, chemicals, metals,

civilian and military manufactured products; **main destinations:** Europe, China, North America, Japan, Africa, developing nations

Imports: \$260 billion US (2007) – machinery and equipment, high tech products, consumer goods, grain, meat, chemicals, semi-finished metal products;

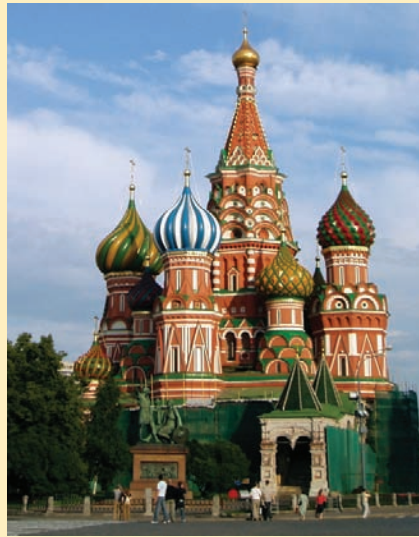
main sources: Europe, China, North America, South Korea



Ethnic Mix

THUMBNAIL HISTORY

The Russian people are Slavic in origin. In their early history they belonged to a medieval Slavic state called Kievan Rus. It was conquered by the Mongols in the thirteenth century. In the fourteenth century a new Russian state emerged further north and east, centered around Moscow. It was called Muscovy. Under the rule of monarchs called *tsars* and *tsarinas* the Russian state gradually extended its power westward over the Ukraine and Belorussia, and then turned eastward



Saint Basil's Cathedral, Moscow

and northward to Siberia. What became known as the Russian Empire was given stability and strength under the leadership of Peter the Great (reign: 1682-1725) and Catherine the Great (reign: 1762-1796). During these years the Russian Orthodox Church had a powerful role in society.

When it was ruled by monarchs, Russian society was made up of a small class of very wealthy aristocrats and a huge class of poor peasants and workers. This social system was overthrown during the Russian Revolution in 1917. Communists under the leadership of Lenin came to power. They dreamed of creating a society in which everyone was equal and people helped one another to find prosperity and happiness.

Communism is a republican and atheistic movement. The communists abolished the monarchy and destroyed the power of the Orthodox Church. They gave the empire a new name. They called it the Union of Soviet Socialist Republics (the USSR, or the Soviet Union). They also changed the economy so that the state owned all resources and businesses and made all major decisions.

In many ways, the communist economy did not work well. Centralized decision-making did not respond well to local consumer needs. There was over-production of some goods and shortages of other goods. Quality in production was often ignored in order to meet targets

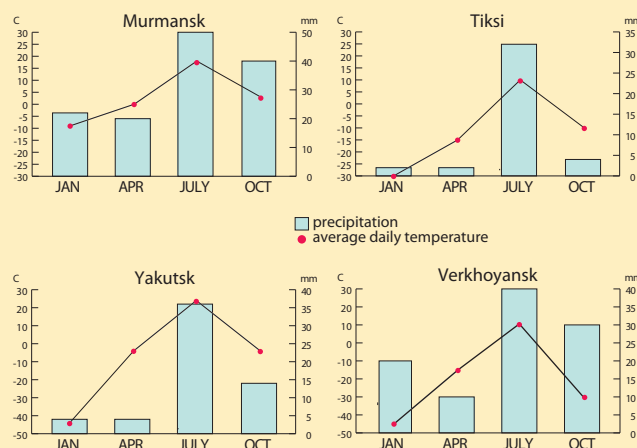
of quantity. People did not have an incentive to work hard because everyone received essentially the same wages. Worker morale was poor.

In the late 1980s, a new communist leader, Mikhail Gorbachev, began to reform the communist system. His reforms included a more open and free society as well as economic change. These reforms were later advanced even more rapidly under the leadership of Boris Yeltsin.

Eventually the communist system fell apart. The Soviet Union was reduced in size because republics, such as Estonia and the Ukraine, declared their independence. In 1991 the USSR was formally dissolved. The new state of Russia is what remains after these departures. Some of these newly independent countries, including Russia (by far the largest of them), have linked themselves in a loose federation called the Commonwealth of Independent States.

The transition from the centrally-controlled economic structure to a more open and profit-driven one has been dramatic and at times difficult. With the rising value of oil and gas exports, and with an increasingly forceful presence on the international front, Russia has seen a huge increase in economic activity and foreign investment.

In Russia today, government remains closely connected to privately owned resources and businesses and Russian citizens are still not free to criticize their government. Besides economic changes, there are important **social changes** in Russia too. A class of business people is developing. There is more unemployment and more crime. Also, the Orthodox Church is regaining an important role in the country.



small. Pictures, tapestries, and ornaments make the Tyumen's home comfortable and welcoming.

The population of Murmansk is more than 300 000 people. It is the largest city in the world north of the Arctic Circle. It is built on the treeless shore of the Kola Inlet, which is an arm of the sea. It is Russia's chief port on the Arctic Ocean.

On our first city tour, we are surprised that the harbour is still open in January. We are told that this is usual. Again, we see the influence of the warm Gulf Stream. Murmansk is an important port because it is open year-round.

During our week in Murmansk, we learn that the city depends upon the sea for its very existence. Murmansk is an export port for lumber, fish, and minerals, particularly iron ore concentrate. To help goods reach the port, a 1000 kilometre railroad links Murmansk with St. Petersburg, a large city further south.

Murmansk is the base for sea fishing trawlers and fishing factory ships. More than half the population of the city earns its living by deep sea fishing or by working in related industries: net making, ship repair, and canning, freezing, smoking and salting fish. A research station for arctic fisheries and oceanography is also found here. The merchant marine training school here particularly interests Jens. There are also huge shipbuilding yards.

Murmansk is also the home of a fleet of icebreakers, some of them very large, like the *Arktika*, and some of them driven by powerful nuclear reactors. These icebreakers do a variety of jobs. For example, they participate in scientific expeditions. They clear paths for ships bringing coal to Russia from Russian coal mining settlements on the Norwegian Island of Svalbard. They also try to keep the Northern Sea Route open as long as possible. This route runs for several thousand kilometres along the coast from Murmansk to the Bering Sea. It was first opened for regular summer traffic by the nuclear icebreaker *Sibir* in 1978.

The efforts of the icebreakers help to ensure that water transportation, even though it is seasonal, is the most important mover of bulk freight in polar regions. Transportation is



This is the railway station at Murmansk. The railway links the city with St. Petersburg.

THE NORTHERN SEA ROUTE

The icebreakers are able to keep freight moving between Murmansk and Dudinka/Noril'sk from early July until late December. At the other end of the continent, from the Bering Strait to Tiksi on the Lena River, they can keep the route open from late June until mid-October. However, they can only keep the central portion of the route, from Dudinka/Noril'sk to Tiksi, open during August, September, and the early part of October. For the remainder of the year the ice is too thick, even for icebreakers.



Icebreakers keep the Northern Sea Route, from Murmansk to the Bering Sea, open as long as possible.

less costly by water than by air. Shipping also allows the movement of much heavier loads. Permanent highways would be too expensive to build and maintain over permafrost in thinly populated areas. Temporary winter ice roads and ice bridges, however, can be effective in limited-use situations.

During our second week in Russia we fly to Noril'sk near the mouth of the Yenisey River. Here we smell and see pollution in the air. It comes from nearby smelters. Noril'sk is the centre of an industrialized area. Nickel, platinum, cobalt, graphite, and copper are mined nearby. There are also important supplies of hydroelectric

power and natural gas. Together these things make Noril'sk the second largest city in the world north of the Arctic Circle. The population is close to 200 000. This busy city is linked by rail to the port of Dudinka on the Yenisey River.

The temperature is -37°C when we arrive in Noril'sk. We do not feel as cold, however, as we did in Murmansk where the

air was damp and the winds were raw. The days are very short here, too.

We have come to Noril'sk to see how the Russians have developed heavy industry in the circumpolar world. We have also come because there is a meeting of The Association of Northern Small Peoples of Russia taking place here. Representatives have come from most of the aboriginal peoples living north of the 60th parallel in Russia. We do not attend their meetings, but meet with some of the delegates to learn about their various peoples.

Professor Malikov guides our classes. He is old, lively, and humorous. He once taught at the Institute of Minority Peoples in Yakutsk. He shows

us videos and slides, and talks about living with several Aboriginal groups at one time or another. He knows some words in their various languages. He is very good at preparing us before we hear from the delegates.

Few of the delegates speak English. They speak Russian and their own language. Professor Malikov and Larisa translate into English. We learn that the population of Aboriginal peoples in circumpolar Russia is about one million. This is a greater number than in all other circumpolar countries combined.

We also learn that Russia's northern Aboriginal peoples have common concerns. Modern industry and immigrant labour bring about change to their lifestyles. Fewer individuals follow

traditional pursuits. Aboriginal leaders are looking for ways to ensure the survival of their cultures and languages.

Everyone in our group is interested in the delegates' presentations. We ask many questions during the week. Jimmy Nevak follows one line of questioning that produces an interesting answer. It is clear that at least a few of the delegates—the more easterly ones—generally believe that they are related to the northern Aboriginal peoples of Alaska, Canada, and Greenland. They call them their "cousins." It becomes obvious that the traditional religious beliefs, economic activities, habitations, clothing, crafts, and music of Russia's Aboriginal peoples are surprisingly familiar. They remind us of what we have seen and heard in other circumpolar countries.

From Noril'sk we move on to central **Siberia**. We stop for two days in a town called Mirnyy to visit a diamond mine. Mirnyy has a population of about 50 000. Since Mirnyy is

RUSSIA'S NORTHERN ABORIGINAL PEOPLES

A small number of Sami live near Murmansk in the west and a small number of Inuit live on the east coast where the Asian continent meets the Bering Sea. Between these two groups, there are many other groups, often larger, spread across the continent north of 60°. These include the Komi, the Nentsy (Samoyeds), the Nganasany, the Sel'kupy, the Khanty (Ostyaks), the Evenki, the Dolgany, the Yakuti (or Sakha people), the Eveny, and the Chukchi. Other groups, such as the Mansi, the Koryaki, and the Yukagiry, live in the interior.

Each group occupies its own traditional territory. Each has its own language and customs. Each has a distinct physical appearance. In spite of their differences, however, these northern aboriginal peoples share important elements of a common lifestyle. This common lifestyle is rooted in the land. It involves to some extent reliance on the resources of the land for survival: land or sea mammals, fish, fur-bearing animals, or reindeer herds.



The Yakuti are one of many aboriginal groups in Russia.

more than 6° south of Noril'sk, and it is now early February, we immediately notice that the days are a little longer. But longer doesn't mean warmer. In central Siberia it is even colder than it was along the north coast. It is -41°C the day we arrive.

The diamond mine is close to town. The mine is the main reason for the town's existence and employs most of the people here. The mine is an open pit, about one kilometre in diameter and very deep. A spiral road runs around the edge of the pit down into the mine. We are told that the road is five kilometres long. A parade of huge ore trucks travel on this road, bringing heavy loads of host rock to the mills from the bottom of the pit. The ore is crushed at one of the mills, and diamonds are extracted from it. This mine looks a lot like the pictures we saw of the diamond mines in the NWT.

The mills we visit present the same picture of heavy industry we saw at Noril'sk. There are large buildings, heavy equipment, and massive machinery. Workers in coveralls are busy everywhere: welding, repairing vehicles, operating complex control panels. We are told that the mine does not cause much environmental damage. The biggest effects are the huge pit itself, which is like a blemish on the earth, and the massive waste heaps of crushed rock.

Mr. Gagarin says that the mining industry is very important. Russia is richer in minerals than any other nation. Nearly every known mineral can be found somewhere in the country. In addition to other minerals, Russia produces large amounts of coal, copper, diamond, gold, iron, nickel, and tin. It also has plenty of oil and natural gas which are transported to refineries by pipeline. "Are underground pipelines safe?" Niels asks. Mr. Gagarin replies that in 1994 a serious spill

occurred near Usink in the Komi Republic. The long-term effects are still being studied.

From Mirnyy we fly eastward to Yakutsk, a city on the Lena River. Once again the temperature is colder. It is -44°C at mid-day in Yakutsk. Our breath freezes with every word we speak. We all have red noses. In fact, we are now only a few hundred kilometres away from the town of Verkhoyansk, Siberia where the world's greatest variations in temperature have been recorded. Its record summer high is +36.7°C, and its record winter low is -67.8°C. That is a range of 104.5°C! With its average January temperature of -49°C, Verkhoyansk is one of the coldest permanently inhabited places in the world. In spite of feeling quite cold, we are all very thankful that we are in Yakutsk and not in Verkhoyansk.



This is a quarry of a major diamond deposit.

PHOTO

When this text book was first printed, Diamonds had not yet been discovered in the NWT. Discuss in what ways this new industry has changed the NWT and your community.

Yakutsk is the capital of the Sakha Republic and has more than 200 000 people. Its population is about 50 per cent Aboriginal and 50 per cent Slavic Russian. The Sakha people, or the Yakuti as they are sometimes called by others, is the largest Aboriginal group. Many reindeer-herding Evenki also live in the region, as well as a small number of Yukagiry.

Yakutsk is an interesting city. It is located on a fairly flat and well-treed plain. There is a core of modern office buildings in the city's downtown area. We see many concrete apartment buildings here just as we have seen in other Russian cities. But there are also surrounding suburbs where detached houses are made of squared logs in the traditional Russian style. Most of these houses are grey, the colour of aging wood. Some have been



Almost every known mineral is found in Russia. This rock contains gold.

treated with a stain and are dark in colour. They look very warm and comfortable.



The minerals in Russia are used to produce industrial commodities.



In Yakutsk, there are modern, concrete apartment buildings and some traditional log houses.

We really enjoy our visit to Yakutsk. We visit the Institute of Minority Peoples where Professor Malikov once taught. People there still remember him fondly. We also visit the Permafrost Institute, where scientists study the permafrost that underlies much of the circumpolar land surface. Permafrost is studied because it has a big impact on such things as plant life and construction techniques.

In the courtyard in front of the Permafrost Institute there is a big statue of a brown woolly mammoth with huge tusks and its trunk curled in the air. Looking like an elephant, it seems out of place. Mr. Gagarin tells us that woolly mammoths once roamed northern areas. They are now extinct. The carcasses of some woolly mammoths have been found near here locked in permafrost.

One day we board a bus for a 20 minute drive outside of Yakutsk to what the Russians call “Canadian Village.” This village was designed and built by architectural, engineering, and construction firms from Yellowknife, Canada. It is quite different from the typical Russian village. We have lunch with some music students who live there. They seem very happy with their new living quarters.

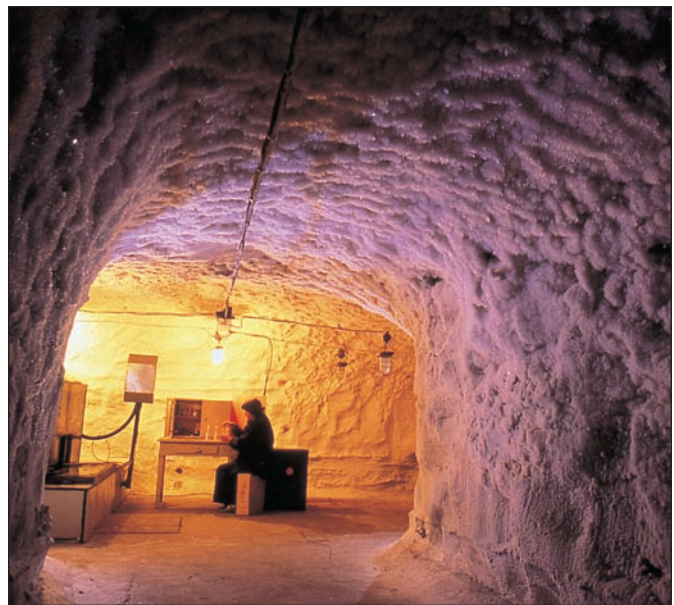
To end our stay in Yakutsk, the local government hosts us at a dinner and then takes us to the theatre. At dinner we have slivers of raw, frozen fish that we eat with salt and mustard,

braised horse ribs, roast hare, potatoes, and cucumbers. On the side there is heavy, dark bread, a staple food in Russia. The adults wash everything down with vodka. We have sugared tea.

At the end of the meal there are speeches, toasts, and entertainment. Two men with rich, deep voices sing Russian folk songs. We are very proud when Alfrida responds by singing a Swedish folk song. Her beautiful, clear voice is a match for our talented hosts. They applaud very loudly.

When the banquet is over and we are preparing to go, I notice that Ms Bohnet has a glow in her eyes and a happy smile. A handsome young Russian is paying a lot of attention to her.

Putting on our coats, I am reminded again of what seems to be the single most obvious feature about Russian society. Everyone wears a big fur hat—men, women, and children. I decide



Scientists of the Institute of Permafrost Studies work in an underground laboratory, surrounded by thick, icy permafrost. The Institute is the Siberian branch of the Russian Academy of Sciences.

SIBERIA'S "CANADIAN VILLAGE"

Construction materials such as lumber, insulation, windows, doors, tools, power plant, vehicles, and mechanical and electrical systems were purchased in Canada and shipped by rail to Vancouver. They were loaded onto a Russian ship in August, 1992. This ship, owned by the Murmansk Shipping Company, sailed through the Bering Strait to Tiksi at the mouth of the Lena River. There the materials were transferred to barges and shipped up the Lena River to Yakutsk, arriving in October.

The village houses about 150 people. It has 22 three-bedroom homes and 15 four-bedroom homes. These homes are built around a central plaza that contains an administration centre, a four-classroom school, health centre, general store, fire station, garage for vehicle maintenance, cafeteria, and an emergency power station.

Village water comes from a deep well. It is carried to the treatment plant by a **utilidor**. The village also has a sewage treatment plant.

The buildings are all made of the same materials, and built with the same construction techniques as are commonly used in northern Canada. Their design is basically the same, but certain Russian architectural elements have been fitted into the design.



A Canadian company designed this village so that it would be suitable for the climate of the Sakha region in Russia.

then and there that if I can afford it, I will bring one home for my father.

The theatre we visit is a magnificent building with about 500 seats. The play is in the Sakha language. Interpreters whisper to us once in a while; but the play is so dramatic that we generally understand the story from the actors' movements, looks, and gestures.

It is an historical play that shows the meeting of the Sakha people with Slavic Russians long ago. There is a shaman in the play wearing a fringed buckskin costume. He performs magic and

is shown as a defender of the Sakha culture. He carries a large drum very much like the Inuit drum we saw in Pangnirtung, except that the surface of this one is somewhat curved. The shaman taps his mallet on opposite edges of the drum with alternating strokes, and sways as he sings.

As we leave the theatre, very impressed by the play, we tease Ms Bohnet, telling her that she should go straight home. She blushes and says, "Of course!" In good English, her Russian escort tells us not to worry. He says he will make sure that she is very well looked after.

The next day, we pack our bags, say our many sad goodbyes, and prepare to leave Russia. We fly to Magadan first, on the eastern coast of the continent. There we change planes for Anchorage, Alaska.

On the plane, Alfrida and I work together on our notes. We agree that one of the most

SEARCH

Identify mines operating in your region. Chart them according to location, type, size (employment, production tonnage, economic value, environmental impact), and according to the destination of the product. Which mine has the greatest impact on your region?

DISCUSS

In what ways do you use the internet? How has the internet changed the way people work and communicate in the north? Who benefits and who losses out when a new form of technology, such as the internet, is introduced to the circumpolar world?

SEARCH

Identify and describe one or more northern technologies that have been transported from your country to other countries. Identify and describe technologies that have been transported into your country. Design an invention that would benefit people in the circumpolar world.

overwhelming things about Russia is its size. We thought Canada was big when we flew across its northland, but Russia is much bigger.

We estimate that the distance from Murmansk to Magadan is about 5000 kilometres. Counting up the number of hours by which we have adjusted our watches since Murmansk, we realize that we have travelled through nine different time zones in Russia! It is 6:00 AM back in Murmansk, while at the airport in Magadan it is 2:00 PM. That certainly gives us a clear idea of Russia's size!



The shaman in the play wore a costume similar to the costume of this Taimyr shaman from the Krasnoyarsk Territory of Russia.



We travelled through nine time zones as we crossed Russia.

WEB LINKS

eLibrary

<http://elibrary.bigchalk.com/libweb/canada/do/login>

NWT access - Username: govont0201 - Password: elca

CultureGrams

Address: <http://online.culturegrams.com/>

NWT access - Username: govnorthwest - Password: welcome

Wikipedia – Russia

<http://en.wikipedia.org/wiki/Russia>

University of Texas Library – “Russia”

<http://www.lib.utexas.edu/maps/commonwealth.html>

Alaska

CHAPTER 10

Flying over the Bering Sea in the evening darkness, we cross the **International Date Line**. Our pilot announces that we should start thinking of this as the evening of February 17. All day we've been calling this day February 18. "When we get to Anchorage, you can change your watches to take account of the four time zones we will have passed since leaving Magadan," she says.

Anchorage is a busy airport. It handles transpolar flights from the continental USA to Japan and Russia. It is also a year-round tourist destination. Rachel Aiken meets us at the airport. She welcomes us to the United States of America. She reminds us that Alaska is one of fifty states, and the only American territory in the circumpolar region. The capital of the USA is Washington, DC. It is located far away near the east coast of the continent. We will certainly not travel there. The capital of Alaska is Juneau. It is located in the southeastern part of the state in what is called the Panhandle. Unfortunately, Ms Aiken says, we will not have time to visit Juneau either.

I am billeted with Faye and Roy Jackson and their daughter Clara. This time Niels is my partner. As soon as he discovers we're partners, he asks me to change places with Mary. I don't want to keep them apart, but I really figure we should stay where we

are put. I can see the organizers' purpose in billeting us with different members of our group in each country. I say no. Niels gets mad at me.

The following day the Jacksons drive us around Anchorage. By this time, Niels



The busy airport at Anchorage handles transpolar flights from the continental USA to Japan and Russia.

is talking to me again. We both agree it's nice to be out of the Siberian deep-freeze! It's -3°C as we tour the city. Clara tells us that the temperature only dropped to about -7°C last night.



We have crossed the Bering Strait and now we are in Anchorage, Alaska. I wonder what the temperatures are like here.



A L A S K A



BASIC FACTS (note: statistics are for all of the United States, including Alaska)

Formal name: United States of America

Common name: US or USA

Area: total: 9,826,630 sq km (fourth largest country in the world)

Area north of 60° latitude: 11% of total (est.)

Population: 303,824,646 (July 2008 est.)

Life expectancy: males, 75; females, 81 (2008)

Ethnic mix: mainly European in origin (81.7%); Aboriginal population (1%); African-American (12.9%); small minorities of people from many countries

Capital city: Washington, DC

Population of capital: 588 292 (2007)

Other major population centres: Boston, Chicago, Dallas, Los Angeles, Miami, New York

Government: a republic, a representative democracy and a federal state; it has a presidential style of government, with the powers of government strictly divided into three branches: the executive, legislative, and judicial; the legislature, called Congress, is comprised of two elected houses: the House of Representatives and the Senate

Currency:

American dollar



You can see Mt. McKinley at Denali National Park in Alaska. At 6198 metres, it is the highest peak in all of North America.

Natural Resources:

coal, copper, lead, molybdenum, phosphates, uranium, bauxite, gold, iron, mercury, nickel, potash, silver, tungsten, zinc, petroleum, natural gas, timber.

Land use: croplands, meadows, pastures 45%; forests and woodlands 29%; other 26%

Exports: \$1.14 trillion (2007) - agricultural products (soybeans, fruit, corn) 9.2%, industrial supplies (organic chemicals) 26.8%, capital goods (transistors, aircraft, motor vehicle parts, computers, telecommunications equipment) 49.0%, consumer goods (automobiles, medicines) 15.0% (2003); **main destinations:** Europe 4.4%, Canada 22%, Japan 6%, China 5%, Mexico 13%.

Imports: \$1.987 trillion (2007) —agricultural products 4.9%, industrial supplies 32.9% (crude oil 8.2%), capital goods 30.4% (computers,

telecommunications equipment, motor vehicle parts, office machines, electric power machinery), consumer goods 31.8% (automobiles, clothing, medicines, furniture, toys) (2003); **main sources:** Canada, 16%, China 15.9%, Japan 7.9%, Mexico 10%, Germany 5%.

THUMBNAIL HISTORY

Alaska was originally inhabited by Aboriginal peoples. Estimates of their arrival range from 30 000 to 10 000 years ago.

A Danish navigator, Vitus Bering, exploring for the Russian government, visited Alaska in the eighteenth century and claimed the area for Russia. Russians soon established control over Alaska and held it until 1867. During this time many Aleuts were converted to the Russian Orthodox Church. Some still follow that religion.

Eventually, British and American fur traders became interested in Alaska. The Russians feared they might lose the area to Britain in a war. However, they were on good terms with the United States of America. In 1867, they sold Alaska to the USA for \$7.2 million. American Secretary of State William Seward negotiated the deal. Many Americans thought Alaska was a barren wilderness, so they called the territory “Seward’s Folly.” The purchase has since proved Seward’s good judgment.

Americans did not do much in Alaska at first, but the gold rush of 1899 spurred government interest and economic development. Juneau was named the capital in 1900. Alaska remained a territory of the USA until 1959 when it was finally admitted to the union as the 49th state. Alaskans commonly refer to all the other states on mainland America as “the lower 48.” The 50th state is Hawaii.



Barrow, Alaska is the northernmost city in the United States..

That’s quite different from Yakutsk, even though the two cities are approximately the same distance from the North Pole. “The difference in climate is mainly because Anchorage is close to the sea and has warm winds,” Mr. Jackson explains.

We discover that Anchorage is suitably named. It is built around a harbour on Cook Inlet. When Captain James Cook anchored here in 1778, he recognized the site as a good place for a settlement. A community was finally established in 1915. Today nearly 300,000 people live in Anchorage, about 30,000 of whom are Aboriginal.

Mrs. Jackson says that a variety of Aboriginal peoples live in Alaska, totalling about 95 000 out of a total population of nearly 700,000 Alaskans. Athapaskan-speaking First Peoples live in the interior. Tlingit, Haida, and Tsimshian Indians live in the southeast, and Aleuts live on the Peninsula and the Aleutian Islands. Inuit (Yupik and Sugpiaq) live on the west coast, and Inuit (Inupiat) live along the north coast. The Jacksons are descended from the Yupik.

The Jacksons also tell us that Alaska is in a geologically active zone. Like Iceland, the Alaska Peninsula and the Aleutian Islands are home to active volcanoes. Anchorage was hit by a powerful earthquake in 1964. Nine people were killed and hundreds injured. Thirty blocks of houses and commercial buildings were destroyed. The floor of Cook Inlet dropped. Surprisingly, this improved the harbour.

We spend only one pleasant day with the Jacksons, but we will return in two weeks to stay again. Now, however, it is time to head for Nome. Flying northwest, we see famous Mt. McKinley in the distance. Its Athapaskan name is *Denali*, meaning “the high one.” At 6198 metres, it is the highest peak in all of North America. It is awesome—majestic, powerful, and forbidding. I sure wouldn’t want to have to climb it!

Eventually, we fly over the historic Yukon River and land at Nome. Inuit have lived in the area around Nome for centuries. A permanent community was first established here after gold was discovered in 1899. That discovery began a gold rush, like the one at Dawson in the Yukon in 1898. The population of Nome swelled

to 10 000. Gold is still mined in the region, by a method known as dredging. The population has long since grown smaller. It is now about 3500, a little over half of whom are Inuit.

The people of Nome and the surrounding region continue to follow some traditional pursuits. The men like to go to sea when the water opens in April to hunt walruses, seals, and beluga whales. Women still sew traditionally styled garments, using some modern materials. In the village, people scurry around in warm, locally made parkas, trimmed with beautiful ruffs of white fox or wolverine fur. Expert crafts are sold in the community: jewelry, fine needlework, and carvings of ivory, bone, and antler.

In addition to the traditional activity, the village is as modern as many others we have seen in the north. There are plenty of snowmobiles and other motorized vehicles around. Adults work in garages, shops, and offices. They watch television in the evenings. They keep up to date with world news. Their children wear tee shirts, blue jeans, and running shoes to school. The kids watch television too, play video games, and do



On March 27, 1964, Alaska was hit by an earthquake. This photograph shows a street in Anchorage shortly after the quake.

all the same things that the kids in our group do to become educated and to entertain ourselves.

We have a great time in Nome. We enjoy meeting the people, and we enjoy the many sports and cultural activities that are planned for us by the Bering Straits Native Corporation—this includes a chance to drive a dog team!

On our last day in Nome everyone in our group is thrilled to meet Jimmy Nevak's parents. They live in Moses Point, about 100 kilometres away. They have made a special trip here to visit him. They bring some country food for Jimmy and enough *muktuk* for all of us to chew on. That is a special treat!

On February 26 we head north for Barrow, on the shore of the Arctic Ocean. There we run into colder temperatures and shorter days once again. It is further north than any other community in the USA. It is the largest of eight communities along the shore of Alaska's North Slope. There are nearly 7500 permanent residents in these North Slope communities. Approximately 3500 of them live in Barrow. About 70 per cent of all North Slope residents are Inupiat.

The Inupiat, meaning "the real people," have traditionally been whale hunters. They go to sea to hunt as soon as there are open leads in the ice each spring. One bowhead whale provides enough meat to feed a small community

BERINGIA

The Bering Strait is a narrow body of water separating two continents, Asia and North America. The sea in this area is very shallow, less than 50 metres deep. Some scientists think this sea floor was above the water about 30 000 years ago, and that a land bridge connected Asia with North America. They call this former land bridge Beringia. They believe that Aboriginal peoples migrated from Asia to new homes in North and South America using this land bridge. Pressures on the earth's crust, they believe, later caused Beringia to sink beneath the waves. See Chapter 16 for a map of Beringia.

for weeks. At one time the bowhead was valued for its oil as well as its meat. Now people use modern fuels, but the whale fat is still valued for cooking and for baiting fox traps. They also hunt seal, walrus, caribou, and birds.

Today there is an international ban on commercial whaling because many species of whale are endangered. The exception is for Aboriginal people who rely on country food. The law permits them to hunt whales for family use, but not for sale. This is called subsistence whaling. The Inupiat are allowed to sell crafts, such as bone carvings, that are produced from parts of the whales they kill for food. A government commission sets a limit on the number of whales the Inupiat may take each year. This is much like the community quota system that governs the harvest of polar bears in Canada.

Life for the Inupiat changed dramatically with the discovery of oil at Prudhoe Bay in the late 1960s. When this large oil field was developed in the 1970s, considerable wealth came to the North Slope. The Arctic Slope Regional Corporation and the village corporations that were set up under the Alaska land claim settlement share this prosperity. The regional corporation has investments in land, natural resources, transportation, communications systems, and construction activities. The village corporations have developed businesses and they are an important employer of Inupiat.

In addition to these economic developments, the North Slope Borough was established in 1972. This government enables the Inupiat to have a large measure of control over their own lives.



Dog teams pulling sleds are a traditional form of transportation in Alaska and in Canada. In Alaska, dog teams are used mostly in competitions, like the Iditarod.

THE ALASKA NATIVE CLAIMS SETTLEMENT ACT

Life has changed for all aboriginal peoples in Alaska since 1971 when the Alaska Native Claims Settlement Act was passed. Under the terms of that Act, land was assigned and money was distributed to aboriginal groups by the Government of the USA. This was compensation for the loss of lands historically occupied by them, and for giving up any further claim to land in Alaska. Alaskan Natives received \$962.5 million and ownership of 17 600 000 hectares of land. Thirteen regional corporations, and more than two hundred community corporations, were set up to look after this land and money. Some of the corporations have been more successful than others at improving the lives of their members.



This Inupiat whale-hunting crew is preparing to go out onto the water in their umiaks.

In Barrow, we see many signs of the Borough's prosperity. They have well equipped schools, a modern recreation centre, municipal buildings, and equipment. This prosperity is also evident when we visit their television studio. The studio produces cultural and informational programs for the people of the North Slope. It is the centre of a conference network that enables regional meetings to be held by video. It also enables education classes to be broadcast to all North Slope communities.

In spite of all these changes, we find that tradition is still important to the Inupiat. We are told, for example, that they have a winter cultural celebration called *Kivgiq*. The community also comes together for celebration and sharing when a bowhead whale is harvested. This celebration, called *Nalukataq*, shows that old Inupiat traditions live side by side with modern technology. Ms Aiken tells us that people in the region sometimes like to say "the North Slope is a place where the

wisdom of the ages meets the promise of the future." We can easily see why they say that.

We planned to visit the oil field at Prudhoe Bay where we could see the beginning of the Trans-Alaska Pipeline. Built in the late 1970s, it delivers oil to Valdez on the south coast. But a bitter storm sets in. Strong winds and blinding snow pin us down in Barrow.

We manage to spend part of our time learning about the pipeline anyway. By using the videoconference facility, we are connected to a pipeline official in Fairbanks. He speaks to us from a screen. We ask questions and, he shows us charts, maps, and pictures, so things work out very well.

When the two-day storm ends, we head back to Anchorage. We make a brief stop for refuelling in Fairbanks. Just as we are taking off from Fairbanks, we catch a glimpse of the north end of the famous Alaska Highway. Ms Bohnet tells us the highway was built very quickly through difficult



This is an oil drilling rig at Prudhoe Bay. A large oil field was discovered here in the late 1960s.

terrain during World War II. It was built because Japanese soldiers occupied Attu and Kiska in the Aleutian Islands in 1942. Americans and Canadians feared that the Japanese were preparing to invade North America. The highway, which links Fairbanks with Edmonton, Alberta, would ensure that supplies

THE NORTH SLOPE BOROUGH

The Borough is a government for the most northerly region of Alaska. It handles matters such as education, health, social services, housing, municipal services, culture, and wildlife resource management.

The Borough has some jurisdiction over the oil fields of Prudhoe Bay. It receives a high level of tax revenue from property taxes on oil field equipment. With this money the Borough is able to deliver high-quality services to its citizens. It is the region's single biggest employer. When teachers are included in the figure, the Borough employs nearly 60 per cent of the region's total work force.

and war materials could reach the frontier quickly. In 1943, the Japanese were forced off the islands. The invasion never came.

Ms Aiken adds that the construction of the highway had a major impact on groups of First Peoples along the route. Animals that hunters relied upon for food became scarce; lifestyles were disrupted by the presence of soldiers and civilian workers.

The Jacksons are waiting for Niels and I at the Anchorage airport. We spend a couple of wonderful days with them touring in and around Anchorage.

Then our group gets together again for a trip to Valdez to see where the pipeline terminates and where



This is the courthouse in Barrow. This community also has well equipped schools and a modern recreation centre.

the oil is loaded onto ocean-going tankers.

Our short flight takes us across Columbia Glacier. It is one of many glaciers on the south coast of Alaska. Its blue-white ice looks forbiddingly cold as it slowly grinds and carves its wintry way down to the sea. It reminds me of the icecap in Greenland.

In Valdez, we examine the pipeline terminal and watch a tanker being loaded. And, of course, we learn about the major oil spill when the *Exxon Valdez* ran aground in 1989.



The Trans-Alaska Pipeline extends 1300 kilometres, from Prudhoe Bay to Valdez. It now carries an average of 720,000 barrels of oil a day.



Pillars hold up sections of the Trans-Alaska Pipeline so that it will not be affected by permafrost.

THE TRANS-ALASKA PIPELINE

Pipeline construction began in 1974. The Trans-Alaska Pipeline is 1 300 km long, from Prudhoe Bay to Valdez, where there is a tanker terminal. Each barrel takes about three days to make the journey. At peak production in the late 1980s, over 2,000,000 barrels of oil were pumped through the pipeline per day. The oil fields in Alaska are now declining. Most of the oil has been found and pumped out of the ground. By 2008 the pipeline was carrying an average of 720, 000 barrels of oil a day.

The line crosses difficult territory between Prudhoe Bay and Valdez, including the North Slope tundra where the land is underlain by continuous permafrost. Permafrost causes problems for engineers. If the soil above permafrost is disturbed, or if heavy structures are built on permafrost, the frost will begin to melt. If the frost melts, the foundation under a structure will shift and the structure might collapse. If a pipeline were to be buried in permafrost, the melting would cause the line to shift position and likely cause the line to rupture and spill.

To avoid these problems, the Trans-Alaska Pipeline was raised on pillars in the permafrost zone. Where the pillars entered the ground, refrigeration units were put in place to keep the ground frozen. About half the line is built on these above-ground pillars. The rest, outside the permafrost zone, is buried.

Engineers faced other construction problems, too. The line had to cross mountains, skirt around glaciers, and cross more than 800 rivers and streams.

The engineering challenges were for the most part resolved, and the pipeline was completed in 1997. By 2008 over 15 billion barrels of oil had been pumped through the line to Valdez and hauled away by ocean-going tankers.

Today we see few signs of that terrible event, but we must not forget that it happened. Environmental and financial costs were very high.

The first Saturday in March we are back in Anchorage. This is the time of the annual Fur Rendezvous, a grand version of a late winter carnival. This type of carnival is held in many northern communities when the days become a little longer and temperatures begin to rise.

We all decide we will have a great time at the Rendezvous. This is the last big event we will enjoy together. Soon we will be going our separate ways. We buy ourselves treats and travel around the city getting involved in as much as we can. We watch some participants having fun running a snowshoe race. Then we have a race among ourselves. Reino wins it hands down. We listen to some good folk singers and storytellers recalling Alaska's early days. We cheer dogs entered in a weight-pulling contest. They are strong and impressive and seem eager to show off their strength. But the most exciting event is the start of the *Iditarod*.

The Iditarod is an international dog sled race commemorating the time in history when dog teams delivered mail and medicines to outlying communities. It is the world's longest dog sled race. Teams and mushers race more than 1600 kilometres from Anchorage to Nome. They travel over difficult terrain through harsh weather conditions. Participants take anywhere from 12 to

32 days to complete the race, depending upon storms, temperatures, and the amount and quality of snow. I count about 50 mushers at the starting line. There are hundreds of howling dogs straining and anxious to go. It is all pretty exciting stuff. But the most exciting moment comes when we are introduced to Susan Butcher. She was the first woman ever to win the Iditarod and she has won it four times! We all scramble to find bits of paper and ask for her autograph. Not everyone is lucky though. After signing five or six, she is suddenly called away for the start of the race.

Once the last team has disappeared, an eerie quietness settles in. And a painful sadness soon follows it. We know that our time together has nearly ended. Some of us



Built during World War II to carry war supplies and soldiers, the Alaska Highway now carries tourists and truckloads of merchandise.

feel wetness welling up in our eyes, and try not to show it. Others just let the tears roll down like raindrops on a windowpane. We quietly hug one another, then return to our billets.

The following day Ms Aiken and all the billeting families come to see us off at the airport. Jimmy is there too, but he will not be travelling any further with us. As I look at the faces of all those we are leaving behind, I remember the many others we have parted from in our long

journey. It suddenly strikes me very clearly that there are kind and generous people, interesting and good-humoured people, intelligent, and well-meaning people of every race and hue the world around. I must never forget that.



When the Exxon Valdez ran aground in 1989, its oil spilled into the ocean. Sixteen hundred kilometres of shoreline was damaged by the 270 000 barrels of oil that flowed from the supertanker.



The Fur Rendezvous is a winter carnival in Anchorage. These sculptures are made of ice.

The Exxon Valdez

On March 24, 1989 a supertanker, the *Exxon Valdez*, filled its tanks with oil and headed out into Prince William Sound. The ship got off its proper route and ran aground. Its tanks broke open and oil spilled into the ocean.

Seven days after the accident, the oil slick extended nearly 145 kilometres from the ship. In the end, 270 000 barrels of oil polluted the ocean and 1600 kilometres of shoreline were damaged. At least 1000 sea otters and 30 000 birds died from the oil. Eagles, seals, gray whales, and fish were damaged and destroyed as well. The commercial fishing industry is very important to Alaska. Fishers lost both work and income.

At the peak period of damage, 10 000 people used more than 1300 vessels and nearly 100 aircraft on cleanup operations. More than \$3 billion was spent on the cleanup.

When our plane lands at Whitehorse to refuel, Mary stands in the aisle and speaks very dramatically to Ms Bohnet. “May I get off here, Ms Bohnet? Ple-e-ease!” She is joking, of course.. Everyone laughs when Ms Bohnet calls her bluff and says to the surprised flight attendant, “Could we arrange to put Mary Dillon off here? Ple-e-ease!”

Finally we reach Yellowknife again. When we touch the runway, our circumpolar journey is complete. We’ll disperse from here, each of us flying to our own homes. I’m anxious to see my folks again—even my bothersome little brother!

We’ll carry home all our notes, photographs, videos, and memories. Then we’ll set to work on our assigned reports, trying to express our new understanding of the North. Without any doubt, we’ll all stop what we’re doing sometimes and lose ourselves in the vivid memories of this unique and wonderful trip. And we’ll miss one another too— Ms Bohnet included. I’m sure of that.



Here's the starting point of the Iditarod race in Anchorage.



The Iditarod ends in front of the city hall in Nome.

SEARCH

Compare and contrast any two communities in the circumpolar world that lie along the same latitude. Consider population, climate, topography, resources, and industry. If you had to relocate to one of these communities, which would you choose? Explain your answer.

ACT

Decide upon some measure, however small, that would allow you to play a part in fighting water, land, or air pollution.

SEARCH

Trace the history and development of whaling in northern waters. Learn about the International Whaling Commission (IWC), its purpose, authority, and decisions. Research the extent of whaling practices in the world today. Why is this issue controversial? Using your research, take a position on whether or not whaling should be further limited.

PHOTO

Photo (Exxon Valdez) pg 110 When you look at this photo, how do you feel? How does our attitude toward the environment and economic progress shape our reaction to environmental disasters such as this oil spill?



We're back at Yellowknife. We say our goodbyes and head back to our homes.

WEB RESOURCES

eLibrary

<http://elibrary.bigchalk.com/libweb/canada/do/login>

NWT access - Username: govont0201 Password: elca

CultureGrams

Address: <http://online.culturegrams.com/>

NWT access - Username: govnorthwest Password: welcome

Search.com Reference– United States

http://www.search.com/reference/United_States

Wikipedia - Alaska

<http://en.wikipedia.org/wiki/Alaska>

Travel Alaska

<http://www.travelalaska.com/>

Alaska Kids

<http://www.state.ak.us/local/kids/>

Reports from the



Top of the World

Factors That Control the Northern Climate

CHAPTER 11

April 20

I received the first report today from Larisa. Her note reminds me of the interesting time we had at the farm in Iceland. She says she is trying to get a copy of Njal's Saga so she can finish reading it. The librarian doesn't offer her much hope, but I know she will keep trying. That's the way Larisa is. Here is her report.

Geographic Factors that Control Northern Circumpolar Climate

Plants, animals, clothing, home design, construction techniques, and leisure activities are all influenced by climate. Climate is determined by geographic elements that are called "climatic controls." These controls include elevation (distance above sea level), land forms, distribution of land and water, prevailing winds, and ocean currents. Latitude, and the tilt of the earth's axis combined with the yearly revolution of the earth around the sun, have a particularly important impact.

The Tilt of the Earth

Earth's **rotational axis** does not sit at right angles to the plane that the earth forms with the sun. Rather, it is tilted at an angle of $23\frac{1}{2}^{\circ}$ from the vertical.

We know this because of observations made at various locations on the earth's surface.



Climate affects what kind of clothing people wear. Many First Peoples found that animal fur provided the best protection against the northern climate.

An important observation has been made with respect to the perpendicular rays of the sun, for example. Perpendicular rays are those that shine down on an observer from directly overhead, at an angle of 90° . Where there are perpendicular rays, the only shadows are those underfoot.

Perpendicular rays of the sun are observed at locations between $23\frac{1}{2}^\circ\text{N}$ and $23\frac{1}{2}^\circ\text{S}$. We call imaginary lines at these two boundaries the Tropic of Cancer and the Tropic of Capricorn respectively. The sun's rays never strike the earth at a 90° angle further north than the Tropic of Cancer nor further south than the Tropic of Capricorn.

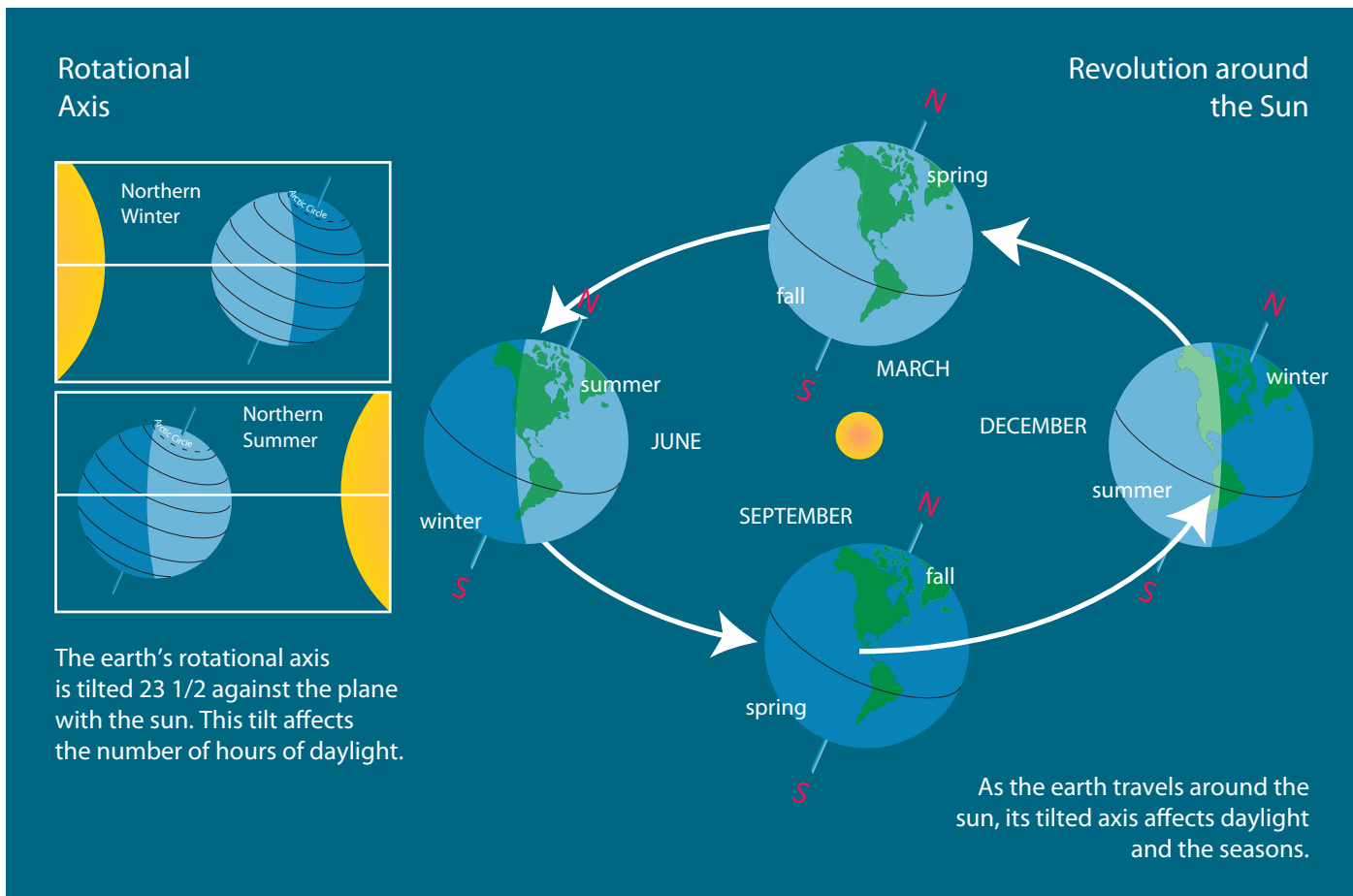
We confirm the conclusion that the earth's rotational axis is tilted $23\frac{1}{2}^\circ$ against the plane with the sun by making another observation. There are sometimes 24 hours of daylight and sometimes 24 hours of darkness at locations that are within $23\frac{1}{2}^\circ$ from the North Pole (90°N) and the South Pole (90°S). We imagine lines drawn at $66\frac{1}{2}^\circ\text{N}$ (which is $23\frac{1}{2}^\circ$ from the North Pole) and at $66\frac{1}{2}^\circ\text{S}$ (which is $23\frac{1}{2}^\circ$ from the South Pole).

These imaginary boundary lines are called the Arctic Circle and the Antarctic Circle respectively.

The Revolution of the Earth around the Sun

Earth makes one complete revolution around the sun approximately every 365 $\frac{1}{4}$ days. During the journey, the angle of the earth's rotational axis remains constant at $23\frac{1}{2}^\circ$. So does the orientation of the North Pole as seen from the point of view of an imaginary observer outside the solar system. That is, the North Pole points toward the sun in June, but it points away from the sun in December.

Two things determine the length of daylight: the tilt of the earth's axis and the yearly revolution of the earth around the sun. In turn, these determine the amount of solar radiation (and the amount of warmth) a community receives throughout the year. Northern circumpolar communities receive long hours of sunlight from May to July, but very little or none from November to January.



The Midnight Sun

Every year along the Arctic Circle there is one day when the sun does not go above the horizon and one day when the sun does not go below the horizon. The number of such days increases as one travels northward from the Arctic Circle. At the North Pole the sun is above the horizon for six months and the sun is below the horizon for six months.

Many people living just south of the Arctic Circle believe that they live “in the land of the midnight sun.” Long periods of summer twilight, clear skies, and the annual introduction of Daylight Saving Time. In reality, only those who live north of the Arctic Circle actually experience twenty- four hours of daylight during the summer.

Latitude

If it were only the number of sunlight hours that determined climate, summers in the northern circumpolar region would be extremely hot. However, the strength, or intensity, of the radiation is even more important. Intensity is determined by the angle at which the sun’s rays strike the earth. This angle is determined by latitude, that is, distance from the equator.

When the sun’s rays strike the earth at or near a 90° angle (as they do near the equator), the earth receives more energy per square metre because of the direct sunlight.

Rays that approach the earth at a shallow or oblique angle, however (as they do in northern latitudes), must pass through more atmosphere to reach the earth’s surface. The additional atmospheric dust and air molecules scatter, absorb, and reflect the sunlight, preventing much of its energy from reaching earth.

Every summer, the people living north of the Arctic Circle experience one day of total daylight. At the North Pole, there are six months of continuous daylight.

In addition to this heat loss, oblique solar rays are spread out more than vertical rays when they hit the earth. This means they deliver less energy per unit area. Less solar energy is absorbed by the earth, and less heat is radiated from the earth. Altogether, this means the sun’s rays are less effective at heating polar regions than at heating equatorial regions.

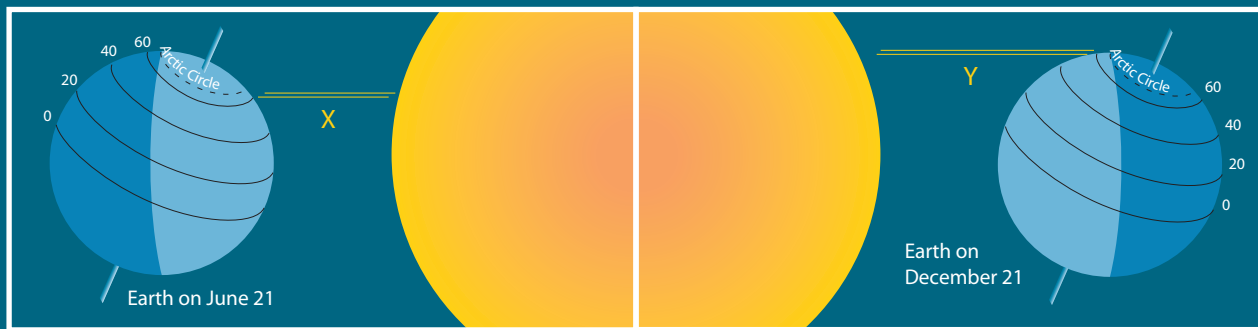
There is a big difference between the heat-effectiveness of the sun’s vertical rays near the Equator and oblique rays near the Arctic Circle. Also, within the polar regions, there is a big difference between the angles of the sun’s rays in summer and in winter. The sun’s rays are much less effective in December than they are in June. One reason is that snow reflects the sun’s rays. An even more important reason is that the sun’s rays



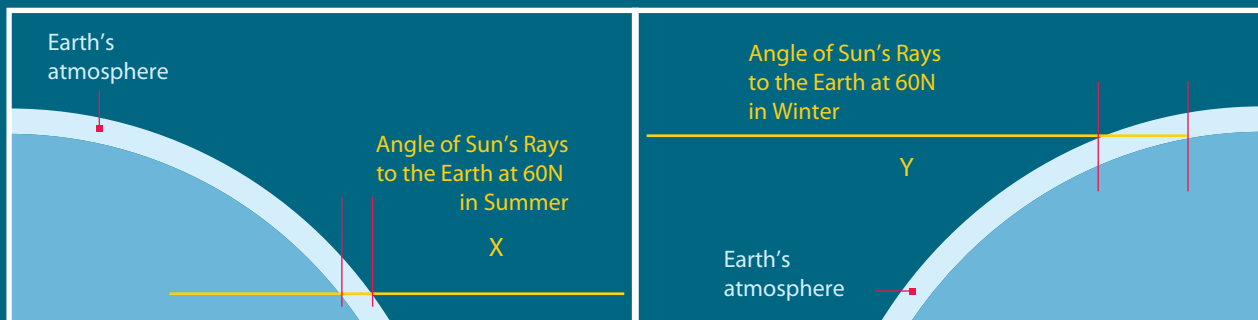
strike the earth at an even greater oblique angle in December than they do in June. For example, at $62\frac{1}{2}^{\circ}\text{N}$, the noon sun on June 21 is 51° above the horizon. On December 21 it is only 4° above the horizon.

In summary, geographic factors account for the reduction of energy from the sun and for the big difference in the amount of sunlight from summer to winter. The shorter period of time of vertical sun rays and the decrease in energy

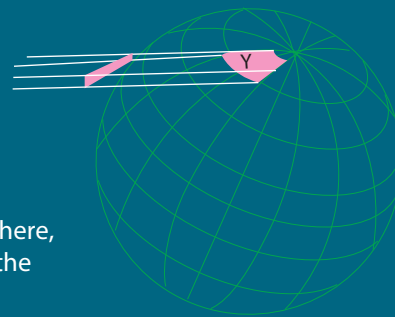
absorbed by the northern landscape account for cool to moderate summers, despite the long hours of sunlight. The sun's oblique rays, combined with few hours of sunlight (or none), accounts for cold winters.



Compare both the length of passage through the atmosphere and the ground coverage of ray X and Y.

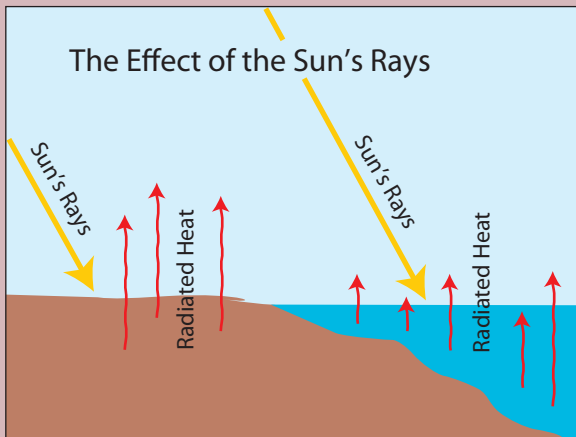


Compare the angle of the sun's rays, the length of passage through the atmosphere, and the ground coverage of the rays in June and December.



SEARCH

Write a letter to a friend in the south describing your favourite season. Include details that explain how climate, latitude, elevation and the tilt of the earth all play a role in creating your favourite season.



When the sun's rays strike the earth's surface, the earth radiates heat back into the atmosphere. Water heats more slowly than land, but it also holds and radiates its heat for a longer time.



SOME GENERAL PRINCIPLES CONCERNING CLIMATIC CONTROLS

Latitude

The closer one travels toward the Poles, the cooler the climate will be.

Elevation

Climates are warmer near sea level and cooler at higher elevations. The temperature decreases an average of 6.4°C for every 1000 metres rise in elevation.

Distribution of Land and Water

Communities bordering large bodies of water have cooler summer and warmer winter temperatures than communities surrounded by land.

Ocean Currents

The impact of ocean currents on climate can be very great. The extent and nature of the impact depends upon whether the current is warm or cold, and whether the winds generally blow onshore or offshore.

Prevailing Winds

The impact of prevailing winds is determined by the direction they blow, and where they have originated. Onshore winds blow from water to land, and moderate the climate. They usually increase precipitation. Offshore winds blow from land to water, and may lessen the moderating influence of the water. Winds that originate over frozen land or ice are extremely cold, of course.

The influence of any one of these factors is always modified by the combined influence of all the other factors.

The impact of prevailing winds depends on whether they blow onshore or offshore. Onshore winds moderate the climate. Offshore winds lessen the moderating influence of the water.

OUTDOOR LAB

Through observation and inquiry, note the time of sunrise and sunset on the middle day of each month through the school year. (In spring, do not switch to Daylight Saving Time.) Calculate the average number of daylight hours each month. Make estimates for the summer holidays.

OUTDOOR LAB

Each day for one month in the winter and one month in the summer, chart the time that the highest temperature of the day is achieved in your community.

OUTDOOR LAB

Carefully protecting your eyes, measure the approximate angle of the sun at noon on the middle day of each month. (In spring, do not switch to Daylight Saving Time.) Diagram your findings on a mural at the end of the school year.

DECIDE

Review the factors that influence climate. Which factors influence climate most in your region? Which factors influence climate least? Give reasons for your choices.

WEB RESOURCES

Global climate change- exploratorium

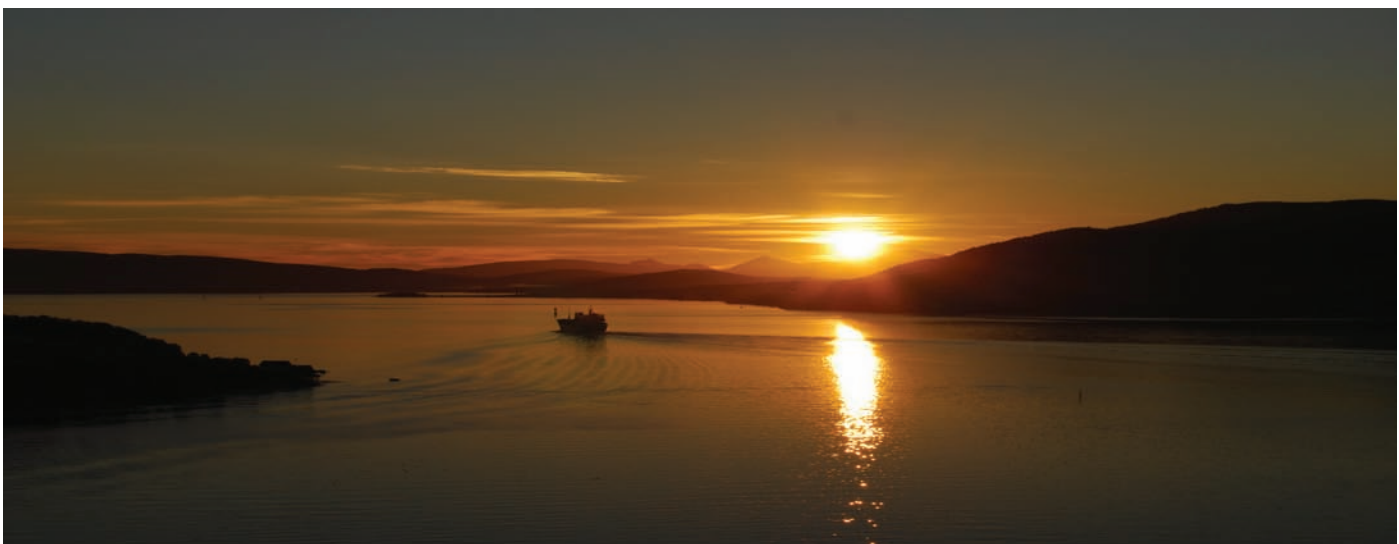
www.exploratorium.edu/climate/index.html

Natural Resources Canada - Climate Change Impacts and Adaptation Programme

http://adaptation.nrcan.gc.ca/index_e.php

The Arctic is an Eco system

www.thearctic.is/PDF/ecosystem.pdf



Midnight sun in Finnsnes, Norway

Climate

CHAPTER 12

April 23

Alfrida's report arrived today. "Remember Moscow, " she says, "Right after we graduate from university, OK?" Well, that's more than OK with me. It's great! Maybe we can meet Larisa, too. Anyway, here's Alfrida's report.

The Climate of the Northern Circumpolar World

Long Ago

Scientists believe that there have been repeated changes in the climate of the northern circumpolar world through hundreds of millions of years. For example, more than 10 000 000 years ago, warm seas covered much of the region. There was no ice on the Arctic Ocean and no icecap on Greenland. Forests grew a few hundred kilometres from the North Pole.

About 2 000 000 years ago, earth's climate cooled. During the past million years temperatures have cooled four times, then warmed again. During each period of cooling, ice formed and spread. These periods are called "ice ages." The last ice age ended about 10 000 years ago when the polar icecaps started melting. Since then the

climate of the northern circumpolar world has been more or less the way we know it today.

The Climate Today

Many factors influence the northern circumpolar climate. The region is very complex. There are two main climates, the arctic climate and the subarctic climate. There are variations within these.



Since the last ice age, the climate of the northern circumpolar world has been the way we know it today.

The 10° summer isotherm is a line drawn on a map through places that have an average

daily temperature of 10°C in the warmest month of the year. This boundary follows the treeline fairly closely, so the treeline is also thought of as a boundary between the Arctic and the Subarctic.

Generally, the arctic region is all territory north of the 10°C summer isotherm. The subarctic region is territory south of that line but still in the northern circumpolar world.

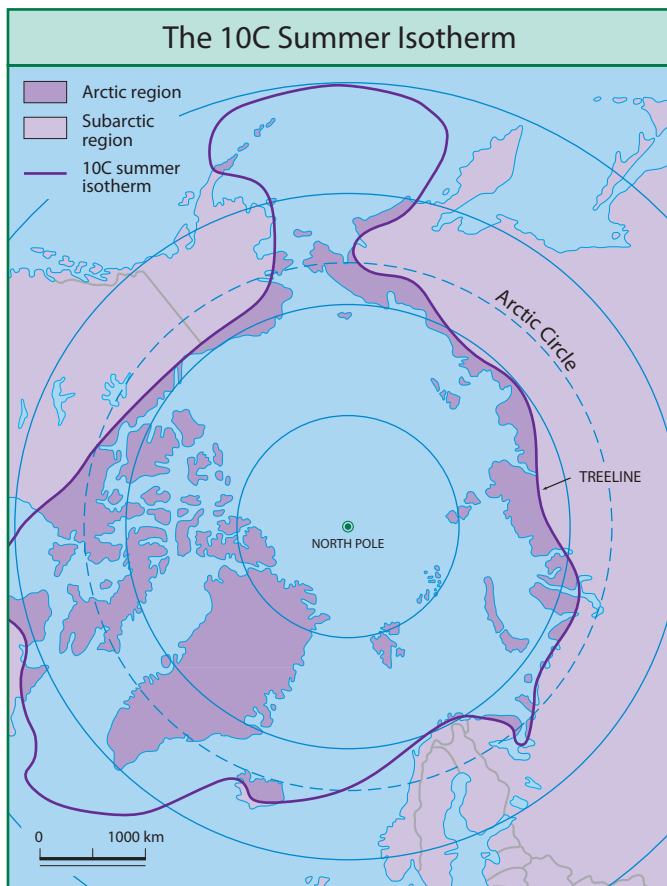
The Arctic Climate

Temperatures

The Arctic has two main seasons: long, cold winters and short, cool summers. Cool to cold temperatures are one general characteristic of the arctic climate.



Summers in the Arctic are short and cool.



The 10°C summer isotherm is a line that shows places that have an average daily temperature of 10°C in the warmest month of the year. North of this isotherm is the arctic region. South of this isotherm is the subarctic region.

Cool to cold temperatures prevail in this region for several reasons. The high latitudes of the region mean that the sun does not shine at all for days, weeks, or months in many locations. When the sun does shine, its rays strike the earth at an oblique angle, so relatively little of the sun's energy is changed to heat, and radiated into the atmosphere. This effect is increased by the fact that many of the sun's rays are reflected back into space rather than absorbed by the earth and transformed to heat. The ability of a substance to reflect or absorb solar radiation is known as that substances' albedo. This reflection of sunlight is increased even more by snow and ice, as snow and ice have a very high albedo. Snow may reflect as much as 90 per cent of the incoming energy, whereas a snow-free surface such as soil or vegetation may reflect only 10 to 20 per cent

Historically, one could say that the Arctic is trapped in a "vicious circle" of cold. Because arctic temperatures are cold, there is snow and ice for much of the year. Because snow reflects sunlight, and ice prevents the Arctic Ocean from having a major moderating effect on the climate, temperatures are cold.

This "vicious circle" of cold is being altered. As fossil fuel emissions continue to increase globally, heat-trapping gases accumulate in the atmosphere, resulting in a warmer arctic climate. Warming trends result in decreased snow and ice cover. With the

resulting decrease in reflected energy, absorption of solar radiation increases, adding heat to the system and causing more snow and ice to melt.

Precipitation

Another general characteristic of the climate is that there is very little precipitation—often less than 150 millimetres per year. This is why the Arctic is sometimes described as a cold “desert.”

There is little precipitation partly because water in the circumpolar region is covered by ice for much of the year. This prevents water from evaporating into the air. In the summer, when the ice melts, generally cool temperatures in the region limit the moisture-carrying capacity of the air. Cool air cannot hold as much moisture as warm air. Because there is seldom much water vapour in the air, only a minimal amount of snow or rain falls, even when conditions are right for condensation and precipitation.

Much of the sparse precipitation that does fall in the Arctic is light, fluffy snow with little moisture content. It can be blown about, rippled, drifted, and packed by driving winds. Groundstorms, with hard-blowing snow, can be a serious hazard to travellers in the Arctic.

Snow does not usually fall in the Arctic in great amounts at any one time. Because of limited melting, however, snow builds up throughout the winter and is quite persistent. In some parts of the Arctic the snow can last

up to 10 months of the year. There is evidence that melting is increasing in recent years.

Except for areas near open water, arctic skies are often clear. This is because there is not enough water vapour in the air to form heavy clouds. This also contributes to cold temperatures. When there is no cloud cover to trap the heat that is radiated from the earth, any warming that the sun manages during the day is quickly lost at night.



There is little precipitation in the Arctic because water is covered by ice most of the year.



In the Arctic, snow builds up in the winter, and the skies are often clear.

The general dryness of the air in the Arctic also affects the “feel” of the cold. The cold can be sharp and biting. But because the air (except near open water) is dry, the cold is not penetrating. Layers of warm clothing offer adequate protection to those who travel and work outside. People do not often suffer from a bone-chilling dampness that sometimes occurs in other regions. In cool, moist climates clothing gets damp. Damp clothing absorbs and drains off body heat.

Wind, as well as dampness, affects the “feel” of the cold. The body loses heat when it is exposed to moving air. The faster the wind blows, the more rapidly the body loses heat and the colder it feels.

The Subarctic Climate

In general, subarctic temperatures are hotter in summer and colder in winter than temperatures in the Arctic. When both summer and winter temperatures are taken into account, however, the Subarctic has higher annual average temperatures than the Arctic. Generally, the Subarctic receives slightly more precipitation than the Arctic. Subarctic precipitation generally ranges up to 250 millimetres or 300 millimetres per year.

In spring and summer there are long hours of daylight in the Subarctic. The angle of the sun’s rays becomes much more acute than in the winter.

CLIMATIC FEATURES OF SPECIFIC ARCTIC REGIONS

Arctic Ocean Icepack

The cold over the permanent icepack in the Arctic Ocean is persistent throughout the year, but it is not extreme. There is a relatively modest range between average summer and winter temperatures in the region.

Much of the winter is sunless. The sky is usually clear, and the air is stable. January temperatures average from -30°C to -35°C . The lowest temperature recorded is approximately -50°C .

Darkness disappears entirely for much of the summer. Long days of sunshine cause the sea ice to melt around the shore. Summer temperatures rise to about -5° to $+2^{\circ}\text{C}$. There may be some water on the surface of the icepack as the snow melts.

In summer, moist air comes from the south. There is often fog, especially near the icepack edge. Rain as well as snow can fall. Most precipitation occurs in late summer and fall. Total precipitation is sparse, about 125 millimetres per year.

Greenland Icecap

Greenland’s interior has low temperatures throughout the year because of high elevations and the huge interior ice sheet. The average temperature in summer is about -10°C . The temperature rarely rises much above freezing.

In winter the average summer temperature is about -40°C . The lowest recorded temperature is -66°C . In both summer and winter, this region is an average of 10° colder than the Arctic Ocean icepack region.

Annual precipitation on the icepack is about 150 millimetres. However, up to 500 millimetres can fall on the southern and western parts of the ice sheet.

Continental Coasts

The continental coastal region is comprised of the northern coasts of North America and Siberia. Here, the climate is transitional



These icebergs are calving from the glaciers of Greenland's icecap. The huge icecap keeps temperatures in the interior of Greenland low.

between the climate of the Arctic Ocean icepack and the climate of the continental interiors. The region is affected by eastward-moving frontal systems. It is subject to winds and storms in all seasons.

In winter the Arctic Ocean does not have much of a moderating impact on the coastal region because it freezes. Dry, cold air masses push from the polar region into the interiors of the continents. During this season temperatures are as cold as, or colder than, temperatures further north.

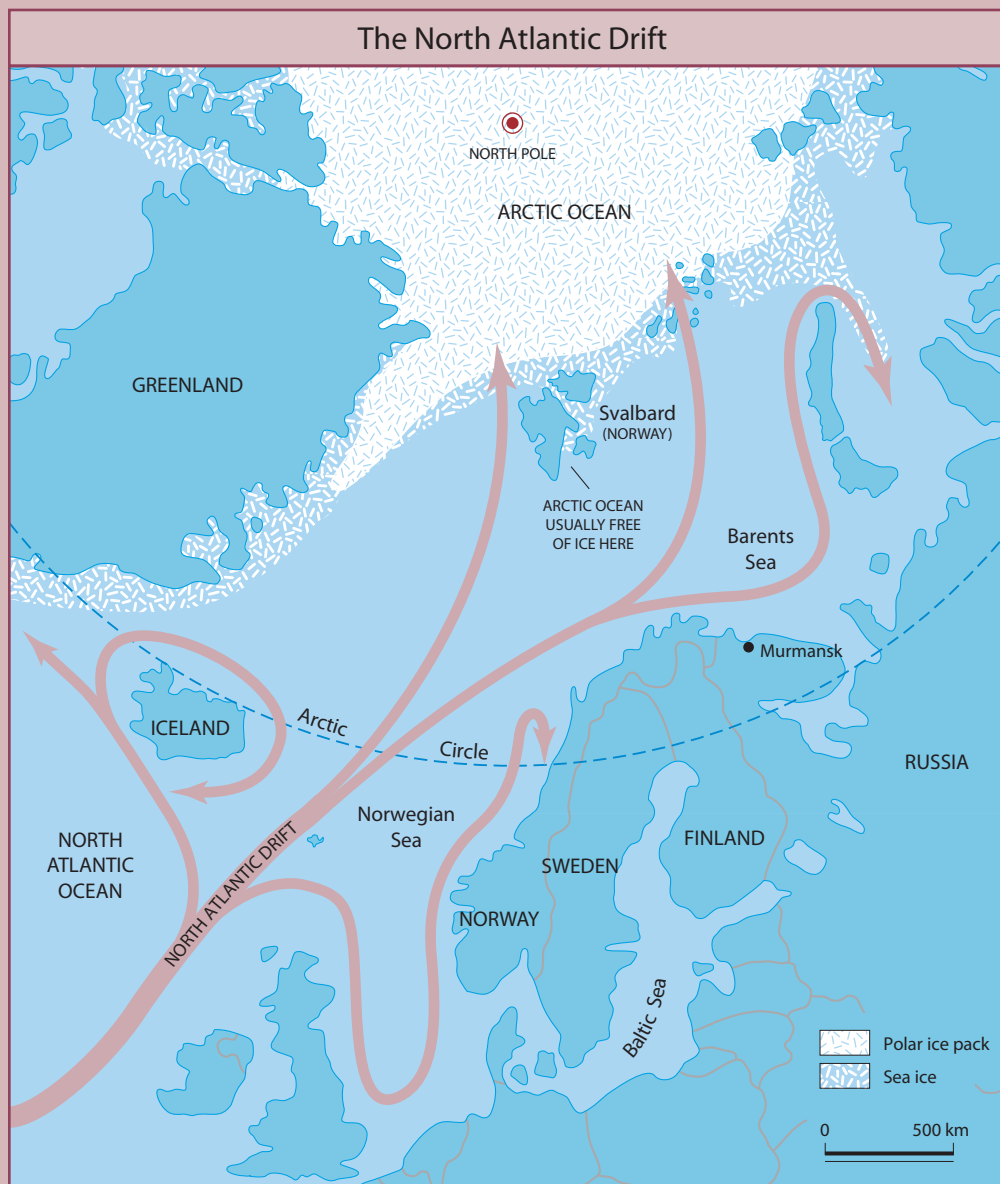
For a few months in the summer, coastal temperatures rise just above freezing, but still average less than 10°C. Peak temperatures may go as high as 25°C or 30°C. The sea ice in coastal regions melts.

The annual precipitation in this coastal region is between 100 millimetres and 250 millimetres, which makes it a dry region despite being near the ocean. Most of the precipitation falls from June through September. Even in summer, this precipitation falls as snow, rain, or sleet.

Western Scandinavia and Iceland

A branch of the Gulf Stream, the North Atlantic Drift, takes warm water up the west coast of Scandinavia to the Norwegian and

The North Atlantic Drift is an ocean current that takes warm water to the Norwegian and Barents Seas. The current has a moderating influence on the west coast of Scandinavia, as well as Iceland and northwestern Russia.



Continued on next page...

Continued from previous page.

Barents Seas. The flow of this warm current, coupled with westerly winds, creates an unusual climate in the region. Even some areas located north of the Arctic Circle do not have a true Arctic climate.

The moderating maritime influence of this current extends along the coast of Norway all the way to the northwestern part of Russia, around Murmansk. In its westerly reaches, the current moderates the climate of Iceland. A minor offshoot of the current even has some moderating impact on the southwest coast of Greenland. Perhaps its most remarkable impact is on the Norwegian Island of Svalbard. There, in winter, the Arctic Ocean is commonly free of ice at 81°N. Open water is not found that far north anywhere else in the Arctic Ocean.

The Baltic Sea also moderates the climate of Denmark and the southern parts of Norway,

Sweden, and Finland. Wherever the open ocean has an impact (particularly where warm currents are coupled with onshore winds), winter temperatures are warmer and summer temperatures are cooler than in landlocked places at the same latitude. There is usually a narrower range between summer and winter temperatures than there is in landlocked locations.

These coastal locations also have much more precipitation. Most of this precipitation is rain. Snow that does fall tends to be wet, heavy, and likely to melt quickly. These facts are illustrated in the climate of Narvik, Norway. Narvik lies north of the Arctic Circle at 68 1/2°N. The average temperature in the coldest months is only about -4°C. The average temperature range from summer to winter is about 18°. In Narvik, it rains or snows on more than half the days of the year.



The North Atlantic Drift and the Baltic Sea moderate the climate of coastal regions of Norway. Coastal locations, however, have more precipitation, especially rain, than landlocked areas.

A TYPICAL ARCTIC CLIMATE

Tiksi, Russia, at 71 1/2° N, has a typical arctic climate. Its annual mean temperature is -13.3°C. July temperatures have gone as high as 31°C and as low as -3°C. The July daily mean temperature is about 8°C. In January, actual temperatures have ranged from -5°C to -50°C, and the daily mean temperature is approximately -32°C. The annual average precipitation is approximately 137 millimetres. More than two-thirds of Tiksi's precipitation occurs from June through September.

A TYPICAL SUBARCTIC CLIMATE

Yellowknife, Northwest Territories, at 62 1/2°N, has a typical subarctic climate. Its annual mean temperature is -5.2°C. Its July temperatures have gone as high as 32.5°C and as low as 0.6°C. The July daily mean temperature is 16.5°C. In January, the record high temperature is 3.4°C and the record low is -51.2°C. The January daily mean temperature is -27.9°C. The average annual rainfall is 154 millimetres and the average annual snowfall is 1439 millimetres. When the snowfall is reduced to an equivalency in rainfall, and the two amounts combined, the annual precipitation is 267 millimetres. More than 60 per cent of this precipitation falls from June through October.

The snow melts. The great land mass heats rapidly. This means a fairly rapid rise in temperatures.

Daily average temperatures in the warmest months are between 10°C and 20°C. Daily highs can sometimes reach well into the 30°C range. Lakes are open and the summer

heat produces convection activity, so the region has more precipitation in the summer.

During winter, daylight hours are very short. The sun's rays are oblique. The vast land cools rapidly. There is a big drop in temperatures. Daily average temperatures in the coldest months are in the vicinity of -20°C to -30°C. Daily lows can easily drop into the -40°C range, with record temperatures hitting as low as -60°C. The small amount of precipitation that falls in the Subarctic in the winter is snow. Snow covers the land for up to seven months.

Subarctic winters are shorter than arctic winters, and there are at least a few hours of light each day. Although temperature inversions can cause winter ice fog, often there is clear sky and dry, calm air. There is enough moisture and warmth in the summer to support the growth of trees. There are many communities in the subarctic region of the circumpolar world, some with sizable populations. This shows that many people see the Subarctic as an attractive place to live.



In the Subarctic, the angle of the sun's rays allows the land mass to heat rapidly. Daily highs can sometimes reach into the 30°C range.

Subarctic winters are shorter than in the Arctic. In the subarctic summers, there is enough moisture and warmth for trees to grow.



WIND CHILL

The loss of body heat to blowing wind is known as **wind chill**. Body heat is lost more rapidly in low temperatures when wind speed increases.

Meteorologists in the circumpolar world often announce wind chill equivalents as well as actual temperatures. They do this to give people an estimate of how cold they will feel when they step outside, given the present temperature and wind speed. They describe wind chill by stating the length of time it takes for exposed flesh to freeze (to suffer frost-bite). Or they may use a mathematical notation to express the rate of heat loss from a specified unit-area of the body's surface.

The easiest description of wind chill to understand is the "feels-like" description. When the temperature is -20°C and the wind blows at 60 kilometres per hour, meteorologists may say the wind chill makes the temperature feel like -50°C .



Wind chill can make -20°C feel like -50°C .

ASK ELDERS

Ask elders if they have observed changes in the climate during their lifetimes. If they have, ask them to describe these changes in detail and to think of reasons for them. Record and analyze these reasons.

OUTDOOR LAB

Keep a daily record of high and low temperatures, cloud cover, precipitation, and wind directions and speeds throughout the year. Note significant highs and lows. Calculate averages and totals.

SEARCH

Chart any changes in climate over the last 100 years. What has made the greatest impact on climate change?



This Greenlandic meteorologist is releasing a weather balloon so that he can observe the air currents. From his observations, he will be able to make some predictions about the weather.

Web Resources

Arctic Climate Impact Assessment

<http://www.acia.uaf.edu/pages/scientific.html>

Ecoaction

<http://www.ecoaction.gc.ca/index-eng.cfm>

Pembina Institute Sustainable Energy Solutions

<http://www.pembina.org>

Environmental Education Resources for Northern Canada (eenorth)

<http://www.eenorth.com/eenorth/index.cfm>

Climate change North

<http://www.climatechangenorth.ca>

Land

CHAPTER 13

April 24

I received a note from Jimmy today. It says, "Hi! Here's my land report you've been waiting for." Unfortunately there is no report enclosed, so I am writing to tell him that!

April 26

A second package arrives from Jimmy. His report is enclosed. His note reads, "Gotcha!" I smile as I remember his gentle sense of humour and how much he likes practical jokes.

Land in the Circumpolar World Landforms

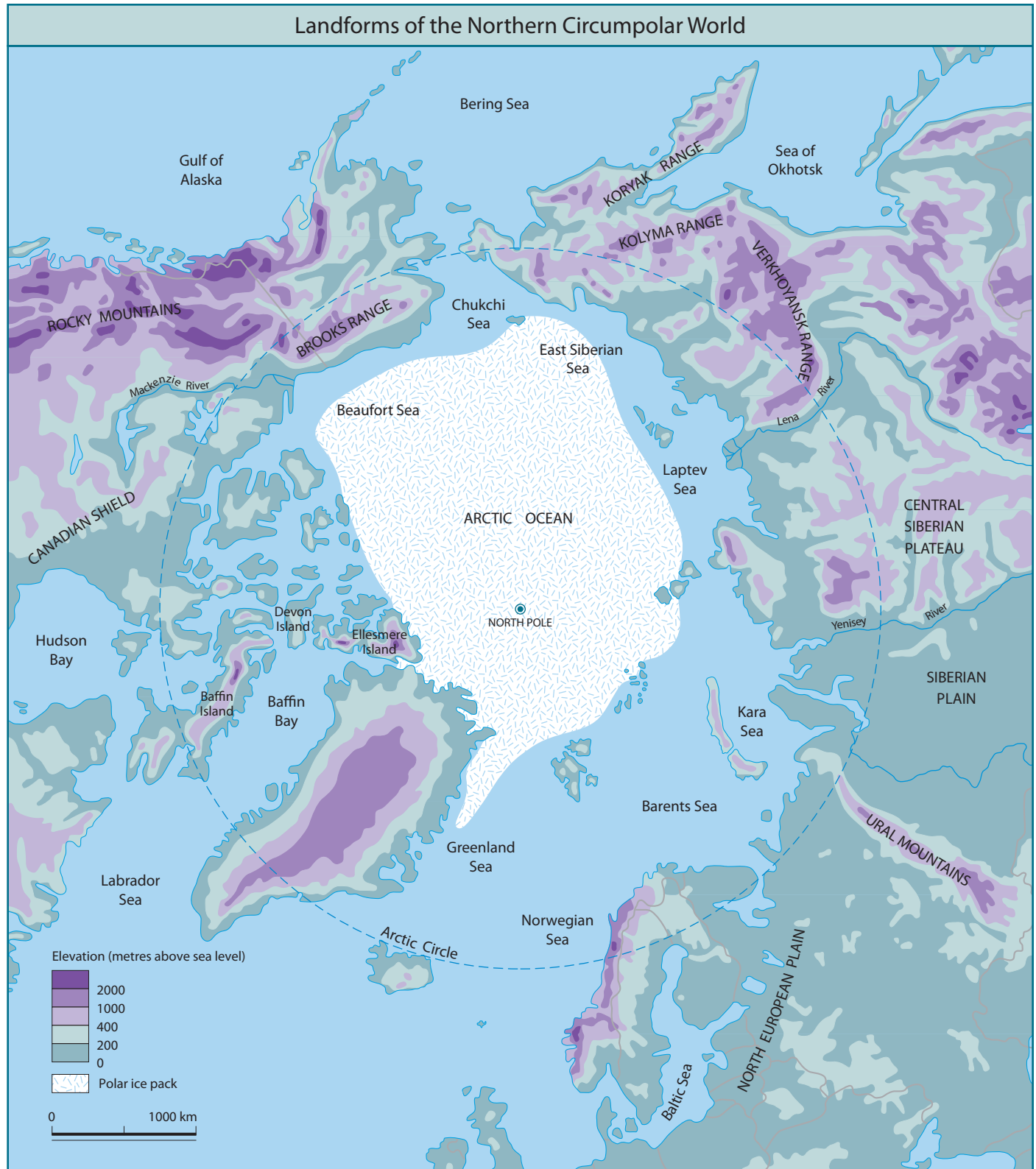
Of the various landforms in the northern circumpolar world, plains cover the greatest area. There are vast expanses of plains and low-lying rocky shield areas surrounding the Arctic Ocean. Much of the northern coasts of continental North America and Russia are coastal plain. The coastal plain extends for some distance out into the Arctic Ocean where it is called the continental shelf. The western and central parts of Canada's northern islands are plains too. So is the entire western part of Siberia, between the old, eroded Ural Mountains and the Yenisey River.

There are also hills and plateaus in the interiors of the North American and Eurasian continents. The most prominent plateau is located in north-central Siberia between the Yenisey River

and the Lena River. It averages more than 1000 metres in elevation.

There are mountains in the circumpolar region too. Mountains are found in Alaska, and in Canada on Baffin, Devon, and Ellesmere Islands, and west of the Mackenzie River. They are found in Greenland, Iceland, Norway, Sweden, and in the western and northeastern parts of Siberia.

The highest peaks in the northern circumpolar world are Mt. McKinley, Alaska (6198 metres above sea level), and Mt. Logan, Yukon (5951 metres). Barbeau Peak on Ellesmere Island (2,616 metres) is the highest peak in Nunavut. Mt. Sir James McBrien (2,762 metres) part of the Mackenzie mountains is the highest peak in the Northwest Territories. Many of the other mountains in the circumpolar world are in the 2000 to 3000 metre range. Lesser peaks can be quite spectacular when they rise up out of the sea as they do in Norway, Greenland, and on



Examples of all major landforms—plains, **plateaus**, hills, and mountains—are found in the northern circumpolar world.

Baffin and Ellesmere Islands. Finally, there are low mountains as well. The Ural Mountains in western Siberia have peaks less than 2000 metres above sea level. The Urals are old mountains with rounded peaks and slopes that have

been weathered and worn down through time. **Precambrian Shield**

Much of the lower-lying land in the northern circumpolar world is either Precambrian Shield, Arctic lowlands or tundra. Large areas of

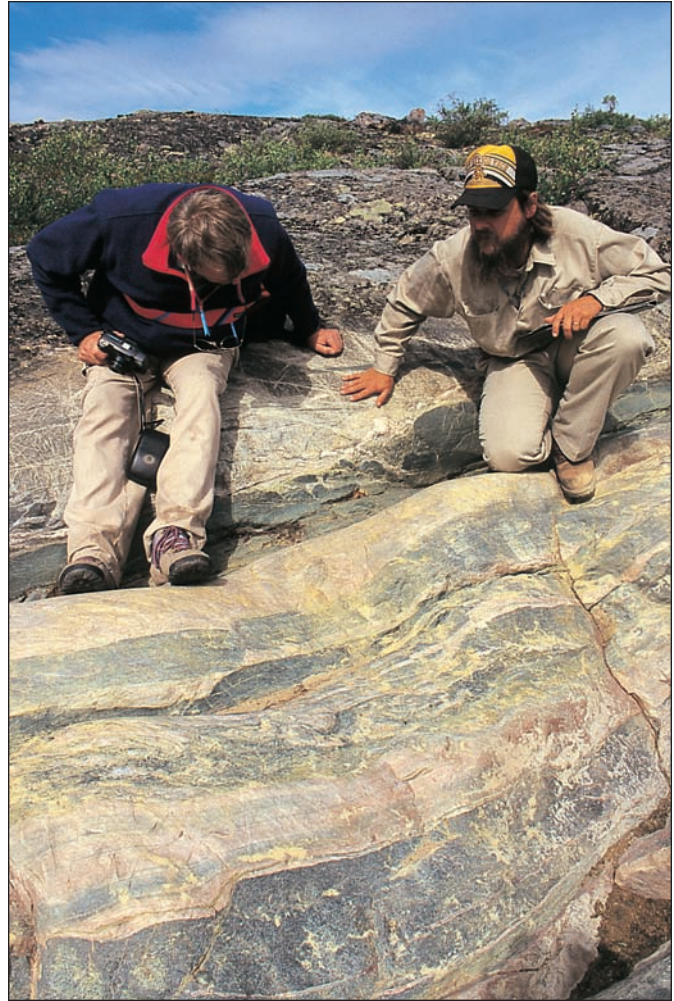
Precambrian Shield are found in both Canada and Russia. The Shield is made up of igneous rock. The precambrian shield was the first rock to form the crust of the earth about 4.2 billion years ago.

Much of the Precambrian Shield was invaded by continental ice sheets during the ice ages. These massive sheets of ice were extremely heavy. Moving like bulldozers, they stripped soil from the land and picked up boulders. Some of these boulders became frozen into the base of the ice sheet and acted as scouring pads. They tore at the surface of the bedrock, leaving marks that can be seen today.

As the ice began to melt and recede, it left hollows in the bedrock that filled with meltwater. These became thousands of lakes. The melting ice left behind deposits of sand, gravel, and rocks. Some of this material remains here and there on the land. It is called glacial till. Some of the lighter material was deposited by rivers and streams that flowed under the ice sheet. These deposits, called eskers, can be seen today as sand and gravel ridges that snake across the flat land in a variety of curving patterns. Some of the material was deposited in low, rounded hills called drumlins. All point in the direction the ice was receding Plains

The Arctic lowlands or tundra of the circumpolar world are covered by deep deposits of earth materials. Some of this material originated in glaciers. These are called glacial deposits. Some of it originated in weathered and eroded material that was carried by streams and deposited before it reached the sea. These are called alluvial deposits. Some of it originated in underwater deposits that surfaced as the land rose or as the icecaps formed and the sea receded. These are called marine deposits. The result of this glacial action and deposition is a gently rolling land with low elevation and rocky surface carved by numerous lakes and rivers.

These deposits were left behind by a glacier as it melted and receded.



These geologists are examining Acasta gneiss, the world's oldest rock. It is found near Great Bear Lake in Canada's North.





The huge ice sheets of a glacier, like this one, erode and shape the underlying landforms. The eroded material deposited by a receding glacier will leave landforms such as eskers and drumlins.

Climate and the Land

The climate and the action of glaciers, affects land forms in the circumpolar world. Rock-strewn landscapes may be seen again and again. Many of these are produced from bedrock by the powerful breaking action of alternating warming and cooling and by the action of frost and ice. When water gets into a crack in a boulder and freezes, it acts like a powerful wedge that pries apart the rock.

The climate affects the land in other ways too. Cool temperatures slow the decomposition of dead plants and hold back the soil-formation processes. In the Arctic, the soil is often peat-like and poor in nutrients.

Spring meltwater, and occasional flooding, leave the land surface soggy and marshy in the early summer.

The land is poorly drained because the permafrost prevents seepage. Cool temperatures and the reflection of the sun's rays off the snow and ice are responsible for the low rate of surface evaporation.



Cracks form in rock as a result of temperature change and water action. Often, vegetation begins growing in the cracks.



Which northern circumpolar countries have the most permafrost?

PERMAFROST

Permafrost is an interesting feature of the Arctic and Subarctic. Permafrost is permanently frozen ground. It is found where ground temperatures remain below 0°C for two or more years in a row.

Permafrost is *continuous* in the Arctic. In the Subarctic, permafrost is *discontinuous*. This means that areas of permafrost alternate with areas subject to annual thaw.

The earth above the permafrost thaws in summer and freezes again in winter. This is called the *active layer*. The active layer varies in depth from 0.5 to 5 metres, depending upon summer temperatures.

Permafrost gets into gravel, sand, clay, or other soils, or even bedrock. It usually contains ice, but not always. Where there is ice content, it surrounds the ground particles and binds them into a solid mass. The stress forces of this ice can cause various unusual features such as mud pots, frost blisters on the land's surface, or even soil-covered ice mounds called pingos. These can be as many as 60 metres high. There are pingos in Tuktoyaktuk, Northwest Territories.



The land has poor drainage because permafrost prevents water from being absorbed into the ground.

Non-renewable Resources

Northern circumpolar land is well endowed with non-renewable resources. Here, there are important deposits of petroleum and of minerals. Natural gas and oil are generally found on the plains and continental shelves. Minerals are often found on the Canadian Shield

Petroleum is found offshore, and sometimes onshore, in Alaska, Canada, Denmark, Norway, and Russia. There are significant deposits of oil and natural gas under the Greenlandic glacial ice shelf. There is a great variety of minerals, too. Barite, coal, gemstones, gold, lead, platinum, and silver have been mined in Alaska, and there is potential for more. Canada has copper, diamond, gold, lead, nickel, silver, tungsten, uranium, and zinc. Greenland has cryolite. It also has indications of other minerals, though perhaps not in commercial quantities. Iceland is not noted for minerals but it has great geothermal energy resources. Norway has coal (on Svalbard Island), copper, iron, lead, nickel, and zinc. Denmark has no metallic minerals, but produces salt, limestone, clay, and gravel. Sweden has copper, iron, lead, silver, uranium, and zinc. Finland has copper and nickel. Russia has aluminum, apatite, coal,

cobalt, copper, diamond, fluorite, gold, graphite, iron, manganese, mercury, nickel, platinum, silver, tin, tungsten, and various rare-earth metals, much like Northern Canada.

Although exploiting northern minerals is expensive and complicated, mining and petroleum production are significant parts of the economies.

Russia has made far greater use of its arctic minerals than any other circumpolar country, but often at the expense of the environment. This is partly because mineral self-sufficiency was a political goal of the former communist government. That government did not want to rely on western countries to supply important minerals.



These diamonds were mined in Russia.

OUTDOOR LAB

Take a walking tour of the land around your community. Find evidence that your region was, or was not, once covered by a continental ice sheet.

OUTDOOR LAB

In a detailed report, describe the various physical features of your area. Include impacts that the climate has had on the land. Gather rock samples and produce illustrations.

ASK ELDERS

Interview elders to find out whether changes have occurred in physical features during their lifetimes. These might be changes in rivers, collapse of embankments, soil buildup, or fractures in huge boulders.

SEARCH

Research permafrost in your region. Describe how it creates problems for people. How are these problems overcome? Design a house that would be best suited to the land in your region. Consider what material would be best used for building? What type of heating? Should your house be above or below ground?

SEARCH

Research which minerals or quarry products are found in your region. Note details in four categories: those mined in the past; those currently mined; those discovered but not yet exploited; those yet to be discovered, but believed to be present. Create an environmental policy for mine owners. Include the top five actions that mine owners can take to lessen the environmental impact of mining in your region.

WEB LINKS

National Oceanic and Atmospheric Administration

<http://www.arctic.noaa.gov/detect/index.shtml>

Polar Continental Shelf Project

http://polar.nrcan.gc.ca/arctic/geography_e.php

National Snow and Ice Data Centre

<http://nsidc.org/glaciers>

Plants

CHAPTER 14

April 27

I heard from Niels today. Now that he's back home, he says he realizes more than ever that he shouldn't have pressured me in Alaska. He apologized. He says he wrote to the Jacksons to thank them for the friendly and generous way they treated us in Anchorage. Here is his report.

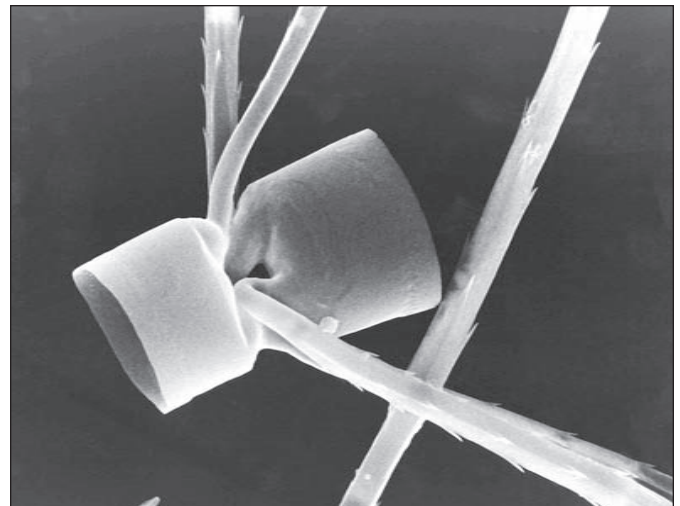
Plants of the Circumpolar World Ocean Plants

Phytoplankton, a single celled plant, is the simplest form of plant life and it lives in the ocean. They make it possible for an abundance of animal life to thrive in northern seas.

Many types of phytoplankton are made up of a single cell. Individual cells can be seen only through a microscope. However, phytoplankton are visible because their populations are so thick that they appear coloured in the water. In colonies, they appear brownish-green.

Phytoplankton live only near the ocean surface where sunlight can reach them. This is called the *photic zone*. This zone is about 100 metres deep. Most phytoplankton float and drift in this zone. Some types, however, have tiny hair-like extensions that help them stay suspended in the water

Phytoplankton use sunlight, water, carbon dioxide, and nutrients left by decaying plants and animals to produce starch and carbohydrates. This



This is a photograph of phytoplankton that has been magnified approximately 4000 times. This type of phytoplankton is called Chaetoceros concavicornis.

process, called *photosynthesis*, produces food for the plant

Because phytoplankton need sunlight for photosynthesis, their renewal and growth is restricted to spring and summer. When the sun



Some lichen, like this orange-coloured lichen, is hardy enough to grow on high rocks in the Arctic.

returns to the northern skies, there is a large-scale “blooming” of these tiny plants.

Because phytoplankton produce their own food, by photosynthesis, they are the foundation of the food chain in the ocean. They serve as food for tiny animals called zooplankton. Together, phytoplankton and zooplankton serve as food for larger animals such as fish and whales. Indirectly, phytoplankton feed all the animals that live in the ocean. Animals that do not eat phytoplankton directly still depend for their food upon animals that do eat them.

Land Plants

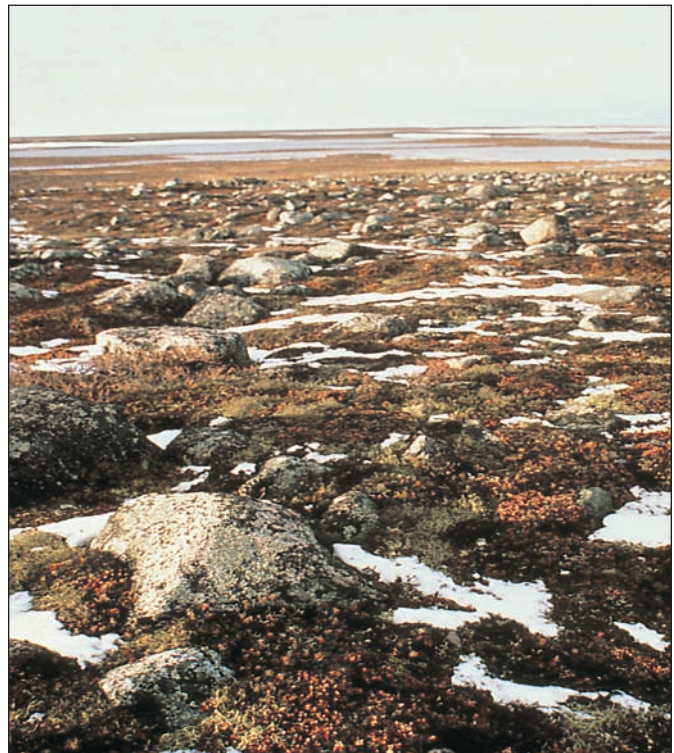
The Arctic Icecap and Mountains

The high arctic and mountain regions are among the most difficult places in the world for plants to live. Cold high winds and lack of soil make living conditions unfavourable. Even here, though,

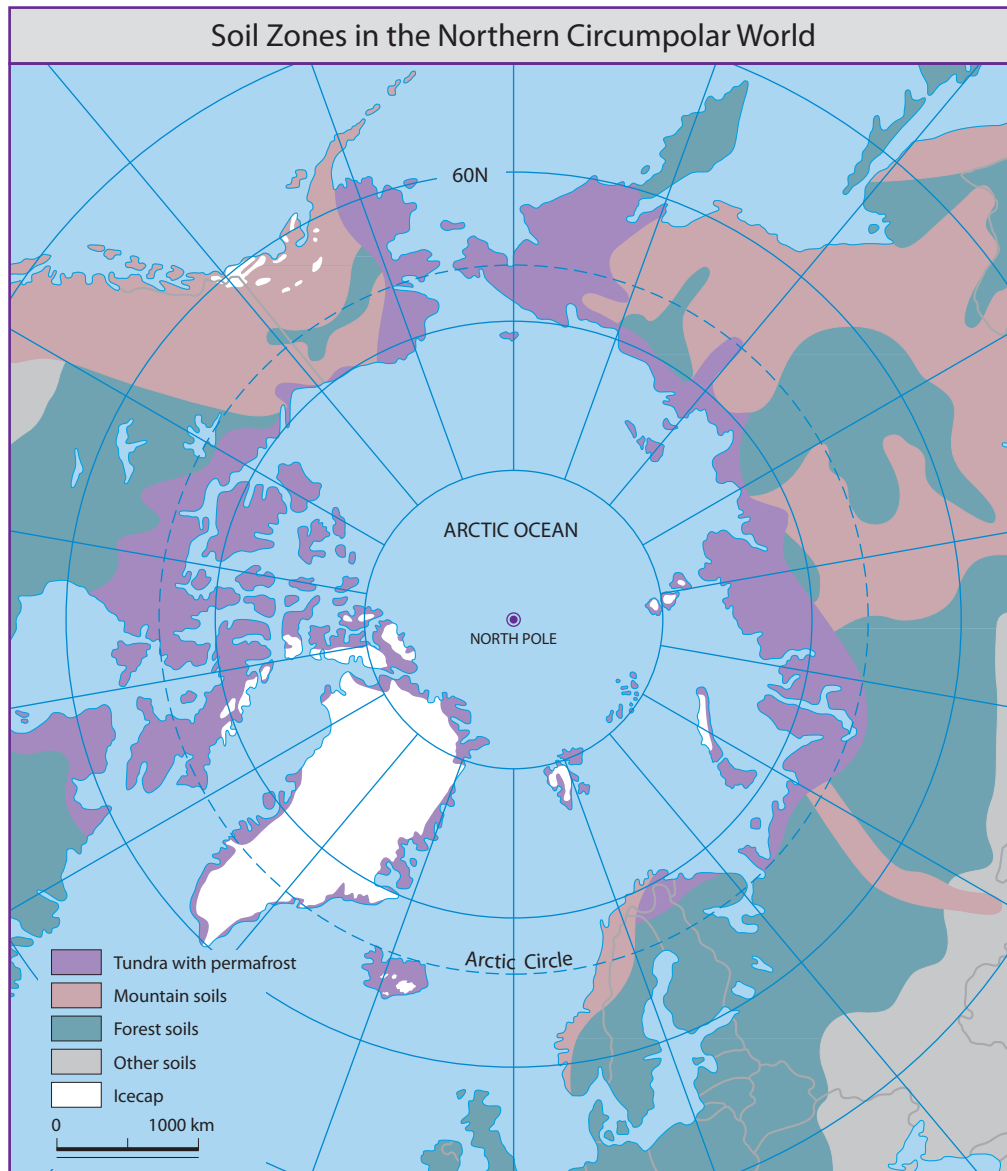
plants still manage to root themselves and cling to life. Some red algae inhabit snowfields that persist throughout the summer, as well as the surfaces of glaciers and sea ice. Some hardy lichens grow on rocks high in the arctic mountains. More developed plants bravely assert their right to life in valleys, along streams and coastal areas, and in tiny rock crevices where a small amount of soil has formed. Plants are always ready to move into new areas when there is a slight climate change or tiny bit more soil.

The Arctic Tundra

Apart from icecap and mountain areas, the remainder of the Arctic is tundra. The prevailing condition of tundra soil is bog and hummocky marshland. The soil is made up of a shallow, brown, peaty surface layer (peat is partially decomposed vegetation), underlain by a grayish zone containing few nutrients. Tundra soil is poorly drained because it rests on permafrost. Cold temperatures and high acidity prevent most bacteria and earthworms from living here.



Tundra is a broad, open expanse where winds blow without hindrance. Tundra plants, however, grow in a surprising variety and number.



Describe the differences between the types of soils found in the northern circumpolar world.

(Bacteria and earthworms elsewhere help break down organic matter such as dead plants and animal droppings.)

The tundra is a broad, open expanse where winds blow without hindrance. Tundra temperatures range from cool in the summer extreme cold in the winter. There is relatively little precipitation. The growing season is short, often no more than two months.

Cold temperatures, little precipitation, a short growing season, poor soil, poorly drained soil, and strong winds all present significant challenges to plant growth in the Arctic. Yet there are positive factors at work there as well. In summer there are long hours of daylight, with

many sunny days. Sunlight is essential to plant growth. It activates chlorophyll, an ingredient that enables plants to produce food by photosynthesis. The strong winds spread the seeds of successful plants far and wide. The result is that tundra plants grow in a surprising variety and number.

As a consequence of all the physical factors working upon them, tundra plants develop some common characteristics. Almost all species are perennials. This means they last from year to year. Once established, individual plants lie dormant under the snow, then become active again in the spring and summer.

Tundra plants are hardy enough to withstand cool temperatures and strong winds. Their tissues are more resistant to freezing and thawing than the tissues of plants in other climes. They are

generally smaller, so that they can economize on available resources. They have relatively short root systems because of the presence of permafrost. Many species have hairy leaves and stalks. This helps them to trap and hold heat that is radiated from the earth. Some species have leathery leaves that help them to retain moisture when the wind is blowing. Some species huddle together in dense mats to preserve their heat.

Tundra plants are short and grow close to the ground. Some woody species such as the dwarf willow huddle close to the ground as a protection from the wind. Grass and flowering species hug the ground in the first weeks of spring. They find

protection under the dead matter of the previous years' growth.

Most flowering plants on the tundra grow and reproduce quickly. Some complete their entire life cycle within one month. They begin to grow even before the snow covering is entirely gone. Their buds grow just above the ground surface (some grow just below), protected by plant parts remaining from former years.

Because tundra plants need to reproduce and grow quickly, they may reproduce by **self-pollination**, or they may reproduce asexually. One common type of asexual reproduction is known as *vegetative reproduction*. This means that parts of the parent plant detach and develop into new plants themselves. New plants that result from asexual reproduction or self-pollination do not have the benefit of a large pool of genes. This limits their varieties but they have a larger population.

Plant seeds and spores are spread by wind, water, insects, and migratory animals. Seeds



This is a dwarf willow in early spring, before its leaves have grown back. The dwarf willow huddles close to the ground for protection.

and spores may stick to such animals as bears, and later be rubbed off. Or they may be eaten by animals or birds, then dropped in their excrement, amidst a ready-made storehouse of nutrients.

The Subarctic

The change in plant life from the Arctic to the Subarctic region is gradual. There is a transition zone at the treeline where larger and



Most tundra plants are perennials that lie dormant under the snow in winter and become active in spring and summer.

new varieties of plants begin to appear. These varieties include some spindly trees.

Generally, conditions for plant life improve in the Subarctic. Warmer summers and more continuous frost-free days make a longer growing season. There is slightly more precipitation. Soil is generally more supportive of plants. All of this means that there are larger plants in the Subarctic, including trees.

In the Subarctic the soil is mostly *podzol* soil, though other types of soils are found. Podzol



Cotton grass produces a sticky cotton filled with seeds. The seeds are spread when the cotton is picked up by wind, water, insects, or animals.

soil is a brown surface layer of half-decomposed organic remains, including litter from coniferous plants. This is underlain by an acidic grayish-white layer. This layer gives the soil its name. *Podzol* comes from Russian words meaning

“ashes underneath.” Podzol soil is not well suited to agriculture, but if lime and fertilizers are added, hardy crops of hay, oats, barley, or potatoes can be grown.

Natural plant life in the subarctic zone is dominated by trees. These are stunted, spindly, and sparse in the more northerly regions, near the tundra. Further southward, trees grow in greater numbers. They grow closer together and are larger.

Pine, fir, tamarac (larch) and spruce are most common in subarctic forests. Pines grow on rocky and sandy ground with little water. Spruce are usually found on damp till and clay soils, often in lower lying areas. There are broad-leaved trees in subarctic forests too: birch, poplar, willow, and alder. These grow in the well-drained, richer soils: river valleys and near lake shores.

Another interesting subarctic tree is the larch. Although it is a member of the pine family, the larch is deciduous. It has needles and cones, but its needles change colour and fall off in autumn.

Subarctic forests are often collectively called the boreal coniferous forest. This is because of their northern location and the predominance of cone-bearing trees such as spruce and pine. These forests are also sometimes called the taiga, a term the Russians use to describe their coniferous forests in Siberia. This great forest zone stretches nearly around the globe, largely between 48° N and 62° N. Taiga is found in Alaska, Canada, Scandinavia, and Russia. The boreal coniferous forest is the world's largest, most uninterrupted zone of vegetation.



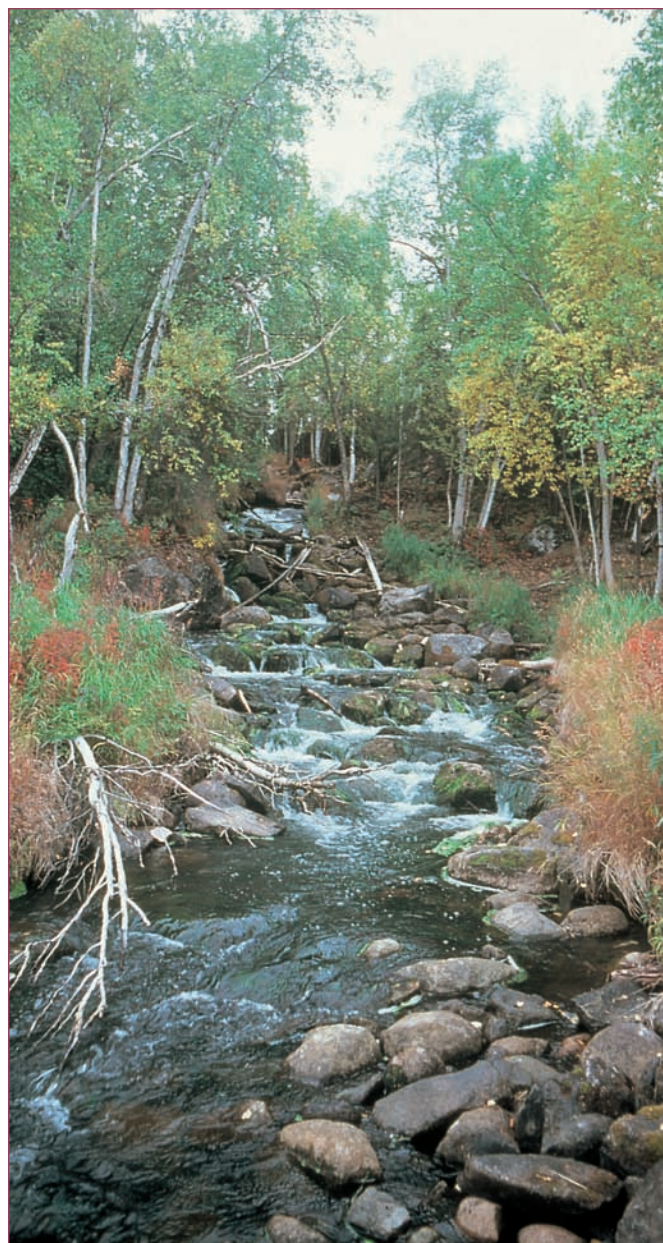
Pine, fir, and spruce are most common in the subarctic forest. This jack pine grove is growing on rocky ground.

Remarkably, it has evolved to its present state in the 10 000 years since the last ice age. Of course, there are many other plants that grow in the Subarctic. These include rock and tree lichens, mosses, grasses, and sedges. They include plants such as pond lilies, cat-tails, kinnikinnick, and Labrador tea. A wide variety of berries such as cloudberries, raspberries, gooseberries, and Saskatoons grow here. Flowering plants such as purple skullcap, yellow mastodon, fireweed, and wild rose live here too.

Though limited in varieties and numbers when compared to warmer, well-watered parts of the world, plant life in the Arctic and Subarctic supports a range of animal life. This is what makes human habitation possible.



Reindeer moss



Broad-leafed trees grow in subarctic forests because the soils are well drained.



Dwarf Birch in their fall colours at Courageous Lake, NT

FIRES

Fires in boreal forests play an important role in renewing plant life. Often started by lightning, forest fires destroy old growth which might be infected with insect pests and disease. They burn up litter on the forest floor that can choke out new plant growth. They open up the canopy of a forest and allow sunlight, warmth, and moisture to reach the forest floor. This stimulates new growth of shrubs and saplings. This new growth is supported by nutrients from the decaying remains of the burned-out area. By these means, forests are renewed and strengthened.



Forest fires destroy old growth so that new plant life can begin.

TYPES OF TUNDRA PLANTS

The numerous tundra plants include lichens, mosses, ferns, grasses, and sedges. Sedges are grass-like plants that often grow in thick tufts in marshy places. Unlike grasses, sedges have solid stems.

Fruit-bearing tundra plants include bearberries, blueberries, cranberries, crowberries. There are woody shrubs such as dwarf willows, alders, and birches. Less than a fraction of a metre high, these are among the largest plants on the tundra.

On bright summer days many tiny, colourful flowering plants appear on the tundra. Among them are plants such as white cotton grass, Arctic white heather, pink willow herb, purple saxifrage, yellow buttercups, marsh marigolds, sky-blue forget-me-nots, fuchsia rhododendrons, white mountain avens, and sun-tracking Arctic poppies.



These cranberries grow on the tundra.



Pink willow herb is one of the flowering plants that appears on the tundra.

ASK ELDERS

Research how the plants in your area have been used for technological, nutritional, ritual or medicinal purposes. Record the information in a detailed, illustrated report. Rank in order the importance of these plants to the traditional Aboriginal community

OUTDOOR LAB

Select one plant species that grows in your area. Determine how it has adapted for survival in your climate. Describe these adaptations in an illustrated report.

OUTDOOR LAB

Collect, identify, organize, and display samples of the full range of plant life in your region.

OUTDOOR LAB

Describe how saxifrage has adapted to the arctic tundra.



WEB LINKS

eLibrary (password protected)

<http://elibrary.bigchalk.com/libweb/canada/do/login>

NWT access - Username: govont0201 Password: elca

CultureGrams (password protected)

<http://online.culturegrams.com/>

NWT access - Username: govnorthwest Password: welcome

Northern Research Portal-University of the Arctic

<http://scaa.usask.ca/gallery/northern/content?pg=onlineresources>

Edge of the Arctic Shelf

http://www.who.edu/arcticedge/arctic_west02/facts/facts_plants.html

Arctic Change

<http://www.arctic.noaa.gov/detect/index.shtml>

Churchill, Polar Bear Capital of the World

<http://www.chem.ucla.edu/~alice/explorations/churchill/botanize.htm>

Animals

CHAPTER 15

April 29

The animal report has arrived from Johannes. In his note he refers to our ski-jumping escape. He says the Arctic Winter Games should include ski-jumping. He wants to win a gold medal but he's not sure if he would since the Sami now compete in the Games.

Animals of the Arctic and Subarctic Land Animals

A number of conditions in the northern circumpolar world have a strong influence on animal life. These conditions influence their physical appearance, their abundance, their choice of habitat (their living environment), and their behaviour. The most important of these conditions are low levels of precipitation, relatively sparse vegetation, prolonged snow cover, extremely cold winter temperatures, and a greater range of temperatures from summer to winter than in any other region of the world.

There are relatively few animal species in the northern circumpolar world compared to warmer climates. Yet within the species that do

live in the Arctic and the Subarctic, there is often an abundance of individuals.

Like humans, animals live wherever they can find food. Some arctic animals are plant-eaters (herbivores), and some are flesh-eaters (carnivores).

Some eat both plants and other animals (omnivores). But in the end, all animals depend upon plants. Where there are plants, plant-eating animals can survive. Where there are plant-eating animals, flesh-eating animals can survive. Therefore, animals live where plants live.

A surprising number of animals live on the tundra. Although vegetation is limited, the area



Medium-sized tundra animals include the gray wolf. Gray wolves are meat-eaters. They generally prey on larger animals, such as caribou.

covers millions of hectares. So each animal has a relatively large range over which to forage for food.

Common Arctic Animals

Insects flourish in the Arctic. Bees, beetles, moths, and butterflies live wherever flowering plants grow. Mosquitoes and black flies live wherever there are both pools of standing water as well as sources of running water. Mosquitoes and blackflies need blood to reproduce so they live where mammals are present to feed on their blood.

Arctic rivers and lakes are well stocked with fish. Most well known among them are trout, grayling, whitefish, cod, char and some salmon.

In the northern circumpolar world there are very small land mammals such as lemmings, voles, and arctic ground squirrels. These animals are herbivores. They reproduce rapidly and have a short life span. One pair of lemmings may have 100 descendants within a year. They are an important food source for ermine, foxes, owls, and gyrfalcons. Their numbers—which rise and fall in predictable cycles—govern the numbers of some of their predators.

Medium-sized tundra animals include wolves, arctic hare, fox, and wolverine. They remain active on the tundra throughout the winter. Larger animals include barren ground grizzly bear, musk ox and, most commonly, caribou and reindeer.

Perhaps the most striking of Arctic animals is the polar bear. This bear faces no predator but humans. The polar bear is born on land, but its life is closely linked to the sea. It relies on the sea for most of its food, particularly seals. It spends much of its time on the sea ice, often near the floe edge. It is a powerful swimmer and can swim many kilometres from the shore. Its oily fur prevents ice from clinging to it. Female Polar bears need to maintain an optimum weight to reproduce. Decreasing surface area of ice in the circumpolar region is shrinking the polar bear hunting ground and resulting in bears being undernourished. One of the effects of reduced ice surface in the circumpolar regions is a decline in polar bear populations.

Polar bears are active throughout most of the year. Females will, however, spend several weeks in a den to await the birth of cubs (often two) in the spring. Bears burrow into a den and sleep for a few days or weeks in bad weather or when food is scarce.



Polar bears occasionally prowl inland looking for food when the frozen sea does not yield enough to eat.

This species is not distributed equally throughout the circumpolar world. The majority of them are found in countries where a true arctic climate prevails and where the land mass is sufficiently large to sustain the species. Fewer polar bears are found in smaller countries or where marine influences significantly moderate the climate—such as Norway and Sweden.

Common Subarctic Animals

Many animals that live in the Arctic also live in the Subarctic. These certainly include mosquitoes, black flies and other insects. They include ermine, wolves, and wolverine. They include the fox and hare, although both species are different from their Arctic cousins. There are also many different animals found in the Subarctic that are not found in the Arctic. Below the tree line there are fur-bearing animals such as marten, sable, muskrat, and beaver. There

ADAPTATIONS OF LAND ANIMALS

Northern animals often have larger bodies than their southern counterparts. This is because larger bodies have less surface area in relation to body volume than smaller bodies have. This helps retain heat better.

Northern animals often have smaller appendages such as ears, noses, and tails. These small appendages have less surface area, so less heat is lost. The legs of some northern animals are shorter than the legs of southern counterparts. Sometimes the legs have a different circulatory system from that of the rest of the body. This permits the legs to function at a much lower temperature than the body.

Feathers and fur insulate animals, and these thicken as winter approaches. Feathers may grow on legs and feet, as well as on the body. Birds fluff their feathers to trap greater amounts of body heat.

Many fur-bearing animals have double coats of fur: a thick coat of short underwool and longer guard hairs over top that trap warm air radiating from the body. Many shed their old fur coat each

year and develop a new coat that grows longer throughout the winter. Some have hollow hairs that trap air inside them. Air is a very effective insulator.

Many northern animals build up fat reserves during their summer and fall feeding. Some develop an extra layer of fat just beneath their skin. This helps to retain body heat and provides extra energy when temperatures are colder and food is in short supply.

To avoid having to gather and eat great quantities of food, some animals reduce the level of their activity in winter. They have in-built controls that slow their rate of **metabolism**. They enter a state of dormancy for at least a part of the winter. They conserve energy by sleeping part of the time. The only Arctic mammal that truly hibernates, however, is the siksik. Its body temperature drops to near freezing. Its breathing, heart-beat, and blood circulation become very slow. It remains in this state of suspended animation throughout the winter, then resurrects itself in the spring.



These musk oxen are shedding patches of their old fur coats. The musk ox has small ears, a little tail, stocky limbs, and a massive body. Beneath its coat of coarse guard hairs is a thick layer of fine wool.

Continued on next page...

Continued from previous page.

Animals that remain in the north throughout the winter burrow into the ground or snow for shelter. They may also find protection from the weather beside deep drifts along hillsides and against mounds of ice.

Rather than face winter on the tundra, some animals migrate. Many caribou move southward to find shelter and better pastures within the treeline. Wolves follow them.

The need for protection produces adaptations for survival as well. Both predator and prey use camouflage, matching their colour to their surroundings. Colours are commonly winter white and summer brown.



When they sense winter coming, sika deer retreat into their winter dens, built in dry, sandy soil. They nibble on the food they have hoarded, curl up tightly, and fall into a deep sleep, called hibernation.



Grayling is a freshwater fish that has a small mouth and a large dorsal fin. Grayling is found in streams in the Subarctic.

are tree squirrels, lynx, otters, badgers, black and brown bears, deer, elk, and moose.

A rich variety of fish live in the Subarctic. Species include perch, pike, trout, grayling, whitefish, cisco, and inconnu.

Sea Animals

Most marine life in the Arctic Ocean is found near the edge of the ice where there is plenty of food, and where marine mammals can surface to breathe. Further northward there are fewer and fewer signs of mammals because there is more complete ice cover and fewer breathing holes.

At the bottom of the food chain in arctic waters there are many small animals. These range from a basic marine animal-type called zooplankton, through to small crustaceans collectively called krill. These, as well as phytoplankton, are food for worms, sea-urchins, snails, barnacles, prawns, cockles, mussels, scallops, and clams, and for many kinds of fish: sculpin, cod, haddock, herring, capelin, halibut, and char.

There are also many warm-blooded, air-breathing sea mammals in arctic waters. Among



Seals have large bodies and few appendages, which minimizes the loss of body heat. They stay near the edge of the ice so that they are close to their food source.

these are the seal, and its relatives the sea lion and the walrus. There are many species of whale.

Sea water is always colder than the body temperature of these warm-blooded animals, so they continually lose body heat. To minimize this loss, sea mammals have adapted by having large bodies with short appendages. They also have a thick layer of fat (blubber) just beneath their skin. Fat is a good insulator, so it helps keep body heat inside. It also provides energy during times of scarce food supply or fasting, for example, when seals are on the ice surface giving birth.

Seals

Bearded, spotted, and harp seals live in Arctic waters for at least part of the year. An important species for Inuit hunters is the ringed seal. It remains in northern waters throughout the year. In addition to a layer of fat, it has a coat of fine fur to help keep it warm. Ringed seals poke breathing holes in the ice as soon as the ice begins to form in late fall. They visit these holes often during the winter to keep the holes open.

Unlike whales and dolphins which live only in the sea, the seal family relies on the sea for food, but returns to land or ice floes for mating, birthing, and nursing the young. In the spring, female ringed seals enlarge one or more of their breathing holes and venture up onto the ice. There they give birth in dens they have made in snow on

the ice. They nurse their pups for several weeks before abandoning them and returning to the sea.

Seals and walruses that migrate away from the polar icecap during the winter do not go far. They move to areas where there are breaks in the ice rather than a complete ice cover.

Whales

Whales are often divided into two categories: toothed whales and baleen whales. Beluga (or white whale) and its close relative the narwhal are toothed whales commonly found in eastern arctic waters. Another toothed whale, the orca (or killer whale), is sometimes found off the south coast of Alaska, or near Iceland.

Many species of baleen whales are found more recently moving back into the Beaufort Sea and in the Hudson's Bay. Baleen whales were given their common name because they have baleen (it is like thin strips of tough, flexible plastic) instead of teeth. The baleen filters small fish and plankton from the sea. They must eat enormous amounts of plankton, which is their main source of food.

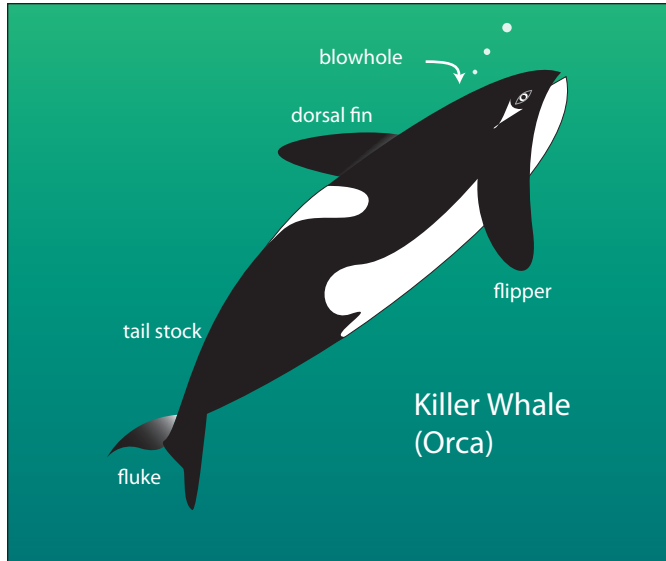
Blue, bowhead, fin, gray, humpback, minke, and sei are baleen whales. Bowheads are also called "right whales" because whalers believed



Walruses have powerful lips and short, stiff whiskers that help them gather food along the ocean floor. Males and females have tusks that continue to grow throughout life. Male tusks can grow as long as 35 centimetres.

they were the right, or best, whales to hunt. They swim slowly and usually float when they die. And they were economically valuable because they yielded large amounts of baleen and oil. They were hunted almost to extinction. They are now protected but there is a quota for subsistence hunting

Most baleen whales migrate to ice free waters for the winter. Their migrations may



This toothed whale is an orca.

cover thousands of kilometres. Occasionally a few whales become confused and trapped by the newly forming ice. If they cannot find leads in the ice that allow them to surface and breathe, they drown.

Birds

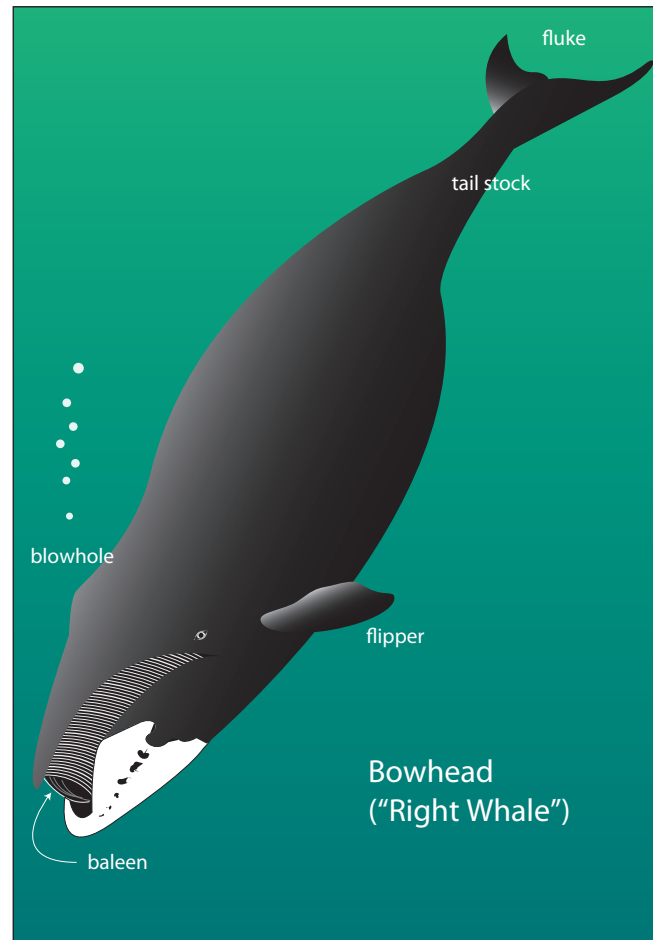
Only a few bird species remain in the north throughout the year. The most well-known of these are ptarmigan, snowy owl, gyrfalcon, and raven. Among other birds that winter in the ice-free sub-arctic are some species of auk, dovekie, eider, guillemot, gull, murre, and redpoll.

Other bird species spend only part of the year in the north. They are migrants. They breed in the north, stay a few months until their young can fly, then migrate to warmer climates for the winter. They move rather than attempt to adapt to the cold.

Many of these birds come north in the summer because they find the tundra an ideal

place to nest and raise their young. The long days are sunny and acceptably warm. There is an abundance of insects for food.

Ground nesting birds rely on camouflage, on distraction techniques (such as feigning



This baleen whale is a bowhead. What is the difference between a baleen whale and a toothed whale?

broken wings), or on fighting ability to defend their nests. Ground nesting birds include ducks, loons, sandpipers, plovers, cranes, owls, larks, and finches. Perhaps most spectacular among them are the great flocks of snow geese and Canada geese that nest each year on the tundra.

Cliff nesting birds rely on inaccessibility to protect their nests. Cliff dwellers include gulls, fulmars, kittiwakes, and murre. Various species of auks, eagles, guillemots, hawks, jaegers, petrels, phalaropes, puffins, redpolls, sparrows, snow buntings, swans, and terns also visit the north.

THE PTARMIGAN

Ptarmigan are herbivorous. They eat leaves, needles, twigs, buds, flowers, fruits, and seeds. They stand perfectly still when they are in danger, hoping they will not be seen. At last, however, they burst into noisy flight, drumming their wings as they take off. They develop a dense cover of white feathers for winter, including feathers on their legs and feet. Rock and willow ptarmigan inhabit the northern circumpolar world.



THE SNOWY OWL

The snowy owl remains white all year. It grows thick feathers on its legs. It is a flesh-eating day-feeder that relies mainly on lemmings for food. It also feeds on voles, siksiks, and occasionally young hare, or other birds. The snowy owl may periodically migrate further south when food is scarce.

THE GYRFALCON

The gyrfalcon is a flesh-eater. It belongs to a general group of flesh-eating birds called raptors, or plunderers. Gyrfalcons may grow up to 60 centimetres long and weigh as much as 2000 grams. They are whitish, grayish, or brownish, depending on their habitat. Gyrfalcons usually nest on cliffs. Family nests are maintained over scores of years. Gyrfalcons feed largely on ptarmigan, which they can attack in flight.



THE RAVEN

The raven has few visible adaptations for cold weather apart from its large body and the fact that its feather coat thickens in winter. The raven is known to be very intelligent, and capable of making a complex array of sounds for communication. It has an uncanny ability to sense the availability of food from a distance and to anticipate when kills will be made that it can share in. It has a wide range of tastes. It eats carrion (the flesh of dead animals), fruit, seeds, eggs, insects, small vertebrates (including the young of other birds), and many different foods abandoned by humans.

ASK ELDERS

Invite elders to describe in detail their traditional use of various northern animals for food, clothing, shelter, tools, weapons, and other technology. Record the descriptions.

SEARCH

Choose your favourite circumpolar animal. Prepare a detailed and illustrated report on its environmental adaptations.

SEARCH

Produce an illustrated encyclopedia containing reports on all animals which live at least part of the time in your region. Including physical descriptions and information on adaptations, feeding, reproduction, and seasonal behaviour. Determine which circumpolar animal is best suited to the environment. In what ways, if any, has global warming effected their survival.

WEB

NOAA Arctic animals

<http://www.arctic.noaa.gov/animals.html>

Arctic Studies Centre

<http://www.mnh.si.edu/arctic/html/wildlife.html>

Wildlife Division, Northwest Territories

www.nwtwildlife.com

Ecokids

http://www.ecokids.ca/pub/games_activities/the_north/index.cfm

Thinkquest – Arctic Animals

<http://library.thinkquest.org/3500/>

First Peoples

CHAPTER 16

April 30

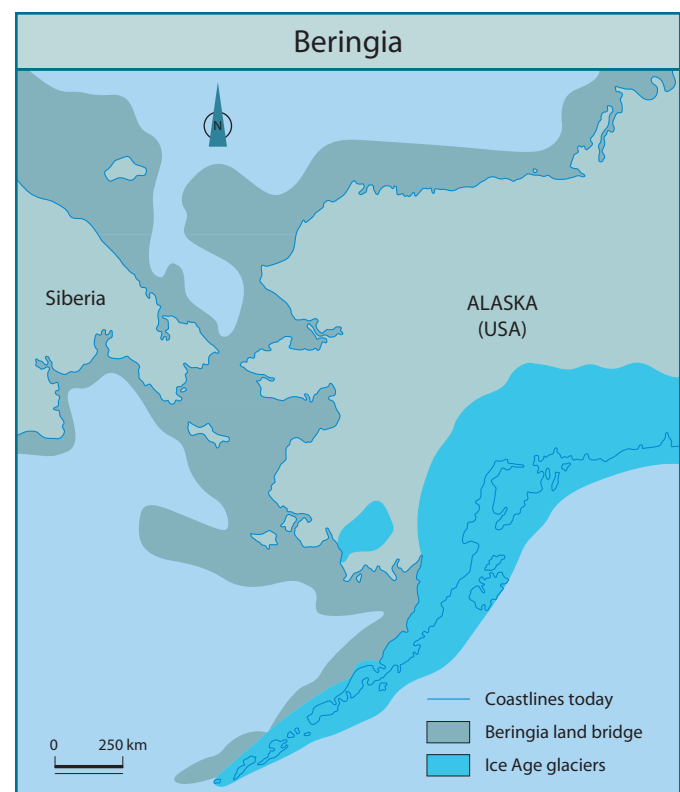
I got a note from Jens today. He is really looking forward to the summer. He has enrolled in sailing lessons at a yacht club. He hopes this will help him become captain of a ship someday. Here is his report.

The Aboriginal Peoples of the Northern Circumpolar World

Early Inhabitants

Scientists generally believe that the Aboriginal people who live in Greenland and North and South America are descendants of people who migrated from northeastern Asia. Aboriginal peoples around the circumpolar world have their own stories of their origins, which often refer to their existence here 'since time began'. The scientific and First Peoples' stories often take different approaches to how we know things, and about what is 'true', and these approaches often pursue different explanations for realities such as the existence of people in this part of the world. In this chapter we are primarily discussing the scientific narrative.

Scientists find compelling evidence for their explanation of how people came to be where they



Some scientists think that the floor of the Bering Strait was above the water about 30 000 years ago, forming a land bridge that connected Asia with North America. This land bridge is called Beringia. Scientists believe that Aboriginal peoples migrated from Asia to new homes in North and South America.

are in the circumpolar world in language and artifacts as well as in DNA.

These kinds of evidence lead them to believe that the first wave of migration began more than 25 000 years ago. One theory that has significant evidence to support it is that people from Siberia crossed the land bridge of Beringia when ocean levels were much lower than they are today. They would have followed land channels south and west of the great continental glacier. In time, they lived throughout what we call North and South America. These first migrants were the forebears of all Aboriginal people here, except the Athapaskan-speaking peoples (this includes the Dene of the NWT) and the Inuit.

Scientists propose that the ancestors of today's Athapaskan-speaking peoples migrated about 15 000 years ago. For the most part, these peoples eventually settled in the subarctic regions in the northwestern part of the North American continent.

The next significant event happened about 10 000 years ago, near the end of the last ice age. People began moving into the most northerly regions of both Europe and Asia, as the continental ice sheets began to melt and recede. The ancestors of the Sami, possibly from southeastern Europe, moved into northern Scandinavia. Other peoples, from east-central Asia, moved northward too. They followed the great rivers that flow through the taiga to the Arctic Ocean. Eventually they settled on the Siberian coast.

More recently, perhaps 4500 years ago, the seafaring peoples of northeastern Siberia crossed the Bering Strait. In succeeding waves, they moved further eastward. They were the ancestors of the Inuit of Alaska, Canada, and Greenland. They arrived in Greenland approximately 1000 years ago. Along the treeline in Alaska and Canada, they encountered other First Peoples who had migrated from Siberia before them.

Way of Life

Archaeological evidence suggests that there were many distinct groups among the First Peoples who migrated into the circumpolar world. Each group had its own leaders, language, customs, and beliefs. Yet, because of the physical environment they had chosen, the groups had similar interests and common lifestyles.

Most importantly, they were all linked closely to the land. Their lives were governed by the seasons and by the activities of the animals they relied upon for food. This close link with the land and its resources determined their lifestyles, where they lived, how they organized, and what they believed about life.

Spiritual Beliefs

Many groups of First Peoples had spiritual beliefs that were similar to each other's and to Aboriginal peoples elsewhere in the world. Many held some belief about a powerful Creator. In addition, most believed that all things in nature (for example, rocks, trees, animals, water, the air, the moon) were living things. Some of these spirits were helpful to human beings, particularly if they were respected and treated properly. Others could harm humans



This drummer is praying at the dawn of a new day. Drums have a spiritual role in Aboriginal societies.

who did not respect appropriate ways of acting and living. The belief that all things have spirits is often called animism.

Believers tried to live in such a way that they increased the helpful power of spirits. They might perform rituals before and after a hunt. They might perform ceremonies over people who were sick, hoping to bring their lives back into balance. Some people carried amulets, or charms, which were symbols of protection and past experiences.

Some individuals were believed to have an extraordinary influence with the spirits. These people were called shamans. It was thought that shamans could communicate with the spirits and influence their actions for good or ill. They were powerful people in society, often respected, and sometimes feared.

The drum played an important spiritual role in most of these Aboriginal societies. The rhythmic power of the drum was used to reinforce the importance of ceremonies. It added drama to storytelling. The circle of the drum bound together the lives, memories, and hopes of the people.

Social Organization

Social organization in many groups of First Peoples held some similarities. They lived in small

groups (a few families together), or a small, self-governing band. Because of relatively sparse vegetation, animals roam over widespread areas of land to find enough food. This meant that humans who relied on the animals moved, too.

As one season passed into another, these groups travelled from one familiar place to another in cyclical patterns of movement and temporary settlement. This lifestyle protected the environment. The people wanted to avoid the destruction of their habitat from over-harvesting its resources. These patterns of movement and temporary settlement varied greatly from band to band, depending upon the resources available to each group.

Each band joined with other bands of their own tribe at pre-determined sites once or twice a year. To celebrate these special occasions, people socialized, told stories, arranged marriages, and traded.

Each family in a band was required to be largely self-reliant and independent. Yet in times of injury, sickness, or scarcity, families helped one another. Each family enjoyed a fair measure of freedom from the control of others. Yet there were rules of conduct that all members of the group were expected to follow. These rules were to guide them in their relationships. For example, it might be generally agreed that no individual or family had the right to prevent others from hunting or fishing in a particular place.

These and other rules for behaviour (called mores) were learned by all children and upheld by community expectations. If an individual behaved in a way that violated these rules, he or she would feel the disapproval of the group. If the violation were serious enough, the offender might be punished.

For very serious violations, offenders might be banished or executed.



This is a traditional Tlicho feast in Canada's Northwest Territories. In the past, some bands of First Peoples would come together and celebrate special occasions.

Economic Activity

The main economic activities of all First Peoples were hunting, fishing, and gathering food or useful things such as moss or driftwood. The land satisfied all needs for food, clothing, shelter, fuel, first-aid, medicine, personal hygiene, utensils, tools, and weapons. Later some groups turned to other work such as herding. They were attempting to develop a more predictable and certain livelihood.

Most often, there was enough food. Occasionally there was an abundance. But once in a while, there was disaster. Sometimes the animals did not follow their usual migration routes. Sometimes, because of disease, or cyclical variance, animal populations declined. Sometimes the weather made hunting difficult. In these times, there was hunger, and sometimes, starvation.

To ensure a food supply, northern hunters developed great skill and patience. Moreover, nothing taken in the hunt was wasted. Eyes, tongue, blood, heart, liver, kidneys, and brain came to be enjoyed as delicacies. Stomach contents and the animal's parasites were also eaten.

People preserved food by drying or freezing, or by tying it into airtight skin bags and letting it age. In times of plenty, they stored fish and meat in caches to which they could return later.

Because land resources were essential to survival, groups of First Peoples sometimes came into conflict with other groups over the control of territories. Conflicts might occur at the margins of traditional lands where the control of territory was not clearly established. As in all other societies, conflict might occur if a group encroached on another's territory to obtain scarce resources.

Technology

Besides similar spiritual beliefs, social organization, and economic pursuits, various groups of First Peoples had somewhat similar technology. They applied their ingenuity to the available raw materials and developed very efficient technologies.

Because they had access to different raw materials, though, there were significant differences in technology from group to group. These differences were very great between the peoples of the



The First Peoples dried fish and stored them in caches for the winter.

Traditional Use of Whale in the Arctic

- food, such as meat, organs, muktuk
- meat and fat for dog food
- liver and lungs for drum heads
- oil for heating, cooking, lighting
- bones for house frames, rafters, burial cairns, caches, sled runners, boat ribs, picks, shovels, shafts, lance and harpoon heads, knives, snow beaters, paddle blades
- baleen for toys, platform matting, lashing, traps, fishing line, nets.

Arctic and the Subarctic. In this sense, the treeline formed a significant cultural boundary.

Traditional Use of Wood in the Subarctic

- poles for tent frames and brush shelters, shafts, spears, bows, and arrows
- spruce boughs for bedding
- logs for fish traps, food caches, and fuel
- willow bark for fish nets
- trees for anchoring snares
- birch fungus for tinder
- wood for the handles of awls, axes, ice chisels, fish net floats, ice scoops, fuel, snowshoe frames, drums, rattles, toboggans, canoe frames
- birch or spruce bark for canoe covers
- birch bark for a variety of utensils such as cooking, storage, and carrying pots and baskets
- birch sap for syrup
- spruce roots for thread and twine
- spruce gum for gluing and waterproofing canoes and pots
- roots and bark for medicine

In general, circumpolar peoples used the best materials available to construct shelters suitable to their mobile lifestyle. The shelters were supported by wooden poles, whale bones, or drift wood. Walls and roofs were made of sod, stone, or hides. Or, the entire structure might be constructed with blocks of hard-packed snow.

Furs and tanned hides made warm, waterproof clothing. People used bone needles and sinew thread. They made rope from roots or hide. They chiselled stone, bone, and antler to make tools and weapons. They worked soft stone to shape utensils and sewed skins to make carrying cases. Dogs



This woman is making birch bark baskets.

helped carry and pull their loads. Birch bark or animal skins made light, streamlined boats.

Education

Education of the young was a family affair. Through daily example, parents and grandparents taught children what they needed to know to live effectively in their society. Some elements of education were the same for all children—learning spiritual beliefs and standards of acceptable behaviour, for example. In some matters, education for boys and girls was different. Among other things, boys learned to hunt and fish. Girls learned to prepare



This caribou hunter is wearing a coat made from furs and his sled is made of wood. These are examples of technologies developed by the First Peoples.



This young Greenlander is wearing a traditional costume. Parents and grandparents in the past and today teach children how to live effectively in their society.

food and process skins for clothing and shelters. By their mid-teen years, young people were expected to make significant contributions to the welfare of the group. See *Dene Kede* for a fuller description of these roles and practices.

Conclusion

The First Peoples of the circumpolar regions experienced many challenges. They risked starvation, a difficult climate, life-threatening accidents, and animal attacks. Yet they adapted to the land they lived in, and found time for enjoyment.. They had strong family bonds and developed rich cultures. They sang, played, danced, and told stories. They carved imaginative figures of wood, bone, stone, and ivory and made attractive amulets and ornaments. Sometimes the women decorated baskets and clothing with tassels, fringes, and insets of contrasting fur that were works of art.

Today

There have been very big changes in the lifestyles of today's descendants of the circumpolar world's First Peoples. While some follow elements of a traditional lifestyle, many do not. However, the bond with the land or the sea is still seen today. It can be seen in the continuing enjoyment of country food. It can be seen in the desire of many to spend time on the land. It can be seen in the desire of groups to regain control of their traditional lands, through treaties, land claims, economic develop policies and land-use agreements It can be

seen in their concern about the impact of industrial development and pollution on the sea, the land, plants, animals, and human life. It can also be seen in the education system. Many countries had seen the development of residential schools - which often strove to eliminate Aboriginal languages and

cultures. In many places in the circumpolar world today, we are seeing the re-emergence of traditional arts, language, and stories within schools and programmes of study.

Today, the descendants of the first northern peoples live throughout the circumpolar world. They live in northern Norway, Sweden, Finland, Russia, and Canada, as well as Alaska and Greenland. Except for a very small number of individuals, they do not inhabit Iceland or continental Denmark.

The Arctic today is culturally, politically, demographically and economically diverse, with settlements ranging from small communities to modern industrial cities. Indigenous Peoples live in all of these settlements. There are over 4 million descendants of First Peoples out of the total population of approximately 10 million people who live within the boundaries of the circumpolar world .



Rhoda Veevee at Inuvik Arts Festival weaving on frame loom.



Many descendants of the First Peoples practise traditional arts. This artist, Mary Okheena, is making prints that show the traditional way of life in Canada's North.

SEARCH

Document the presence of Aboriginal populations in your region. Note the general names of the groups and the names of smaller sub-groups or bands. Note their population, language, and traditional lands.

IMAGINE

Imagine that you are an Aboriginal Elder. You want to ensure that the youth in the circumpolar world understand some of the changes that have occurred over time and the impact these changes have had on the First Nations way of life. You must determine the most significant historical change that has occurred since European migration to the circumpolar world. Once you have determined the cause of the most significant change, use a poster to illustrate the before and after of this change. Divide your paper in half. On one side, show what life was like before this change occurred. On the other side, demonstrate the impact of this change on the First Nations way of life.

ASK ELDERS

With the assistance of elders, prepare a list of traditional foods eaten in your region. Create a second list of traditional foods that are no longer generally eaten. Explain why.

OUTDOOR LAB

Look for elements of traditional Aboriginal technology still in use in your community. Note the cases in which the technology is still traditional in every sense. Also note the cases in which the basic ideas underlying technologies are still in use, but where other materials have been used to implement the designs.

WEB LINKS

eLibrary

Address: <http://elibrary.bigchalk.com/libweb/canada/do/login>
NWT access - Username: govont0201 Password: elca

CultureGrams

Address: <http://online.culturegrams.com/>
NWT access - Username: govnorthwest Password: welcome

First Peoples

<http://www.civilization.ca/cmc/exhibitions/aborig/fp/fpint01e.shtml>

The Canadian Atlas Online

<http://www.canadiangeographic.ca/atlas/themes.aspx?id=first&lang=En>

Links to Circumpolar Indigenous Peoples sites

http://www.google.com/Top/Regional/Europe/Russia/Society_and_Culture/Ethnicity/Arctic_and_Siberian/

European Migrations

CHAPTER 17

May 3

A long letter arrived today with Fjola's report. She's inviting me to return to Iceland for a visit. I wrote back immediately and told her, "No problem. I'm saving my pennies. I should arrive sometime after the turn of the century." Here's her report.

Migrations of Europeans to the Circumpolar World

Archaeological and historical evidence indicates that the ancestors of today's Scandinavians began moving into their present territories following the last ice age. This settlement occurred at about the same time that the Sami were moving north, about 10 000 years ago.

Pytheas, a Greek geographer and astronomer living in Gaul, attempted to learn more about the northern world. He left southern France in a galley around 320 BCE. Reports indicate that he visited Britain and claimed to have sailed to an island six days north of Scotland. Eventually he came to a "congealed sea" and a place where the summer sun never set. Most people did not believe his reports. They made fun of him because they thought that the North was a frigid, uninhabitable zone.

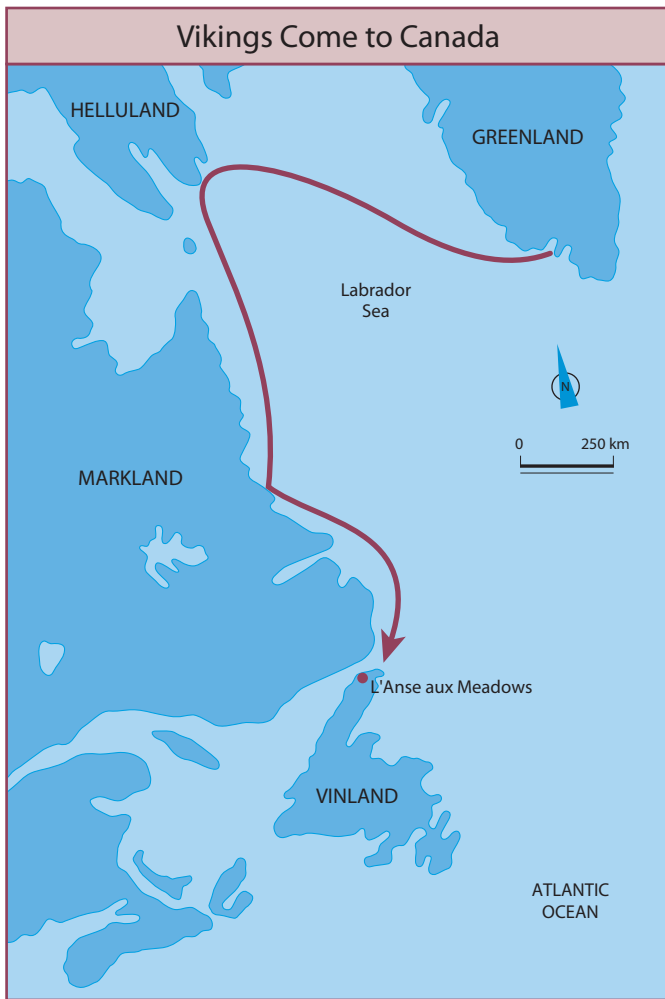
Legend says that centuries later Irish hermit monks sailed across the Atlantic Ocean looking for solitude. They may have visited Iceland and Greenland before 600 CE. One of these monks was St. Brendan, the abbot of an Irish monastery. He is a legendary navigator-hero.

Vikings

Viking sagas tell us that Scandinavian adventurers visited Iceland and Greenland before the end of the first millennium. Viking families from Norway and the colonies in Britain settled in Iceland in 870 CE. From the mountain tops of western Iceland, these colonists could dimly see another island to the west. Around 983 CE, Erik the Red led a group of settlers from Iceland to this other island, which he named Greenland.

According to the sagas, Erik's and Tjodhild's son, Leif Eriksson, and others from Greenland and Iceland may have visited Baffin Island (Helluland) and Labrador (Markland), around 1000 CE. They began a colony in Newfoundland. Remains of a Viking settlement have been found at L'Anse-aux-Meadows on the north shore of Newfoundland.

The Viking colonies in Iceland became permanent settlements, but in Canada and Greenland they eventually disappeared. The Canadian colonies seem to have collapsed fairly



Erik the Red and Leif Eriksson may have travelled from Greenland to Baffin Island (Helluland), Labrador (Markland), and Newfoundland (Vinland), which now are part of Canada.

quickly, perhaps because of conflicts with First Peoples.

There was a significant cooling of the earth's climate from 1300 to 1500 CE. The Norse in Greenland, who relied on agriculture for survival, could not adapt to a climate where even hardy grains could not be harvested.

On top of that difficulty, Greenlandic trade with Scandinavia was being eroded. The Greenlanders had served as "go-betweens" for the Scandinavians and the Inuit. They traded smelted iron, bronze, and copper to the Inuit in exchange for polar bear skins, walrus ivory, and narwhal tusks. Because winters became more harsh, and perhaps because of difficult relations with the Inuit, trade goods were in short supply. Moreover, fur



These are the remains of a Viking settlement at L'Anse-aux-Meadows in Newfoundland. The settlement did not survive, likely because of conflict with the First Peoples there.

and ivory were becoming available to Europeans from arctic Eurasia. For all of these reasons, the colonies in Greenland collapsed around 1400 CE.

Scandinavians eventually returned to Greenland. Hans Egede, a Norwegian missionary, started a Lutheran mission in 1721, and founded the colony of Godthaab (now called Nuuk). A few years later, the Danes returned and re-established control of the island.

Whalers

The first European whalers may have been Norwegian. In Norway, rock carvings thousands of years old show people hunting whales from canoes. The most prominent European whalers for many centuries were Basque.

The Basque people live along the Bay of Biscay, overlapping the border between France and Spain. In the 900s CE, Basque whalers hunted from small open boats. By the thirteenth century they had made whaling a big industry. They hunted from large sailing ships that carried smaller whaling boats on board. Their whaling expeditions covered great distances, possibly reaching Iceland and Canada.

Explorers and Traders in the Northwest

Following Christopher Columbus' voyage to America in 1492, many European sailors embarked on journeys of exploration. They wanted to learn more about the world. They wanted to find and claim new lands for the people sponsoring their expeditions. They were also searching for a shorter route to the Far East, where rich trade prospects beckoned them.

Martin Frobisher made three voyages from England to what is now called Baffin Island between 1576 and 1578. During his last two voyages he dug up tonnes of earth, thinking he had discovered gold. He hadn't. During his second

expedition, his crew had a violent encounter with Inuit.

Another Englishman, John Davys, set out to find the Northwest Passage on three voyages between 1585 and 1587. Unlike the swashbuckling Frobisher, Davys was a scholar and explorer. He is sometimes called the "father of arctic discovery." He brought Davis Strait to world attention and wrote books for seamen on nautical matters such as currents and ice floes.

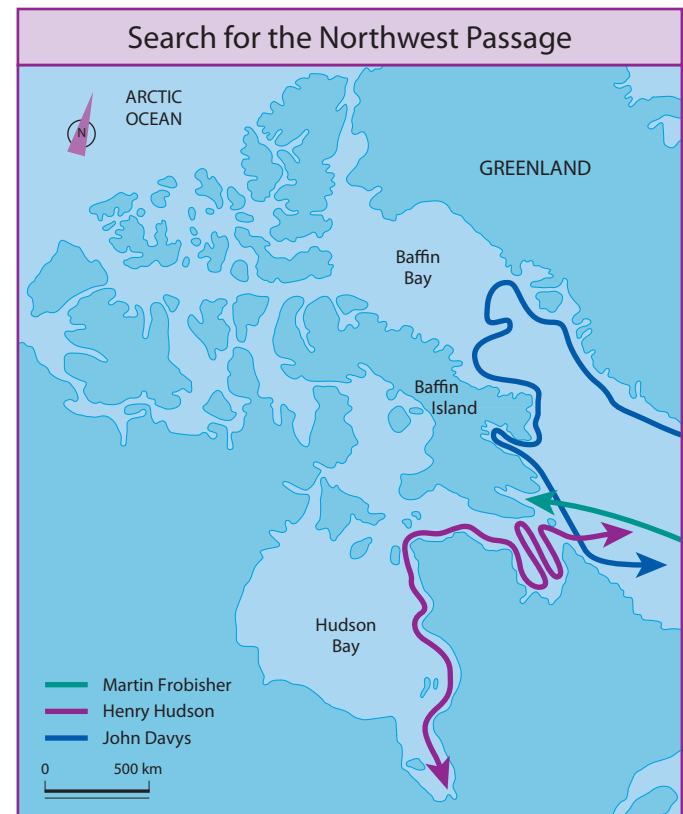
Englishman Henry Hudson sailed the

WHALING

By the end of the seventeenth century Dutch, English, French, and German whalers had learned the Basque methods of whaling, including the processing of whales on board ship. These Europeans pursued whales, particularly right whales, along the edge of the Arctic and North Atlantic Oceans all the way from Spitzbergen to Davis Strait. During the nineteenth century Americans began whaling too.

In season, scores of whaling ships from many countries could be seen north of Norway, in Disco Bay, Greenland, or around Herschel Island in the Beaufort Sea. These whalers made frequent contact with First Peoples who lived along the coasts. Contact changed the lives of the northern coastal peoples.

The technology of whaling changed with the Norwegian invention of a cannon-fired harpoon. This, along with increasing numbers of whalers, meant that some species were hunted to near-extinction. The slaughter began to slow down with the birth of the petroleum industry in 1859. Kerosene began to replace whale oil as a source of fuel for lamps. Soon the era of the great whaling fleets ended.



This map shows the routes that three explorers took in their search for the Northwest Passage in Canada's North.

Hope-well into arctic waters north of Scandinavia in 1607 and 1608 when he was working for the Muscovy Company. He noted the good fishing grounds, and reported the presence of bowhead whales near Svalbard.

In 1610, Hudson sailed *Discovery* to North America and into what is now called Hudson Strait and Hudson Bay. This established a British claim to the region. Hudson wintered on the shore of

what is now called Rupert Bay. Some of his men died.

The following summer Hudson renewed his search for a westward passage to the Pacific. Discouraged, discontented with Hudson's leadership, and fearful of what they thought was his reckless determination, some of the ship's crew mutinied. They forced Hudson, his son John, and seven crew members into a small boat and cast them adrift. They were never seen again.

Another Englishman, William Baffin, was also searching for the elusive Northwest Passage. He explored the coasts of north Baffin Island and Ellesmere Island. He saw and named Lancaster Sound but did not enter it. We now know that Lancaster Sound is the eastern entrance to the Northwest Passage.

In 1619, Jens Munk from Denmark sailed to Hudson Bay looking for the Passage. His expedition wintered at the mouth of what is now called the Churchill River. Cold temperatures and sickness took their toll. Only three men, including Munk, made it back to Copenhagen the following year.

All the interest in the North made Europeans aware of the region's economic potential, particularly for valuable furs. To take advantage of this, Prince Rupert and his business associates established the Hudson's Bay Company in England in 1670.



Hudson Strait and Hudson Bay are named after Henry Hudson because of his expedition in 1610-1611.

The Company built fortified trading posts at various key locations on the shore of the Hudson Bay. European employees at these posts carried on a relatively peaceful trade with the Chipewyan and Cree who lived nearby. The employees often cohabited with Aboriginal women, who cooked, sewed, and cleaned for them. The traders exchanged goods such as muskets, hatchets, knives, copper pots, awls, needles, steel fish hooks, looking glasses, and trinkets for fur pelts, particularly beaver.

The fur trade brought changes to the First Peoples' lives. They added commercial trapping to their economic activities, as a supplement to hunting, fishing, and gathering, although it must be said that the Cree had earlier traded furs to the Huron in exchange for corn. The First Peoples began to change their patterns of seasonal movements. They began to rely on certain European technologies, such as guns and traps, for their survival, and commodities such as tea for their pleasure. This made the trading post an important part of their lives. Traders also brought new diseases. Eventually, when the fur trade became very competitive, traders introduced alcohol to the First Peoples.

Change occurred in the other direction as well. Europeans found elements of the First Peoples' technology very helpful for living comfortably in the new world. They learned to build



The traders for the Hudson's Bay Company traded goods for beaver pelts.

and use canoes. They learned to use snowshoes and toboggans and to use animal skins for their clothing. They learned to use Aboriginal health remedies.

With trade actively underway, new movements of Europeans began in the northern part of North America. Samuel Hearne was an English seaman and explorer employed by the Hudson's Bay Company. In 1772, he made a journey overland from Fort Prince of Wales on Hudson Bay to the Arctic Ocean near Coppermine (Kugluktuk).

Alexander Mackenzie, a Scottish trader, was a partner in the North West Company. This company built forts in the interior of Canada's Northwest. It employed French Canadian **voyageurs** to make long canoe journeys to trade with First Peoples on their home grounds.

Mackenzie wanted to find more efficient canoe routes. In 1789, he led an expedition out of Fort Chipewyan, hoping he would find a good trade route to the Pacific Ocean. Instead, the river system he followed led him to the shore of the Arctic Ocean. In 1793, he led a second canoe flotilla on a difficult journey to the Pacific Ocean. This journey showed him there was no easy canoe route to the Pacific through northern Canada.



The Europeans found the technology of the First Peoples to be useful, like the canoe. This is a replica of the kind of canoe that the early fur traders would have used.

James Cook was an officer in the British Navy. In 1778 he travelled up the west coast of North America, charting the coastal waters of what are now called British Columbia and Alaska. He also explored the region of the Bering Strait.

The journeys of Hearne, Cook, and Mackenzie proved that there was no easy ocean passage from the North Atlantic to the Pacific Ocean. Traders still had to take the long trip around Cape Horn. Nevertheless, interest in a Northwest Passage remained. Arctic explorations by Europeans became even more frequent. There were expeditions by British explorers John Franklin, George Back and John Rae, and the American Charles Francis Hall. Franklin lost two ships, the *Erebus* and *Terror*. He died with 129



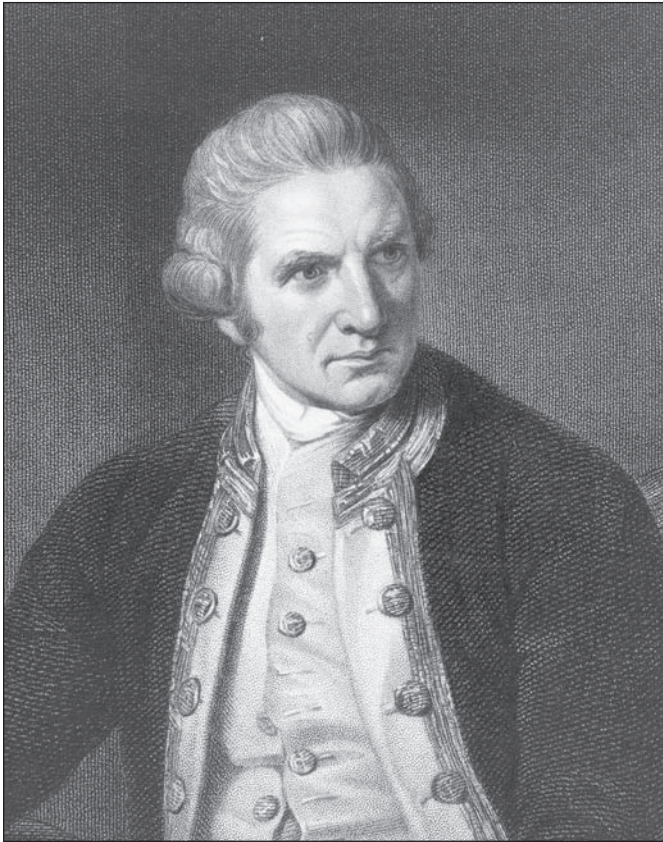
Alexander Mackenzie was a partner in the North West Company, a competitor of the Hudson's Bay Company.

crewmen in a search for the Passage that began in 1845. In following years, many other expeditions travelled into the North looking for the remains of Franklin's expedition. They advanced general knowledge about the circumpolar world.

Roald Amundsen, a Norwegian, was the first to complete a journey through the Northwest Passage on a single vessel. He sailed the *Gjoa* through the Northwest Passage from east to west from 1903 to 1905.

Explorers and Traders in the Northeast

Europeans were interested in the Arctic Ocean north of the Eurasian continent also. As early as the sixteenth century there were summer fishing expeditions near Svalbard and Novaya Zemlya. Dutch and Russian expeditions also went into the region hunting polar bear and arctic fox.



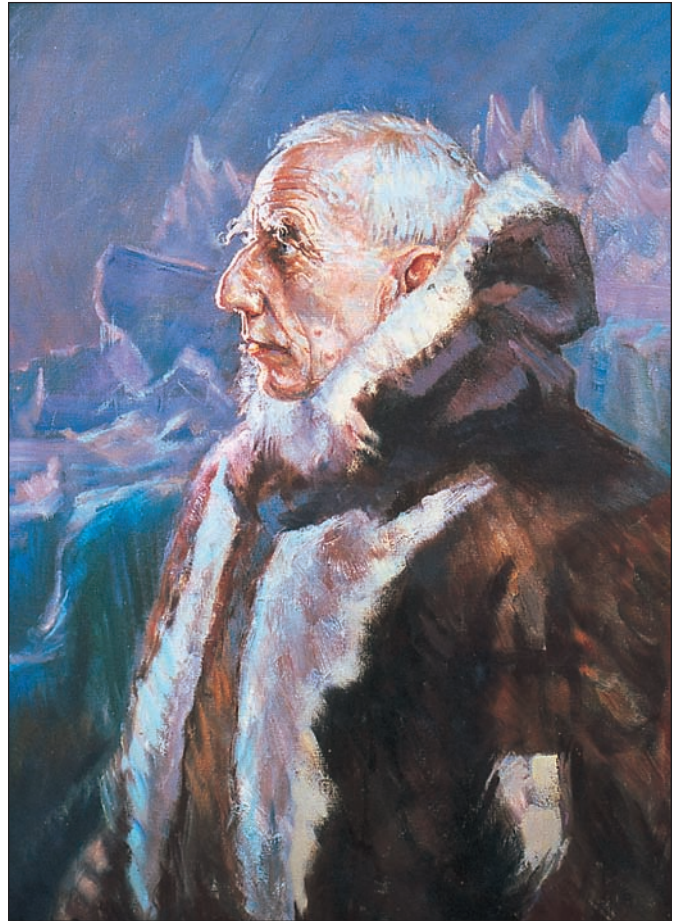
James Cook charted the coastal waters of what is now called British Columbia and Alaska.

Sometimes by accident, and sometimes by design, expeditions over-wintered in the Arctic. For example, in 1553 an English expedition headed by Hugh Willoughby was trapped in the ice of the Arzina River in Russian Lapland. Unprepared for this event, all 70 crewmen died during the winter.

In 1596, Dutchman Willem Barents and his crew, searching for a **Northeast Passage** to Asia, became trapped in the ice. They spent the winter on Novaya Zemlya. They built a crude house and warmed themselves by burning driftwood. They ate foxes and polar bears. Barents died on the return journey the following spring. Twelve of seventeen men survived. In 1633-34, seven

Dutchmen from another expedition volunteered to remain on Svalbard during the winter. They survived the first winter, but when they volunteered to remain a second winter, they died of scurvy.

In the sixteenth century Russians became interested in the vast land north and east of them, Siberia. Under the sponsorship of the wealthy Stroganov family, a band of Russian frontiersmen, called kossaks, crossed the Ural Mountains in 1581. The army of less than 1000 was led by Vasily Timofeyevich. The kossaks were heavily



Roald Amundsen was the first person to complete a journey through the Northwest Passage.

outnumbered by the Tartars. (Tartars lived east of the Urals in *Sibir*, "the sleeping land.") But with military skill and up-to-date military equipment, the kossaks defeated the Tartars and captured Isker, their capital.

The Aboriginal peoples in Siberia, who had earlier been forced to pay tribute to the Tartar Khan, were now forced to pay the kossaks. The

GETTING EXPERT HELP

Explorers often relied on Aboriginal people to help ensure the success of their explorations. They hired Aboriginal people as interpreters, guides, and providers of food. The explorers commonly paid them for their services with guns, ammunition, tobacco, blankets, or cloth.

In his journal, Samuel Hearne acknowledged his great indebtedness to Matonabee, whom he described as punctual in performance of a promise, scrupulous in adherence to truth and honesty, courageous, and magnanimous. Hearne failed in his first attempt to trek across the barrenlands. It was only after he engaged Matonabee to accompany him that he succeeded. Matonabee had convinced him that the trek could not be made successfully without Chipewyan women along to do the important work that Aboriginal women traditionally did on the land—especially to carry supplies, to make and repair clothing, and to gather and prepare food.



Samuel Hearne was a seaman and explorer employed by the Hudson's Bay Company. He relied on Matonabee's expertise.

Alexander Mackenzie engaged Aw gee nah, also known as English Chief, as his guide when he made his famous canoe voyage down the Deh Cho (Mackenzie River) in 1789. Aw gee nah had earlier been to the Coppermine River with Hearne and Matonabee. Besides the North West Company's canoemen, the expedition included other young Chipewyan hunters and their wives.

John Franklin's expedition from Great Slave Lake to the coast of the Arctic Ocean in 1821 nearly ended in disaster. He and some of his men were near death from starvation. They were saved when Boudelkell and other young Yellow Knives arrived with dried meat, fat, and a few caribou tongues. They had been sent by Akaitcho, a Yellow Knives chief. Franklin said, "We gradually continued to improve under the kindness and attention of our Indians." George Back, who was part of Franklin's expedition, described Akaitcho as being "generous and humane."

Dr. John Rae credited his remarkable success in arctic travels to the fact that he learned from Aboriginal people how to hunt, dress, and make shelters, thus relying on the land for survival rather than imported supplies. He recommended this approach to other arctic adventurers. On his trip to the coast of the Arctic Ocean north of Repulse Bay in 1846-47, he engaged Ouligbuck, an Inuk he had earlier befriended, as his guide and interpreter. Ouligbuck and his son were very useful in helping Rae to gather information about the Franklin expedition.

Charles Francis Hall met and befriended two Inuit, Ipilvik and Tukkolertuk, also known as Joe and Hannah, on his first trip to northern Hudson Bay in 1860. He engaged them to accompany him on an expedition north of Hudson Bay from 1864-69. He hired them once again when he sailed into northern waters on the *Polaris* in 1871. Hall died on this trip and his ship then ran into difficulties. The arctic land skills of the two Inuit eventually saved the ship's crew from disaster when they abandoned their vessel after it hit an ice floe.



Niels Adolf Erik Nordenskjöld was the first European to sail completely through the Northeast Passage, in 1878-1879.



Dr. John Rae - who discovered the final piece of the Northwest Passage and the terrible fate of Franklin's expedition

Dr. John Rae

John Rae was a doctor and adventurer from the wind-swept Orkney Islands at the northern tip of Scotland. Working for the Hudson's Bay Company, John Rae travelled successfully over more of the Canadian Arctic than any other European.

The methods that Rae used to travel came in part from the fact that Hudson's Bay men lived in the Canadian North all year long. Rae spent his early time in Canada at Moose Factory in the south of Hudson's Bay. It was here that Rae learned to shoot, hunt, paddle, walk on snowshoes and listen to the local Aboriginal people to find out how to survive.

Instead of huge expeditions on giant ships, the HBC often sent men like John Rae on smaller expeditions. Rae usually travelled with a small group of men who knew the North and were comfortable travelling, hunting, walking, paddling, and camping.

Instead of wintering in huge boats in the ice, Rae would camp Inuit style. He would construct snow houses and hunt for his food. He would carry only the food that would get him to his destination. After that, he would rely on his skills as a hunter to feed the party. He also shaped the routing and timing of his voyages to match movements of game animals, ice and weather, as suggested by the Aboriginal people of the area. In this way, Rae travelled through more of the Arctic than any other European.

Rae was criticized for using Aboriginal travelling techniques, clothing and diet. A fierce public campaign was waged against him when he brought back the news that members of the Franklin expedition may have eaten their fallen shipmates. Rae had received this information from several Inuit hunters who had proof of the fate of the expedition, and related what they had seen, including the desperate efforts of those who survived longer than others. Rae's reputation was severely damaged as a result of having believed, and standing by, the accounts of Inuit concerning behaviour considered impossible by British navy men. His exploration provided the final link in a navigable Northwest Passage - but remains a little recognized fact even today.

tribute included luxurious pelts of sable, black fox, and beaver. This booty pleased Tsar Ivan the Terrible in Moscow. He began looking eastward to build his Russian empire, just as the monarchs of other European nations were looking westward across the sea.

Within two decades, the “colourless hordes,” as the First Peoples called the white-skinned Russians, had much of western Siberia under their control. By 1639 the Russians had reached the Pacific. They then set about consolidating their control over the whole of Siberia, even to the shores of the Arctic Ocean.

Danish navigator Vitus Bering explored the Bering Sea coasts in 1728 for the Russian government. On another journey in 1741, Bering sighted Alaska and claimed it for Russia. Bering died on that voyage. His crew returned from its last expedition with valuable sea-otter pelts. Soon Russians were trapping and trading in the Aleutian Islands. In 1784 Grigory Shelekhov established a permanent Russian settlement on Kodiak Island.

By the end of the century the Russian government had asserted its authority in Alaska. The Russian monarch, Tsar Paul I, granted a charter to the Russian-American Trading Company. Like the Hudson’s Bay Company in Canada, this company was given a monopoly on trading rights. It also was given the right to govern the region. A Siberian fur trader, Aleksandr Baranov, was the company’s first governor. In trying to settle the region, he encouraged European men to marry Aboriginal women.

Finding trade routes through the northeast and the northwest passages captured the imagination of Europeans. There was interest in proving that a sea route north of the Eurasian continent was manageable, useful, and profitable. The first European to sail completely through the Northeast Passage was a Swede named Niels Adolf Erik Nordenskjöld. In 1878-1879, he and his crew sailed the *Vega* from the Atlantic to the Pacific. Before this, Nordenskjöld had acquired experience by visiting Greenland and by attempting (unsuccessfully) to reach the North Pole.

Today, Russia is promoting the Northeast Passage as a better trade route than more southerly routes for shipping goods from western Europe to the Far East. The Northeast Passage is cheaper and potentially faster, but heavy ice makes schedules uncertain. Critics of this promotion fear there will be environmental disaster if supertankers carrying oil begin using the route regularly.

Recent Developments

Near the end of the twentieth century, Alaskan and Yukon gold rushes brought large numbers of people of European origin to the North. First Peoples and the citizens of powerful nation-states were beginning to converge in significant numbers. By the middle of the twentieth century there were large movements of European peoples to the circumpolar world both in Siberia and North America. They travelled there because the North had largely been de-mystified for southerners, because there were jobs, and because there was safe, reliable transportation available.

People were drawn by business and employment opportunities in trade, transportation, construction, and mineral development. Some were sent by churches to serve as missionaries. Many moved north as a result of government initiatives. As police and administrators, they helped to establish government control in the circumpolar regions. As teachers, nurses, social workers, and housing specialists, they moved north to deliver government programs. Military personnel moved to assert national sovereignty and to secure the nation’s borders.

Many people from southern areas who travelled north to work left as soon as their terms of duty ended. But many others liked it and stayed. Today in the circumpolar world the descendants of First Peoples commonly live side by side with people of European origin. Indeed, in Scandinavia and Canada, people from throughout the world now live in the North, too.

SOME NORTHERN CIRCUMPOLAR FIRSTS

Salomon Andree

In 1897 Salomon Andree, and two companions, all Swedes, attempted to fly to the North Pole in a balloon from Spitzbergen Island. Their balloon was forced to land on the frozen Arctic Ocean after three days of flight. Their remains were found on White Island in 1930.

Fridtjof Nansen

In 1888 a Norwegian, Fridtjof Nansen, crossed the Greenland icecap. From 1893 to 1896, Nansen allowed his specially constructed boat, the *Fram*, to get locked into the ice of the Arctic Ocean north of Siberia. He drifted with 13 crewmen, slowly following the ocean's currents and conducting scientific studies.

Robert Peary

American naval officer Robert Peary is generally credited with being the first to reach the North Pole. Accompanied by Egingwah, Ootah, Ooqueah, and Seegloo, sled drivers and hunters, and by Matthew Henson, a black companion, Peary claimed to have reached the Pole on April 6, 1909. Although he was certainly close to the Pole, many skeptics do not believe he actually reached it.



*Fridtjof Nansen
crossed the
Greenland
icecap in
1888.*

Knud Rasmussen

Knud Rasmussen, a Greenlander whose mother was descended from the Inuit, and whose father was a Danish missionary, conducted his famous Fifth Thule Expedition from 1921 to 1924. This was his journey from Greenland to Alaska, across Baffin Island and Canada's Arctic coast. During his travels, Rasmussen studied and recorded the folk-lore, customs, and culture of the Inuit. His descriptions were valuable because soon after the journey, major social changes occurred in the lives of the Inuit.

Nautilus Sails under the Icepack

The American submarine *Nautilus* sailed about 3000 kilometres underneath the arctic icepack from the Pacific Ocean to the Atlantic Ocean in 1958.

Arktika Sails to the Pole

The first vessel to sail to the North Pole through the ice was the Russian ice-breaker *Arktika* in 1977. Two other ice-breakers, the Canadian *Louis St. Laurent* and the American *Polar Sea*, made the trip together in the summer of 1994. The scientists on board gathered data about the ocean and the arctic icepack.

Richard Byrd

Richard Byrd, an American, was the first to fly over the North Pole in May, 1926. A few days later an Italian-built dirigible accomplished the same feat. Its crew included Roald Amundsen, a Norwegian, Lincoln Ellsworth, an American, and the Italian pilot, Umberto Nobile. They travelled from Spitzbergen Island to Alaska in two days.

Russian Ice Station

In 1937 Russians landed an airplane on skis on the frozen Arctic Ocean. They established their first semi-permanent ice station for scientific research.



Icebreakers are ships that can plow through the arctic sea ice.

PORTRAITS

(pgs 164 - 168) – These portraits and photos were created by European artists/photographers to present these explorers as heroes in Europe. Can you identify features in these paintings/photos that support this hero stereotype? How might these men have been viewed by the Aboriginal people they encountered on their journeys? Redraw one of these explorers from an Aboriginal perspective.



Some people from southern areas travel north to work. Some leave when their work is done. Others decide to live up north.

THINK

What changes in human values, customs, and technology served to relieve pressure on whale populations? Are whales now safe from human predation? Explain your answer.

SEARCH

Imagine that you live in Viking colony in Iceland, Greenland, or Canada at around 1000 CE. Write a journal entry that describes what life is like for you in your community.

SEARCH

At the time of first contact, what did the European newcomers and First Nations peoples learn from each other in the circumpolar world? Write two accounts of this exchange of knowledge; one from an Aboriginal perspective, and one from the perspective of a European newcomer.

SEARCH

Detail the ways in which the European newcomers came to rely upon the descendants of First Peoples in the circumpolar world.

Web-based Resources

eLibrary (password protected)

<http://elibrary.bigchalk.com/libweb/canada/do/login>

NWT access - Username: govont0201 Password: elca

CultureGrams (password protected)

<http://online.culturegrams.com/>

NWT access - Username: govnorthwest Password: welcome

NOVA: The Vikings

<http://www.pbs.org/wgbh/nova/vikings/>

Passageways: True Tale of Adventure for Young Explorers

<http://www.collectionscanada.gc.ca/explorers/kids/h3-1800-e.html>

Explorers of Canada

http://en.wikipedia.org/wiki/Category:Explorers_of_Canada

The North Today

CHAPTER 18

May 4

Reino's report arrived today. He says he was selected to participate in a developmental program for soccer players. He'll spend most of his summer at a training camp. He hopes to win a place on the Finnish national team some day. He's an excellent athlete. I won't be surprised if he makes it.

The Lifestyle of Today's Circumpolar Peoples

In the past 100 years, great social changes have occurred in the northern circumpolar world. A century ago much of the region was a sparsely populated habitat where descendants of First Peoples quietly lived their lives. They lived close to nature, relatively undisturbed by the world to the south. Today, the region is the home of active communities very much in touch with the rest of the world.

Social changes in the circumpolar world have been caused by an inflow of new people, ideas, values, technologies, governments, and laws. These may be called the agents of change.

People, mostly of European origin, have streamed into the circumpolar world. They are now the majority population in much



Technology, transportation, and people bring the northern circumpolar world in touch with the rest of the world.

of the circumpolar world. The descendants of First Peoples are still the majority in Greenland, the more remote parts of northern Russia, and the eastern part of northern Canada.

New people have brought different ideas about social organization, religion, and earning a living. They have introduced new concepts such as land ownership, **merchandising**, job specialization, and large-scale production. They have introduced new values such as **individualism** and **materialism**. They have introduced new technologies ranging from relatively small items to aid hunting and

fishing, to complex equipment that enables rapid, long-distance transportation, and mass communication. They have introduced different governments and laws.

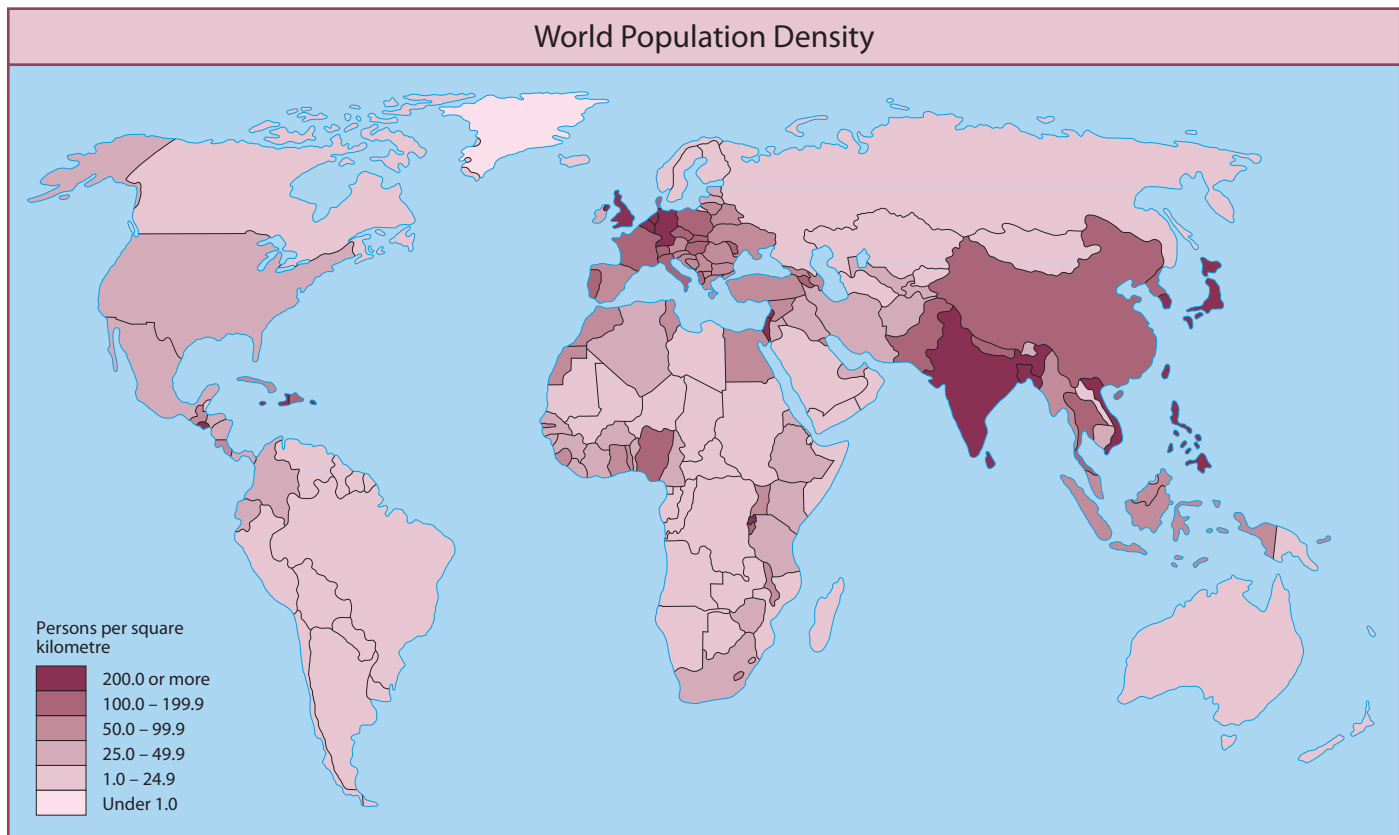
New or different is not always better. New things that provide positive benefit can have serious negative impacts too. Changes are perhaps best judged by those who are experiencing them. Like elsewhere, the peoples of the circumpolar world have embraced some changes, accepted others reluctantly, and rejected still others.

The combination of European and First Nations lifestyles has resulted in a unique way of life in much of the circumpolar world. It reflects both the richness that can result from the convergence of two or more cultures, and the problems that can result as well. It is a lifestyle that is common to the various nations of the circumpolar world, despite differences

in their languages and many aspects of their cultures. This is because their common physical environment generates common needs and presents common opportunities.

Large and Small Communities

The unique northern lifestyle is not easily observed in large communities. In cities and larger towns, the lifestyle is much the same as in larger centres in other parts of the world. There are hospitals, schools, colleges, cinemas, theatres, restaurants, recreation centres, motor vehicles, and traffic lights. There are apartment buildings and office buildings. People travel to and from their homes and jobs every day. Apart from the obvious differences in language, culture, and architecture, services in one city are much like in another.



Population density is determined by dividing the total population of a region by the total area. A high population density means a large number of people are living in a relatively small space. Which regions of the world have the highest population density? Describe the population density of the northern circumpolar world.

In smaller communities the distinctive northern lifestyle is more likely to be observed. In these communities, local Aboriginal languages are likely still spoken, and are often used in daily commerce. In these communities, elements of the traditional culture of the region—clothing, food, entertainment, technology—are also likely in common usage. And one is likely to see evidence that local people are still engaged in hunting, fishing, and trapping.

Food, Clothing, and Shelter

Processed and fresh food is available in stores in most northern communities. If fresh fruits and vegetables are available, they are likely to be very expensive. Because of soil and climate limitations, little fresh food is grown in the circumpolar world. It is flown in.

Despite the inclusion of store-bought foods in their diets, Aboriginal peoples in the circumpolar world often rely on country food for an important part of their nutrition. They eat caribou, reindeer meat or some other venison, fish, seal, or muktuk. Unfortunately, like everywhere else, junk food is also available.

Winter clothing in circumpolar regions reflects Aboriginal designs. The parka is widely worn in winter, modified in design and decorated to reflect local tastes. Today parkas are often made of duffel, stroud, and tightly woven cottons. Fur is still commonly used for trimming parkas. In summer, factory-made casual clothing such as jackets, tee shirts, and jeans are most likely worn.

Many people still wear traditional moose hide mukluks, moccasins, or seal-skin kamiks because they are warm and comfortable. For the same reason, skin and fur garments may

still be worn for traditional activities such as hunting or sealing.

Few people follow a mobile lifestyle today. Most live in communities. Most live in housing much like that in other parts of their nation. Some homes in the Subarctic are heated by wood stoves. In the Arctic, homes are most often heated by furnaces that run on fuel oil. Homes are generally lighted by electricity and contain a variety of electrical appliances. Traditional shelters such as tents or snowhouses are still temporarily used when people are out hunting, or when families go camping.

Health and Education

Smaller communities seldom have



Little fresh food is grown in the circumpolar world. Fresh fruits and vegetables are imported and can be expensive. This grocery store is in Inuvik, Canada.

hospitals, but they do often have modern nursing stations. These small health centres, along with schools, played a role in persuading the descendants of First Peoples to settle in permanent communities. When serious sickness or injuries occur in smaller communities, patients are often sent to larger centres for treatment. In a health emergency, a medivac may be undertaken (the patient is evacuated



In Canada's North, most people live in houses similar to those in the rest of Canada.

to a larger health centre by chartered airplane). The plane usually has medical personnel on board.

Most circumpolar communities have schools. At about age six children are gathered in classrooms to receive formal education. The development of schools, particularly residential schools, caused some of the most profound changes for Aboriginal people in many circumpolar countries. Traditional education had always delivered by parents in the family setting. The establishment of schools, often by outsiders, meant that parents lost control of their children's education. Often values were taught in schools that were different from traditional values. The languages of the majority culture were most often used as the language of learning in these schools, so children began to lose their mother tongue.

Young people were often removed from their families and communities to attend schools in other places. As a result of these and other practices, a gap has often developed between the older and younger generations. Lack of understanding often leads to a lack of respect. These issues continue to pose challenges in many circumpolar communities today.

Today the descendants of many First Peoples have won the right to run, or have an important voice in, the operation of their schools. As a result, the local Aboriginal language is now often the first language of the school in smaller communities. The state language is introduced alongside



These children in Yellowknife are learning skills on computers. More and more, books and computer programs in aboriginal languages are becoming available.



Smaller communities usually have nursing stations instead of hospitals.

it, or at a later date. Recently, books and computer programs in Aboriginal languages are appearing. Local culture is respected in classrooms. Children develop a better appreciation of their own origins. A growing number of these children are now graduating from colleges and universities.

Religion

Christianity is the religion that prevails throughout most of the northern circumpolar world. Many of the descendants of First Peoples adopted various Christian faiths as a result of intense missionary activity conducted over the past few centuries. Recently, however, interest has been shown by some Aboriginal individuals in learning about traditional beliefs and practices, and reviving some of them. Elements of these beliefs still sometimes find expression in drama, dance, music, or the visual arts.

Government

Changes in government have been far-reaching. The descendants of First Peoples traditionally lived in small groups that were independent and self-governing. Even when they were first absorbed into the claimed territories of large nations, they were mostly left alone. In this century, however, the governments of these nations have turned their focus northward.

Now the descendants of First Peoples are subject to laws that are often made at some distance from them by people who do not always understand their circumstances or needs. Aboriginal peoples, once independent and autonomous, became subjects of large nations without being consulted. To recover a reasonable measure of control over their own lives, they have tried to negotiate self-government agreements with the larger nations, or tried to ensure that as much power as possible is placed in the hands of local and regional governments.

Economy

In many smaller communities, many people still rely to some extent on hunting and fishing to provide their families with food. They supplement this activity with trapping or part-time employment. These occupations



This photograph shows King Harald V opening a session of the Storting, Norway's national legislature. In Norway, the Sami are subject to laws that are made at some distance from them. However, the Sami do have their own assembly in which they can advise the Norwegian government.

provide cash income for purchasing various commodities. These commodities include modern items of technology used to carry on traditional pursuits: rifles and ammunition, snow machines, motorboats, fuel, traps, and nets, for example. They also include additional food, clothing, shelter, and entertainment.

Even where traditional economic pursuits are followed, they have sometimes been modernized. In Alaska and Greenland, for example, fishing has been commercialized. In Scandinavia some Sami have organized herding as a business.

Many people in the circumpolar world, like elsewhere, have turned to wage employment to earn their livings, even in small communities. They find employment in small business, retail services, tourism, construction, mining, transportation and communication services, **renewable resource** management, education, health care, and other government services. Increasingly, small businesses such as taxi

firms, fast food outlets, and coffee shops are owned and operated by Aboriginal people.

Transportation and Communication

Transportation in the circumpolar world has changed greatly. Dogs are now used mostly for racing. For work, dog teams have been replaced by snow machines. Snow machines are fast and quite reliable. They allow hunters to extend the range of the hunt. In the summer many people use all-terrain vehicles to travel on the land. They use factory-made canoes with outboard motors to travel on the open lakes and rivers, and boats for ocean travel. In smaller communities, trucks and heavy-tracked vehicles that provide municipal services are seen more frequently than cars. However, more cars are making their way onto the streets of medium-sized communities.

Airplanes and helicopters are the main mode of transportation for intra-regional and long distance travel. Because of the scarcity of railroads and highways, air transportation is more common than in any comparable-sized population in the world.

Communications in the circumpolar world compare favourably with those anywhere else in the world as well. Satellite imagery has a wide variety of uses: mapping, surveying potential highway routes and hydro-lines, classifying vegetation, making forest inventories, spotting forest fires, classifying and mapping animal habitats, making geological surveys, noting weather patterns, and checking ice conditions in the Arctic Ocean.

Satellites have put northerners in touch with one another and with the rest of the world. Televisions, radios, and telephones are found in most northern homes. Fax machines and computers are becoming more common.

Modern technology, like the Internet and cell phones, are becoming common as well. These methods of communication allow northerners to learn about the outside world as well as to make their own lifestyle and concerns known to others.

Sports and Entertainment

Having access to advanced communications systems, northerners entertain themselves in much the same way that southerners do. They watch television, movies, and videos, DVD's and listen to i-pods. But they also turn to more traditional forms of



Snow machines are fast, reliable, and allow hunters to travel farther on their hunts.

entertainment—music, dance, and friendly competitions that originated in earlier times. They hold drum dances, or square dances accompanied by tunes played on a fiddle or a button accordion. They hold dramatic presentations of traditional culture and they organize dog team races.

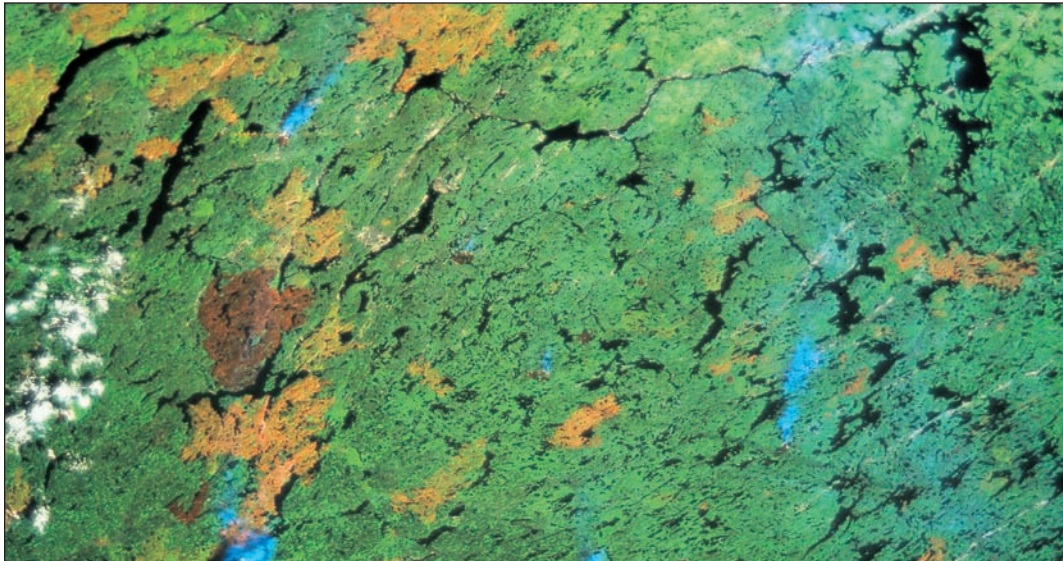
Sports play a large part in the lives of northerners—as entertainment and as a means of setting and meeting personal goals. Some traditional northern sports that test strength and skill, such as the one-hand kick and the knuckle hop, are still played. More commonly played, however, are sports that

are popular in many places around the world: soccer, volleyball, basketball, ice hockey, curling, and cross-country skiing. The biathlon, a combination of skiing and shooting, is also very popular.

Conclusion

Generally, the northern lifestyle is similar to the common lifestyle that has been catching on all around the world in this era of

rapid transportation and mass communication as the world becomes “a global village.” Yet the northern lifestyle has certain unique features that express the social history and traditions of the circumpolar world. These features also take account of the demands imposed by the circumpolar world’s physical nature: a vast, remote, sparsely populated land that has generally poor soil and very cold temperatures in the winter.



This satellite image shows the history of forest fires in the Caribou Range of Canada's Northwest Territories. “The light green areas show fire scars from 30 years ago, while the orange . . . from 20 to 25 years ago.”

DECIDE

Is mass communication good or bad for your community? List the pros and cons.

MAP

(pg 174) – Discuss reasons why some areas of the world are more densely populated than others. Do you know anyone who has left your community to live in a large city? Interview them and rank in order the top five reasons that they decided to move.

ASK ELDERS

Identify one social change that has taken place in your region during the past half century. Ask elders to evaluate that change as being good or bad. List the reasons they give. Repeat this process with middle aged adults and with teens. Compare responses. Identify the values that lie behind each response.

SEARCH

Record your daily menu and notice how much of the food that you eat is imported to the NWT. Now imagine that you only have access to the food you can find or grow in your region. What would your daily menu be with this restriction? Compare the two menus and determine which is more nutritious.



Sports play a large role in the lives of northerners. For example, there are over 12 000 sports clubs in Norway. The Norwegian Confederation of Sports has 1.7 million members. The population of Norway is just over 4 million. The Norwegians in this photo are competing in a marathon.

ASK ELDERS

Ask Elders – How many traditional foods are still an important part of many diets?

SEARCH

Prepare a survey to gather information on the average daily diets of Aboriginal and other people in your region. Make comparisons, noting particularly the portion of total diet coming from country food.

WEB RESOURCES

Department of Education, Culture and Employment
<http://www.ece.gov.nt.ca/>

Polarnet - About Nunavut

<http://www.polarnet.ca/polarnet/nunavut.htm>

Foreign Affairs Canada - Canada and the Circumpolar World

<http://www.international.gc.ca/polar-polaire/>

Challenges

CHAPTER 19

May 6

Here's Mary's report. She tells me she got to the Arctic Winter Games after all ! Her family travelled to Yellowknife during the spring break from school to watch her brother participate in northern sports. He won a bronze ulu; she had a wonderful time. No mention of Niels. I wonder if she's forgotten him already.



These children have a lifestyle quite different from their parents and grandparents. Lifestyles around the world will continue to change as new knowledge and ideas bring about new ways of doing things.

Challenges Facing the People of the Northern Circumpolar World Global Change

Everyone in today's world is challenged by change. There has been rapid and widespread change around the globe in this century. Many notable inventions in science and technology have had enormous impacts on human lives. All this change, complexity, and turmoil strains individuals and societies.

Lifestyles are changing throughout the world. People of all cultures now have a much greater awareness of other peoples, other lifestyles, and other values than they did before this century began. There is also more direct contact between people of different cultures—and a greater mixing of cultures. Individuals are exposed to a wider variety of influences. New

knowledge and new skills are required in the market place. New rights are asserted for all individuals, especially for women.

Change in the Circumpolar World

All of these developments occur in the circumpolar world just as they occur elsewhere, but here they are very pronounced. This is because the changes have been very great and very rapid.

For northern peoples there are two main categories of challenge brought about by change: physical environment and social environment.

Challenges in the Physical Environment

Dealing with Pollution

In the physical environment, the main challenge is to prevent pollution rather than trying to clean it up after it happens. The circumpolar environment is vulnerable. It can be damaged by careless development, poorly planned construction, oil and chemical spills, and household garbage. Because northern plants grow slowly, the environment takes a long time to recover when it is damaged.

Besides being vulnerable to damage, the arctic and subarctic environments are difficult and costly to clean up. Equipment to deal with serious environmental accidents may have to be brought in from distant places. Moreover, because summers are short, there is a limited time available to deal effectively with cleaning up a mess.

The prevention of pollution is not merely a theoretical concern for northerners. The northern polar region has already suffered damage from pollution. For example, there was a major oil spill



Damage done to the environment is often caused by human carelessness.

from a supertanker (the Exxon Valdez) in Alaska in 1989 and a major oil spill from a broken pipeline in Siberia in 1994. These spills caused terrible environmental damage. (See Chapter 10 for more about the Exxon Valdez oil spill.)

In 1986 there was an accident at a nuclear reactor in Chernobyl in the Ukraine. Radiation was released into the atmosphere. Some of it drifted to northern Scandinavia where it settled on lichens. In turn, this meant that reindeer meat was unfit to eat.

More recently, scientists have been warning that air pollution is affecting the ozone layer in the atmosphere. Northerners are particularly concerned about this because the greatest amount of ozone depletion has occurred over the polar regions where there are said to be “holes” in the ozone layer.



Oil spills have a devastating effect on wildlife. This whale washed up on the oil-soaked shore after oil spilled from the Exxon Valdez in Alaska in 1989.



Workers look for a leak on an old oil pipeline near Usinsk, Russia in 1994. They were trying to stop an oil spill that had polluted two rivers near the Arctic Circle.

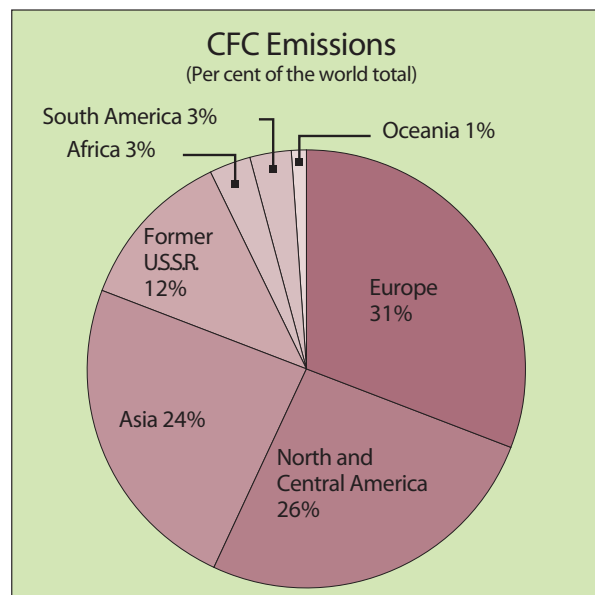


In 1991, a technician measures the radiation levels in Shisheloka, a village 50 kilometres from the site of the Chernobyl nuclear accident. Although the accident occurred in 1986, radiation remains.

Another big environmental concern for northerners is the greenhouse effect. If the earth's atmosphere warms significantly, as many scientists predict, serious environmental consequences will result. The polar regions will perhaps be impacted more than any other region of the earth. Winters will become shorter and warmer. Permafrost will begin to melt. Ice caps and glaciers will begin to melt. Ocean levels will rise. Plants and animals will be affected, with some cold weather species eventually disappearing. All of these developments would force a big change in the lifestyle of northern peoples.

Non-renewable Resources

A second challenge facing the physical environment is that of managing non-renewable resources, such as oil, gold, and other minerals.



CFCs (chlorofluorocarbons) are the primary cause of ozone depletion. Most industrial countries have eliminated the use of CFCs. However, the CFCs that have already been produced will remain in the atmosphere from 50 to 110 years, which will continue the ozone depletion.

The challenge is to manage these resources so that there is only minimal, short-term damage to the environment.

After these resources have been taken from the earth, they are gone forever. An additional challenge is to ensure that their development brings maximum benefit to northern people.



Reforestation projects attempt to replace the forests that have been cut down.

Those who live near the development should receive benefits in the form of jobs and business opportunities. It is a challenge to make sure this happens, though, because control over these resources often rests in the hands of people who do not live in the North.

Renewable Resources

A third major challenge faced by northern people concerning the physical environment is the conservation of renewable resources. This challenge has arisen because growing human populations seek to harvest wildlife populations that are limited in number by natural conditions. The challenge is made more urgent by human activities that damage or reduce the amount of wildlife habitat. In these circumstances, lawmakers must ensure that healthy populations of fish, marine mammals, game birds, and land animals

are maintained, while still permitting necessary economic activities, including a sustainable annual wildlife harvest.

There is another challenge for northerners too. Species such as polar bear, caribou, and various game birds have patterns of migration that take them across international boundaries. A conservation program in one country will not work if it is not supported in other countries. This means that northerners need to influence the negotiation of international wildlife treaties to protect migratory animals.

Challenges in the Social Environment

There are a number of social challenges facing northern peoples. Generally, these challenges are to maintain social harmony and to maintain social stability.

Social Stability

Social Harmony

that they literally cannot understand each other. As a result of all this, many people feel frustrated and unhappy. Societies may find themselves faced with serious social problems.

To try to deal with some of the problems of stress, the inability to cope with change, or feelings of worthlessness, some individuals may turn to the abuse of drugs and alcohol. They are trying to find a shortcut to happiness. But drug and alcohol abuse produce their own ill effects: spousal assault, child neglect, homicide, and suicide. In these circumstances, there is a challenge for

northerners to maintain social stability and good mental health. This challenge is being met in some places with healing centres and rehabilitation programs.

The Challenge of Politics

A challenge for people in the circumpolar world is to meet their needs and satisfy their desires even though they do not possess great political strength to help them do it. Political strength comes from having the support of large numbers of people or from having wealth or military power. It comes from having control of institutions that have the legal power to make decisions.

Compared to populations in other parts of their nations and in other parts of the world, circumpolar populations are small. They do not possess great wealth or military power. They do not control the governments of their nations. They do not have a powerful international presence.

To attain their ends, the greatest challenge for circumpolar peoples is to work hard and skilfully at using the small amount of political power they do possess. They need to be adept at advancing moral, legal, and practical arguments to support their positions.



Ovide Mercredi, former national chief of the Assembly of First Nations.

WEB RESOURCES

eLibrary

<http://elibrary.bigchalk.com/libweb/canada/do/login>
 NWT access - Username: govont0201 Password: elca

CultureGrams

Address: <http://online.culturegrams.com/>
 NWT access - Username: govnorthwest Password: welcome

Environmental Education Resources for Northern Canada (eenorth)

<http://www.eenorth.com/eenorth/index.cfm>

Foreign Affairs and International Trade Canada

<http://www.international.gc.ca/polar-polaire/index.aspx?lang=en>

Climate change North

<http://www.climatechangenorth.ca/index.html>

PARTICULAR CHALLENGES FOR DESCENDANTS OF FIRST PEOPLES

In the face of large numbers of people and the powerful influences that have flooded the circumpolar world, the descendants of First Peoples face the fundamental challenge of maintaining their identities as distinct peoples. They are challenged to take concrete, positive steps to preserve their languages and cultures.

Many individuals within First Peoples' cultures wish to affirm their aboriginal identity. Many are also drawn to a different lifestyle. The challenge is to find a personal balance between cherishing the old and adopting the new.

It is important to many descendants of First Peoples to know that they have a choice. In the face of employment needs and large-scale economic developments, the challenge is to conserve land and resources that can support a traditional lifestyle.

Some Aboriginal leaders believe that the answer to many of the problems lies in self-government, that is, in Aboriginal control of such programs as wildlife management, education, justice, health, and social services. These leaders also believe that self-government can work effectively only if Aboriginal governments have control of sufficient land and resources to implement their decisions fully. The negotiation of effective land claim agreements is an important challenge too.



These hunters and trappers have formed an association to protect their way of life.

SEARCH

Research the ways in which pollution damages the northern environment and the reasons why cleanup is difficult.

SEARCH

Report the details of any international wildlife agreement. Assess and report on the success of that agreement.

SEARCH

Explain what steps the descendants of First Peoples in your area have taken to preserve their identity.

RESEARCH

Research the ways in which pollution damages the northern environment and the reasons why cleanup is difficult. Research one example where a mining company has left an area without cleaning up the pollution left behind. Make a list of who benefited from the mine. Create a pie chart to represent the degree of responsibility each beneficiary has for the clean up.

Circumpolar Links

CHAPTER 20

May 7

It's my turn now. I've had most of my report done for quite awhile — honestly! But Ms Bohnet says she wants mine to wrap up things at the end, so I've waited to see the others before finalizing it. Well, I've seen them all now. Here goes!

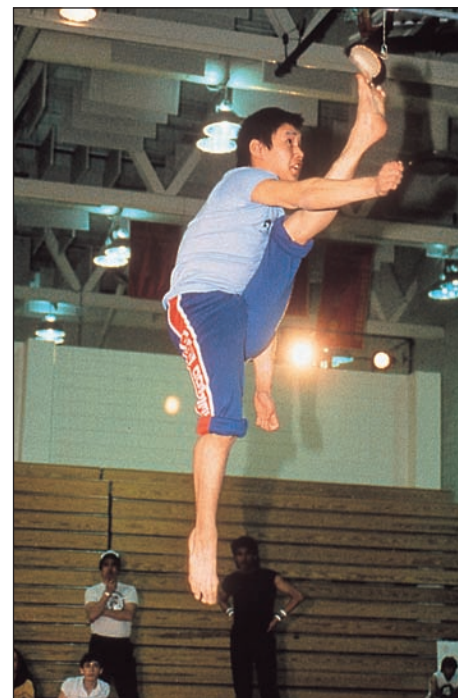
Links in the Circumpolar World

In the previous chapter we looked at the challenges facing the Northern Circumpolar World. By linking with other circumpolar countries and working together, we have been able to overcome many challenges or put programs and plans in place to help deal with them.

Informal Links

Informal, people-to-people links are made by ordinary circumpolar people who travel to visit relatives and friends in other circumpolar countries. They are also made by business people, architects, engineers, pilots, athletes, actors, and government program officers. They are made by curious tourists—and by students like us!

Informal links include cultural exchanges such as the Greenlandic National Theatre Company travelling to perform in Finland, or Sami athletes competing in the Arctic Winter Games in Canada.



This athlete is performing a one foot high kick in the Arctic Winter Games.

All of these informal links are important because they aid understanding among people. Understanding is essential to international peace and cooperation.

Formal Links

To advance common interests, the governments of circumpolar nations have established formal links with one another. There are several different instances of this.

Scandinavia

The Nordic Council was established in 1952 as a forum for Scandinavian cooperation. Its members include Norway, Sweden, Denmark, Finland, and Iceland. The autonomous areas of the Aland Islands (Finland) and the Faeroe Islands and Greenland (Denmark) have been given special status.

The Council is a permanent organization that usually meets once a year. It has 87 members. It includes members of Scandinavian parliaments who are elected by their parliaments to participate in the Council. It also includes ministers appointed by member governments. The Council makes recommendations to member governments. The majority of its recommendations are carried out.

The Council gets involved in a wide variety of matters. It works to coordinate legislation so that the content of important laws is similar in the member countries. It coordinates work on environmental protection. Because of the Council's work, polluters can be held liable in neighbouring states as well as the state in which the pollution first occurs. Laws have also been enacted that allow municipalities to cooperate in fighting pollution across national borders. The Council has also helped to eliminate trade and transport barriers between the member countries, to secure energy supplies, to advance telecommunications, and to foster cultural exchanges.

As a result of the Council's work, citizens of Scandinavian countries are free to travel, live, and work anywhere in Scandinavia without passports or visas. If they do choose to live and work in a Nordic country other than their



Many Scandinavian travellers pass through this train station in Copenhagen, Denmark. Scandinavian citizens can travel throughout Scandinavia without passports or visas because of the work of the Nordic Council.

own, they are entitled to the same medical and social benefits that the citizens enjoy.

Canada and USA

There is no formalized, permanent organization like the Nordic Council to coordinate activities between Canada and the USA. Yet the two countries cooperate in many ways to address common interests and concerns.

Many people consider the USA and Canada to be the best of friends and allies because they have much in common. Their long-term friendship is reflected in many ways. They visit one another's countries frequently, although American security concerns since the terrorist attacks of Sept 11, 2001 have increased the need for formal documents to be used for this kind of travel. Disputes about matters such as Canada's rights over the Northwest Passage, coastal fishing, or trade are most often peacefully resolved by negotiation or arbitration.

The United States and Canada have been at peace with one another since 1815. They were allies in World War I, World War II, and the Korean and Persian Gulf Wars. They have differed in significant ways in their approach to both Afghanistan and Iraq conflicts, however. They have also been partners in the North American Air Defence Command (NORAD) and members of the North Atlantic Treaty Organization (NATO).

They cooperated in setting up the Distant Early Warning (DEW) Line, and the more recent North Warning System, to alert the two countries to military attacks over the polar region.

Canada and the USA are linked economically as well. They have long been each other's largest trading partners. They are now linked in a bilateral Free Trade Agreement (FTA) and they are partners with Mexico in the North American Free Trade Agreement (NAFTA). Both countries express shared concerns about the environment, especially acid rain and pollution in the Great Lakes. They often approach these concerns through discussion and negotiation, rather than through coordinated law as in the Scandinavian countries.

More informally, there is a constant and massive flow of people and information between the two countries in business, tourism, and information and entertainment services.

A Complete Circumpolar Link

An important link has been forged by national governments that spans the entire



The North American Free Trade Agreement was signed in 1992. The people standing up are Mexican president Carlos Salinas de Gortari, American president George Bush, and Canadian prime minister Brian Mulroney. The people sitting down are their trade representatives.

circumpolar region. The eight circumpolar nations have come together to address common concerns about the arctic environment.

CARIBOU AGREEMENT

Special agreements have been made by circumpolar nations to address concerns about migratory wildlife that cross national boundaries. One of these wildlife agreements deals with the Porcupine Caribou Herd. The herd is named for the Porcupine River that flows from the Yukon to Alaska. It has more than 100 000 animals. The calving grounds are in Alaska but the animals migrate to Canada for much of the year.

In 1987 Canada and the USA signed an International Agreement for the Conservation of the Porcupine Caribou Herd. It requires both countries to work to conserve and manage the herd and its habitat. It also provides for an International Management Board to deal with issues that need to be resolved by international cooperation. This board is made up of users and representatives from Canadian and American governments.

More recently, Management Boards have been established, which include Aboriginal groups in managing caribou populations.

The First Ministerial Conference on the Protection of the Arctic Environment was held at Rovaniemi, Finland in 1991. It was attended by cabinet ministers from the eight circumpolar countries. The conference meets every two years.

Deeply concerned with threats to the arctic environment, the ministers adopted what is formally called the Arctic Environmental Protection Strategy. They committed themselves to joint action to implement the strategy. They will monitor arctic pollution generally and judge its potential danger. They will attempt to protect the marine environment, arctic plants, and animals. They will develop a program to meet environmental emergencies. They also set up working groups that meet on an ongoing basis to carry out agreed-upon tasks.

The ministers have invited delegates from the Inuit Circumpolar Conference (ICC), the Nordic Sami Council, and the Association of



One way of protecting land and wildlife is to create national parks and nature reserves.

Northern Small Peoples of Russia to participate as observers. They recognize that Aboriginal peoples should have a special role in the management of the arctic environment and the development of its resources.

The Conference has also made it clear that it is committed to *sustainable development*. Sustainable development is a way of managing natural resources so that human needs are met while healthy ecological processes are maintained. It is a way of ensuring that the needs of present and future generations can be met.

This ministerial initiative has received parliamentary support. A small number of elected

representatives from the national parliaments and other elected bodies of circumpolar nations have begun meeting occasionally to discuss matters of common concern. The first Conference of Parliamentarians of the Arctic Region was held in Reykjavik, Iceland in 1993. The second was held in Yellowknife, Canada in 1996. Representatives of northern Aboriginal groups have been invited to participate in these conference sessions.

The Arctic Council

The Arctic Council was established in September of 1996 as a unique form of cooperative consensus between eight Arctic states & six Indigenous organizations, including: Canada, Denmark, Finland, Iceland, Norway, Russian Federation, Sweden, the United States, Inuit Circumpolar Conference (ICC), Saami Council, Russian

Association of Indigenous Peoples of the North (RAIPON), Aleut International Association (AIA), Arctic Athabaskan Council (AAC), and the Gwich'in Council International (GCI). Through this council many of the common concerns & challenges of the circumpolar world are addressed.

The council's mandate is to protect the Arctic environment & promote the economic, social and cultural well-being of northern peoples. The chair of the council rotates among the member countries every 2 years and meetings are held in the chairing country twice a year.

THE ASSOCIATION OF NORTHERN SMALL PEOPLES OF RUSSIA

The Association of Northern Small Peoples of Russia is active in working to safeguard the interests of close to a million Aboriginal people. Its job is perhaps made more difficult by the fact that it is an association of peoples of different cultural origins. Yet it has an advantage that the Sami and the Inuit do not have. It can address its concerns to one national government. Internationally, the Association cooperates with both the Sami and the Inuit in addressing common concerns.



The Association of Northern Small Peoples protects the interests of close to a million Aboriginal people in Russia, such as the Yakuti.

NORDIC SAMI COUNCIL

Approximately 60 000 Sami live in Norway, Sweden, Finland, and Russia. The Sami in Norway, Sweden, and Finland have formed the Nordic Sami Council to serve as a link between their national associations and to advance their common interests. In 1956, they met at Karasjok, Norway and formally brought the Council into being.

Common aims were expressed and adopted by the Nordic Sami Council at a meeting in Tromsø, Norway in 1980. They declared:

1. *We, the Sami, are one people whose fellowship must not be divided by national boundaries.*
2. *We have our own history, traditions, culture, and language. We have inherited from our forefathers a right to territories, water, and our own economic activities.*
3. *We have an inalienable right to preserve and develop our own economic activities and our communities, in accordance with our own circumstances, and we will together safeguard our territories, natural resources, and national heritage for future generations.*

INUIT CIRCUMPOLAR CONFERENCE

The Inuit Circumpolar Conference (ICC) represents close to 130 000 Inuit in Greenland (Kalaallit Nunaat), Canada (Nunavut and Nunavik), the USA (Alaska), and Russia (Chukotka).

The ICC was organized on June 28, 1980 in Nuuk, Greenland by Inuit from Alaska, Canada, and Greenland. Inuit from Russia eventually joined, and gained full status at the Inuvik meeting in 1992.

The General Assembly of ICC delegates meet every three years to make decisions about matters that concern the Inuit. The Executive Council meets more often.



These dancers from Russia participated in the Inuit Circumpolar Conference at Inuvik in 1992.



These Dene drummers performed at a literacy conference for circumpolar nations in Yellowknife. Identify the countries whose flags are hanging overhead.

ARCTIC LEADERS' SUMMIT

The Inuit Circumpolar Conference has taken the initiative to summon an Arctic Leaders' Summit. They would like to have regular meetings of aboriginal leaders from the Nordic Sami Council, the Association of Northern Small Peoples of Russia, and the ICC. The Leaders' Summit would deal with such matters as subsistence rights for northern Aboriginal peoples; management of wildlife and other renewable resources; the cataloguing and use of traditional ecological knowledge; and the mandate and role of existing and future circumpolar organizations.

Northern Aboriginal peoples are also linked with the World Council of Indigenous Peoples. This organization fosters world-wide cooperation among aboriginal peoples. Its aims are to encourage solidarity among indigenous peoples, to exchange information, and to strengthen member organizations.

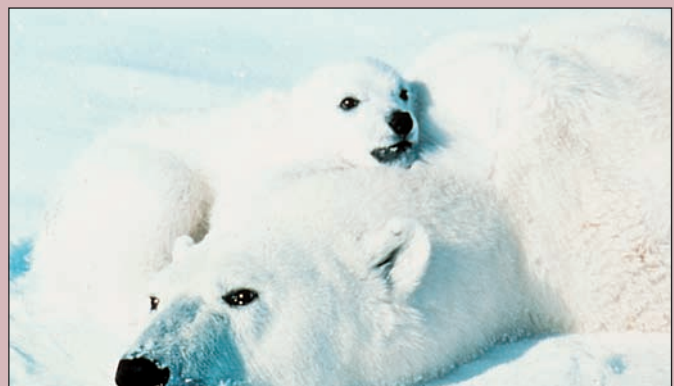
POLAR BEAR AGREEMENT

The International Agreement on the Conservation of Polar Bears and Their Habitats was signed in Oslo, Norway in 1973. It was designed to protect polar bears from being hunted to extinction. The Agreement was signed by the five nations which have significant polar bear habitat: Canada, Denmark (Greenland), Norway (Svalbard), the USA (Alaska), and the USSR (now Russia). The USSR had declared complete protection for polar bears as early as 1955. Norway stopped all hunting in 1973. The other countries allow carefully managed hunting.

The agreement sets out specific conditions for hunting or capturing polar bears. It also calls for international cooperation in research, management, and information on them.

The protection of polar bears was further increased when the five arctic nations signed the Convention on International Trade in Endangered Species (CITES, pronounced "site-eez"). This international agreement is designed to stop illegal trade in endangered species such as elephants and polar bears. CITES does its job partly by issuing export permits for items such as polar bear hides that have been taken legally in a country that manages the resource properly. This makes it difficult for poachers to transport illegal trophies across international boundaries.

Recent agreements, such as the Inuvialuit-Inupiat Polar Bear Management Agreement(2000), reflect the growing participation of Aboriginal groups in the management of wildlife in the circumpolar world.



The International Agreement on the Conservation of Polar Bears and Their Habitat is designed to protect polar bears from being hunted to extinction.

There are three main current issues being addressed by the Arctic Council as of 2008:

1. Dangers & challenges posed by climate change
2. Need for sustainable economic development
3. Importance of sharing experiences & knowledge with our circumpolar neighbours and the larger world

Decisions within the Arctic Council are taken at meetings of Foreign Ministers that are held every two years. The work of the Council is supervised and directed by the Arctic Council Senior Arctic Officials. Canada calls on the Arctic Council Advisory Committee for input and guidance on Canadian priorities and positions brought to the Council. The Advisory Committee includes federal departments, territorial governments, Indigenous Canadian Permanent Participants to the Arctic Council, and non-governmental organizations with an interest in arctic issues.



Northern areas of circumpolar countries have established transportation routes to the southern parts of the countries. However, the northern areas do not have many routes connecting each other.

The Arctic Council has been one of the major drivers for the development of the Northern Dimension of Canada's Foreign Policy (NDFP). Canada is committed to increasing the overall effectiveness of the Arctic Council and the contribution made by Indigenous Permanent Participants, in order to better promote Canadian objectives such as environmental protection, international cooperation and sustainable development.

The NDFP sets out a vision for Canada in the circumpolar world, based on cooperation with Northerners and our circumpolar neighbours.

The northern foreign policy promotes Canadian interests and values as we work to address the issues we have in common with our northern partners.

The NDFP has four main objectives:

- 1 to enhance the security and prosperity of Canadians, especially northerners and Aboriginal peoples;
2. to assert and ensure the preservation of Canada's sovereignty in the North;
3. to establish the Circumpolar region as a vibrant geopolitical entity integrated into a rules-based international system; and
4. to promote the human security of northerners and the sustainable development of the Arctic.



Although technology is available to establish circumpolar radio and television broadcasting networks, this link has not been made.

Our Canadian priorities include strengthening the Arctic Council; establishing & sustaining a University of the Arctic & a Canadian and circumpolar policy research network; working with Russia to address its northern challenges; and promoting sustainable economic opportunities and trade in the North.

highways through terrain underlain by permafrost are a challenge to build and to maintain successfully. They are expensive because they must be built over very long distances, yet provide service to relatively few people.

A circumpolar highway would have to be supplemented with links across the sea. The sea links would be hindered by ice for much of the year and they would need to be serviced by an expensive ice-breaker fleet. Air links are possible, of course, but they are extremely expensive.

Although it would be difficult and costly to establish permanent transportation links, it is possible. Yet these links have not been established to any great extent for a good reason. There is not enough demand to move people, goods, and services around the circumpolar nations. Perhaps the similarity of resources in these countries is one reason for this.

Communication Links

Communication links present a different problem. Circumpolar countries have similar interests, problems, and concerns. The technology is available to establish circumpolar radio and television broadcasting networks that would keep countries in touch. In spite of a need and the means, the link has not been made. One main reason is that the majority of people do not understand one another's language.

Another factor holds back the development of transportation and communication links around the circumpolar world. There is a general lack of interest in developing these links. Throughout the history of each circumpolar nation, satisfactory links have already been made with other nations. There is no rush to change them. Nations, like individuals, are reluctant to overthrow old friends in order to make new ones.

The Internet and other forms of electronic communication can overcome some of the limitations of distance for small and isolated communities. At present, few Arctic communities have full access to the best technology. Issues to be resolved include cost of service, availability of computers, and limited resources for training and support. Active community involvement in creating content would ensure that Information



What do you think the future holds for the peoples of the northern circumpolar world?

and Comuncation Technology (ICT) becomes a constructive tool for development in Arctic settlements. This use of ICT may also result in improved information *about* the Arctic becoming more widely available.

The Future

The governments of circumpolar nations may be reluctant to change established patterns of relationships, but the descendants of the First Peoples clearly have common needs and common concerns. They are making opportunities to maintain, broaden, and strengthen their contacts with one another. They are at the forefront of forging new links around the northern circumpolar world.

SEARCH

You have been asked to present a speech at a Canada and the Circumpolar World Conference. As part of the future generation, you will present your speech on what you believe is the most important issue facing Canada and the Circumpolar world today. When you have selected your issue, your task is to research when and how this issue became a problem (background information), and present any possible solutions to this current issue. You must also ask two questions to the conference delegates (your classmates) so that they will think about the issue and try to help you come up with a solution in a class discussion on your topic.

SEARCH

List the languages that are commonly used by various peoples of the circumpolar world. Discuss whether there is a practical possibility that any one of those languages could become a common language for all peoples in the circumpolar world.

THINK

Why do you think the countries participating in the Nordic Council do not combine into a single country? What would be the advantages and the disadvantages of combining?



Ice roads are an increasingly important means of transporting goods to remote locations in the circumpolar world.

WEB RESOURCES

eLibrary (password protected)

<http://elibrary.bigchalk.com/libweb/canada/do/login>

NWT access - Username: govont0201- Password: elca

CultureGrams (password protected)

<http://online.culturegrams.com/>

NWT access - Username: govnorthwest - Password: welcome

The Arctic Council

<http://www.arctic-council.org/>

Canada and the Circumpolar World

<http://www.international.gc.ca/polar-polaire/index.aspx?lang=en>

May 20

Here is Ms Bohnet's letter to our group. She says she is going to meet a friend in Moscow this summer. I wonder if it's that Russian guy we saw her with in Yakutsk? It would be great if they got together — a fine ending to our journey. Maybe we'll all be invited to a wedding!

Epilogue

(Alice Bohnet's Letter)

May 14

Dear friends,

Thank you for getting your reports in on time. I think they're very good, and I'm sure our sponsors will think so too.

Together we've produced a fairly thorough account of life in the circumpolar world. Many things are left out, of course. There's just too much to cover. And I'm sure we haven't always satisfactorily captured the wonder, the excitement, or the "truth" of the northern circumpolar world. But I hope we've said enough to make our future readers want to travel and experience that world for themselves.

Reading your reports reminded me vividly of our journey. I thought of the magnificent landscapes we saw—landscapes that were similar in many locations. I thought too of the familiar plants and animals we saw as we travelled. These similarities in nature around the globe made me feel that it is quite appropriate to speak of the northern circumpolar world as though it were one.

Then I remembered the many differences we found among the societies—in government, language, and culture. They delighted and interested us to be sure, but they also sometimes confused us and challenged our understanding. Remembering this, my initial feeling began to change. There is not one circumpolar world, but many.

Then I thought of you. Each of you comes from a different country and different race or cultural background. Each of you is an individual, distinctly different from the others in our group. Yet in many important ways, I didn't find you very different from one another. You have essentially the same needs, interests, abilities, concerns, and aspirations. Your clothes, food, and homes are similar. You participate in many of the same activities. You enjoy life. You want to be happy, free, and to develop your potential. These many similarities among you make me feel there is one circumpolar world after all.

I want to compliment you on the way you behaved on the tour. You earned the admiration and respect of everyone you met. I am proud remembering your thoughtful questions, hard work, and courtesy.

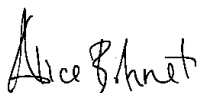
I hope you'll keep in touch with me and with one another. Perhaps we'll all meet again some time. I hope so.

As a result of our journey, we are now in the fortunate position of having contacts around the globe. These will be useful for future travel. That reminds me—I'm going to rendezvous in Moscow this summer with a friend I met on our tour. I'm really looking forward to the trip!

Thank you for helping to make our circumpolar journey one of the most wonderful experiences of my life. If any of you should need a character reference in the future, don't hesitate to ask. I'd be happy to provide one for you.

Love,

Alice Bohnet



Glossary

A

Aboriginal: original or earliest known; the earliest known people to inhabit an area

assembly: a gathering of representatives; often this name is given to a gathering of elected representatives who form a legislature or parliament

B

barren lands: often used to identify the tundra or treeless plains of northern Canada, but can be used to describe any dry area with sparse vegetation

C

cabinet: a group of ministers who form a government; commonly each minister is responsible for some area of public business such as defence, education, or health

climate: the composite and generally prevailing weather conditions of a region; includes temperature, air pressure, humidity, sunshine, cloud, precipitation, and wind throughout the year and averaged over a long period of years

coalition: a combination of two or more political parties that temporarily unite to form a government; this is usually done in circumstances where no single party is able to win a majority of seats in the parliament

conservation: the prevention of injury, decay, loss, or waste; often applied to the management of renewable resources

constitutional monarchy: a country which has a monarch (a king or queen) as its head of state, but in which the monarch's powers are limited and set forth in a constitution; like all other citizens, the monarch is subject to the laws passed by an elected legislature; the monarch does not have authority over the day-to-day functioning of government: this authority is commonly in the hands of a prime minister and cabinet

convection: the upward or downward movement of air or water caused by differing temperatures

currency: money, or anything else that is used in commerce as a standard of value or a medium of exchange

D

democracy: a system of government in which government authority resides in the hands of all the people rather than in the hands of one person (an absolute monarchy or a dictatorship), or a few (an oligarchy or an aristocracy)

Dene: a generic name given to various tribes of Athapaskan-speaking peoples in the northwestern part of Canada; the term is used in a similar way that the term "Indians" is used in southern Canada

E

economy: the organized structure under which the production, distribution, and consumption of goods and services is carried out

ethnic mix: the distribution of people from different cultures within a pluralistic society

exploiting: developing and using resources for profit

exports: commodities or services that are shipped to other countries for sale or exchange

F

fiord: a long, narrow arm of the sea bordered by steep cliffs; often formed by glacial erosion

foreign policy: a nation's policy with respect to its relations with other countries and its attitude to their various actions

G

geography: a study of the earth's surface considering such elements as climate, elevation, soil, vegetation, population, the distribution of land and water, land use, resources, and the boundaries of nations

geothermal energy: energy derived from water that is heated to significantly high temperatures by the internal heat of the earth; the water comes to the surface in hot springs

greenhouse effect: the earth's atmosphere gets warmer as ever greater amounts of carbon dioxide are produced by the burning of fossil fuels such as coal, oil, natural gas, and gasoline

H

hectare: an are is a unit of land measurement, or area, 10 metres by 10 metres, or 100 square metres; a hectare is a unit of land measurement equivalent to 100 ares, or a total of 10 000 square metres

hot spring: a thermal spring having water warmer than 37°C; the water is heated by passing near hot or molten rock beneath the earth's surface

I

imports: commodities or services brought in from foreign countries for use or sale

indigenous: originating in, and natural to, a particular region; the word is sometimes used as an alternative word in the phrase "Aboriginal peoples," but it actually carries a different meaning than "Aboriginal": it implies not merely that a group of people was the first to visit a region, but that it originated there

individualism: the belief that the individual, rather than the group, must have primary consideration

International Date Line: an imaginary line that follows approximately 180° Longitude; since there is no natural starting place for calendar dates on the earth's surface, this line is arbitrarily used to serve as the starting place for each new calendar date; places just west of the line are deemed to be one day further along in the calendar than places just east of it

Inuit: an Aboriginal people, consisting of many distinct groups, inhabiting the arctic coastal areas of eastern Siberia, northern and western Alaska, northern Canada, and Greenland; formerly known incorrectly as "Eskimo"

isotherm: a line on a weather map connecting places that have the same temperature, or on a climatic map connecting places that have the same average temperature at a particular date in the year

K

krill: small, shrimp-like creatures that live near the surface of the open ocean and feed on phytoplankton; they in turn serve as food for certain whales

L

latitude: a location's distance in degrees either north or south of the Equator (which is 0° Latitude); there are

90° of North Latitude and 90° of South Latitude

legislature: an elected assembly whose primary task is the passing of laws for a province, state, or nation

life expectancy: the average life-span of men and women in particular nations, calculated from statistics by averaging the length of lives of all who have previously lived in the nation; in actual fact, some people live longer, and some live shorter lives than this statistical average indicates; life expectancy varies between men and women (women tend to live longer) and between various nations (depending on the quality of health and social services, on whether prosperity or poverty prevails, war or peace, and so on)

M

materialism: the tendency to give undue importance to possessing material things, as opposed to the tendency to pursue other values such as sharing or family life

merchandising: the buying and selling of material goods

metabolism: the sum of all the chemical and physical processes in the body by which the substance of the body is produced, maintained, and destroyed and by which energy is continually made available

Métis: a term used in Canada to describe persons of mixed European and Indian origin; there are significant numbers of Métis in the western part of Canada's Northwest Territories

minister: a cabinet member chosen by a government to be responsible for some aspect of public business such as defense of public works

N

natural resources: a country's natural wealth, consisting of water, fish, land, wildlife, forests, mineral wealth, and so on

negotiate: discussing, bargaining, and compromising in order to reach agreement

non-renewable resource: a natural resource, such as gold or petroleum, that does not replenish itself

Norse: the people and language of ancient Scandinavia; derived from a word for "North," to recognize where these people lived

Northeast Passage: a once-hoped-for easy water pas-

sage from Europe to the Orient north of the Eurasian continent; there is a water passage there, but it is clogged with ice for much of the year

North Pole: 90° North Latitude; the northernmost point on the earth's rotational axis

Northwest Passage: a once-hoped-for easy water passage from Europe to the Orient north of North America; there is a water passage there, but it is clogged with ice for much of the year

O

ozone: ozone occurs naturally in the atmosphere and protects living things from the sun's ultraviolet radiation; it is destroyed by chemicals such as chlorofluorocarbons and nitric oxide that enter the atmosphere as a result of human activity

P

physical environment: the material situation in which living beings find themselves, amidst air, land, water, and living things

plain: a broad expanse of land having little "relief" (ups and downs in elevation) on its surface

plateau: a fairly flat area of land that is quite distinctly elevated above the surrounding area; sometimes called a tableland

political party: an organization established by persons who have a similar social outlook and similar social goals; its primary purpose is to attain political power so its elected members can form a government and thereby determine public policy and law

pollution: the introduction of harmful substances into the environment with the result that some element of nature is damaged

precipitation: any of the products of moisture condensation that fall in the earth's atmosphere: rain, snow, sleet, or hail

president: the chief executive officer of the government of a modern republic; generally attains the position by being elected directly by a majority of all eligible voters in the nation (for example, the American president)

prime minister: the principal cabinet minister and head of government in a parliamentary system of government; generally attains the position by being leader of

the political party that attains most seats in the parliament during an election (for example, the Canadian prime minister)

purse seine net: a fishing net that is used to catch schools of fish near the ocean's surface; it is drawn around the fish and then closed with a heavy drawstring made of cable or rope; when closed, the net forms a purse or pouch from which the fish cannot escape

R

radiation: a process in which energy is emitted from an object in the form of particles or waves; excessive exposure can be harmful to humans

renewable resource: a natural resource, such as fish or trees, that will replenish itself if nature is not thoughtlessly and radically abused; with growing populations of humans, wise management of renewable resources is required to ensure that these resources are able to replenish themselves

representative government: a democratic form of government in which representatives are elected from among the people to make policies and laws to which everyone will be subject

republic: a government that has a president at its head, rather than a monarch

resource: anything that can be used by humans to help satisfy needs or accomplish objectives

rotational axis: the axis is an imaginary line through the centre of earth from the North to the South Pole and the earth rotates around this axis; it takes 24 hours to make one rotation

S

self-pollination: the transfer of pollen from the anther to the stigma of the same flower, or to another flower of the same plant, eventually producing seeds for reproduction

Siberia: a huge part of Russia, extending from the Ural Mountains to the Arctic Ocean in the north, and to the Pacific Ocean in the east; noted for its remoteness from the main centres of Europe and Asia and for its cold climate

social change: the change that occurs in all societies over time; brought about by the introduction of new peo-

ple, new ideas, and new practices; social change is sometimes rapid and revolutionary and sometimes so slow as to seem non-existent, yet it is always occurring

social environment: the social situation in which humans find themselves: that is, among other humans, some of whom are of the same culture and some different, in a democracy or a dictatorship, amidst poverty or plenty, at war or peace, and so on

social organization: the manner in which a society has structured itself to accomplish government, to conduct industry, trade, commerce, and social relations

society: an organized group of persons associated together to further the accomplishment of their mutual aims

T

technology: the sum of the ways in which societies provide themselves with the material objects of their civilization (their tools, weapons, buildings, furnishings, means of transportation, and so on)

topography: the surface features of a land area: plains, valleys, hills, mountains, gorges, plateaus, and so on

treeline: the line encountered, either while climbing a mountain or travelling toward the Arctic, beyond which trees do not grow; the absence of trees is caused largely by sparse precipitation, cold temperatures, and poor soil (or none at all)

tundra: a Sami word meaning “rolling, treeless plain”

U

unemployed: being without a job and wanting one in a social setting where earning income for working is the common practice

utilidor: an above-ground insulated network of pipes and cables used to provide water and other services to communities situated in an area of permafrost

V

veto: a powerful No vote that can stop something from happening

voyageurs: Canadian crewmen on fur-trade canoes; they paddled the canoes and carried cargo at portages

W

weather: the state of the atmosphere with respect to temperature, moisture, air pressure, wind, cloud, and so on

Photo Credits

The Department of Education, Culture and Employment would like to express our appreciation for the assistance of Elaine Maloney of the Canadian Circumpolar Institute for identifying and supplying visual resources for this textbook.

Entries are by page number, coded as follows:

T=Top B=Bottom L=Left R=Right

Abbreviations

GNWT EC&E	Government of the Northwest Territories Education, Culture and Employment
GNWT RR	Government of the Northwest Territories Renewable Resources
GNWT CRS	Government of the Northwest Territories Centre for Remote Sensing

4	B- Tessa Macintosh/ GNWT EC&E
4	T- Tessa Macintosh/ GNWT EC&E
6	T- Tessa Macintosh/ GNWT EC&E
6	B- Tessa Macintosh/ GNWT EC&E
7	Ivanitz/ Canadian Circumpolar Institute
9	Canapress Photo Service
11	Kerrie Ann Shannon
12	Bruce Sekulich/ GNWT EC&E
14	#742 Yukon Archives/National Museum of Canada Collection
15	Yukon Executive Council Office/I10-14-1-89-113
16	Mike Thomas
19	TB- Tessa Macintosh/ GNWT EC&E
19	BL- Tessa Macintosh/ GNWT EC&E
19	BR- Tessa Macintosh/ GNWT EC&E
20	Tessa Macintosh/ GNWT EC&E
21	Fran Hurcomb/ GNWT EC&E
22	T- Leela Gilday
22	B- Tessa Macintosh/ GNWT EC&E
23	Tessa Macintosh/ GNWT EC&E
24	T. Ikumaq/ GNWT RR
25	Tessa Macintosh/ GNWT EC&E
28	France Benoit
31	BL France Benoit
31	BR-France Benoit
32	France Benoit
32	France Benoit
33	France Benoit
34	France Benoit
34	France Benoit
36	France Benoit
36	France Benoit
38	Dr. Ross W. Wein
39	Dr. Ross W. Wein
41	V. Last/Geographical Visual Aids
42	TB- Dr. Ross W. Wein
43	Dr. Ross W. Wein
44	BL- Dr. Ross W. Wein
45	Dr. Ross W. Wein
46	Urpo Tarnanen - Royal Norwegian Embassy
50	Per N: Haukeland/Hybris film - Royal Norwegian Embassy
51	Dr. Ross W. Wein

52	Statoil - Royal Norwegian Embassy
54	T- Foto Flite - Royal Norwegian Embassy
54	B- Per N: Haukeland/Hybris film - Royal Norwegian Embassy
55	DNFI - Royal Norwegian Embassy
56	Hans Brox/Scanfoto - Royal Norwegian Embassy
57	Jan Greve/Scanfoto - Royal Norwegian Embassy
58	Gesa Neumann
61	TR- V. Last/ Geographical Visual Aids
61	TL- V. Last/ Geographical Visual Aids
62	B- V. Last/ Geographical Visual Aids
62	T- Gesa Neumann
64	Gesa Neumann
65	LEGO System A/S
66	Marianne Lindvall
69	Marianne Lindvall
70	A. Mokvist/ Swedish Travel & Tourism Council
71	The Nobel Foundation
72	M. Itokazu/ Swedish Travel & Tourism Council
73	B- Tomteland/ Swedish Travel & Tourism Council
73	T- L. Gullachsen/ Swedish Travel & Tourism Council
74	A. Mokvist/ Swedish Travel & Tourism Council
78	Nina Parikka
81	R- Nina Parikka
84	Nina Parikka
84	TR- Nina Parikka
84	BR- Nina Parikka
85	Nina Parikka
86	Nina Parikka
87	Dr. Ross W. Wein
88	V. Vyatkin - Photo "Novosti"
89	GNWT CRS
92	S. Korytnikov - Photo "Novosti"
93	Dr. Ross W. Wein
94	D. Korobeinikov - Photo "Novosti"
95	Dr. Ross W. Wein
96	B- M. Redkin - Photo "Novosti"
96	T- Dr. Ross W. Wein
97	Taras Balan - Ferguson Simek Clark
98	A. Polyakov - Photo "Novosti"
100	Mark Skok / Alaska Division of Tourism
102	Alaska Division of Tourism
104	Canapress Photo Service
103	Kerrie Ann Shannon
106	John Hyde- Alaska Dept. of Fish & Game / Alaska Division of Tourism
107	B- Ernst Schneider / Alaska Division of Tourism
107	T- BP/Alaska Division of Tourism
108	Alaska Division of Tourism
110	L- Canapress Photo Service
110	R- Anchorage Convention & Visitor Bureau/Alaska Division of Tourism
111	Anchorage Convention & Visitor Bureau/Alaska Division of Tourism
112	Alaska Division of Tourism
113	Tessa Macintosh/ GNWT EC&E
115	Tessa Macintosh/ GNWT EC&E
117	Tessa Macintosh/ GNWT EC&E
119	Parks Canada
121	Tessa Macintosh/ GNWT EC&E
122	Tessa Macintosh/ GNWT EC&E
124	Tessa Macintosh/ GNWT EC&E
125	France Benoit

126	Pål Hermansen/Samfoto - Royal Norwegian Embassy	178	Tessa Macintosh / GNWT EC&E
127	Reidar Munkejord/Karmøy kommune - Royal Norwegian Embassy	179	GNWT CRS
128	T- Lorne Smith/ GNWT EC&E	180	Espen Bratlie/Samfoto - Royal Norwegian Embassy
128	B- R. Popko / GNWT RR	181	Tessa Macintosh / GNWT EC&E
129	France Benoit	182	L- Bruce Fleming
132	T- Tessa Macintosh/ GNWT EC&E	182	R- Canapress Photo Service
132	B- Bruce Sekulich/ GNWT EC&E	183	B- Canapress Photo Service
133	TL- Mike Thomas	183	T- Canapress Photo Service (AP PHOTO/Alexander Zemlianichenko)
133	TR- Tessa Macintosh/ GNWT EC&E	184	Tessa Macintosh / GNWT EC&E
135	T- Dr. Ross W. Wein	185	Tessa Macintosh / GNWT EC&E
135	B- N. Zaitsev/ Photo "Novosti"	187	Tessa Macintosh / GNWT EC&E
137	North East Pacific Culture Collection/ UBC Dept. of Oceanography	188	Tessa Macintosh / GNWT EC&E
138	T- Tessa Macintosh/ GNWT EC&E	189	Gesa Neumann
140	B- Tessa Macintosh/ GNWT EC&E	190	Fred Chartrand/ Canapress Photo Service
140	L- Tessa Macintosh/ GNWT EC&E	192	T- M. Kukhtarev - Photo "Novosti"
140	TR- Tessa Macintosh/ GNWT EC&E	192	B- Tessa Macintosh / GNWT EC&E
141	Tessa Macintosh/ GNWT EC&E	193	T- Tessa Macintosh / GNWT EC&E
142	TR Bob Wilson/ GNWT EC&E	193	B- W. Spencer / GNWT RR
142	B Ray Lake	194	L- Gesa Neumann
143	T- GNWT RR	194	R- Tessa Macintosh / GNWT EC&E
143	M- Tessa Macintosh/ GNWT EC&E	195	Tessa Macintosh / GNWT EC&E
143	B- Tessa Macintosh/ GNWT EC&E		
144	Tessa Macintosh/ GNWT EC&E		
145	D. Heard / GNWT RR		
146	W. Spencer/GNWT RR		
147	GNWT EC&E		
148	T- Tessa Macintosh/ GNWT EC&E		
148	B- D. Heard / GNWT RR		
149	T- J. Lee / GNWT RR		
149	B- R. Popko/ GNWT RR		
151	T- G. Calet/ GNWT RR		
151	TM- Wayne Spencer/ GNWT RR		
151	M- Kim Poole/ GNWT EC&E		
151	B- Doug Heard/ GNWT EC&E		
154	Tessa Macintosh/ GNWT EC&E		
155	Tessa Macintosh/ GNWT EC&E		
156	Tessa Macintosh/ GNWT EC&E		
157	T- Tessa Macintosh/ GNWT EC&E		
157	B- J. Swietlik/ GNWT EC&E		
158	France Benoit		
159	R- Tessa Macintosh/ GNWT EC&E		
159	L- Tessa Macintosh/GNWT EC&E		
162	A. Cornellier/ Parks Canada		
164	L- C-17727 National Archives of Canada		
164	R- Jennifer Keane		
165	L- Tessa Macintosh / GNWT EC&E		
165	R- C-2146 National Archives of Canada		
166	L- C-16946 National Archives of Canada		
166	R- Eivind Engebretsen Photo: O Væring - Royal Norwegian Embassy		
168	C-20053 National Archives of Canada		
168	L- Courtesy of the Swedish Institute		
170	Aschehoug forlags arkiv. - Royal Norwegian Embassy		
171	GNWT EC&E		
172	Tessa Macintosh / GNWT EC&E		
173	Tessa Macintosh / GNWT EC&E		
175	Carolyn Pogue		
176	L- Tessa Macintosh / GNWT EC&E		
176	TR- Carolyn Pogue		
176	BR- Bob Wilson / GNWT EC&E		
177	Knudsens Fotosenter - Royal Norwegian Embassy		

The Department of Education, Culture and Employment and Redimore Books have made every effort to correctly identify and credit the sources of all photographs, illustrations and information used in this textbook. The Department of Education, Culture and Employment appreciates any further information or corrections; acknowledgement will be given in subsequent editions.