FROM THE CONFERENCE MELTING ICE—A HOT TOPIC?

Melting ice—a personal view of climate change

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I first crossed the Arctic Circle on my way north in the early 1970s. I visited the glaciers in Swedish Lappland and Norway's rugged Lofoten islands. Apart from the natural beauty of the area, my main interests were climate and geological history, as I was then working towards a doctoral degree in glacial and marine geology, which I earned in the late 1970s. Since then I have been in the Far North nearly every year. In the beginning I travelled in the Scandinavian mainland; later I saw Iceland, Svalbard and Greenland. Special highlights were the Northwest and Northeast Passages.

The first time I recognized changing glaciers was in the Rocky Mountains of Britsh Columbia and at Glacier Bay National Monument in south-east Alaska. Several journeys to the latter place gave evidence for retreating ice, as shown in two photographs of McBride Glacier, taken in 1980 and 1989. As I saw retreating glaciers in Norway (Jostedalsbreen, Svartisen, Briksdalsbreen) and in North America I was told "these are natural processes; other glaciers are advancing". Since then I have seen many glaciers in Svalbard and on Greenland: nearly all of them in retreat. The drift ice in the Arctic Ocean is also affected, in terms of its age, thickness and surface area. I have seen the Arctic ice from the Norwegian Polar Institute's research vessel *Lance*, the University of Tromsø's *Jan Mayen* and the Alfred Wegener Institute's *Polarstern*, and from several ice-breakers and cruise ships. You only see the differences when you come back again and again and—most important—when you also talk to the Arctic's indigenous peoples.

Inuit people in Greenland, Nunavut and Alaska told me that they are very much concerned about the huge loss of ice. Their traditional foods, like seals, whales, polar bears and birds, have also changed their behaviour. The summers are becoming warmer: the ice comes later in the fall and disappears earlier in the spring after a mild

Iceberg and summer ice, East Greenland.

McBride Glacier, Alaska, 1980.

McBride Glacier, Alaska, 1989.

Researchers working on summer ice in the Arctic.

Summer ice in the Arctic.

Inuit woman preparing fish and seal meat in Holman, Victoria Island, Canada.

winter. Ice is essential for many species. Several seal species give birth to their cubs only on ice, polar bears catch their prey only on ice, and some birds find their fish and krill only in drift ice.

One of the most impressive views I had was the melting permafrost in the tundra. After a visit in 1999 to Herschel Island, in north-west Canada, I came back in 2006. In 1999 there had been lots of ice in the Northwest Passage. Seven years later—in the same month (August)—there was nearly no ice. But on Herschel Island itself I saw the most striking sight: black spots in the tundra and at the coastal cliffs. The black spots—melting permafrost—look like wounds or lesions. Sediments are washed out to the sea, blocking out the

Young harp seal on the ice.

Polar bear family feeding on a seal, Northwest Passage, 1999.

Kittiwakes fighting over a polar cod.

sunlight and obstructing marine algae's photosynthesis. Satellite photographs of recent years confirm this development all over the north.

Another effect is the release of additional greenhouse gases like carbon dioxide and methane into the atmosphere. I faced this phenomenon—without knowing what it was—in 1982 during an excursion to the Lena River in Sibiria as part of the International Quaternary Congress in Moscow. Russian scientists presented us with newly emerged lakes in the taiga. Normal permafrost and pingos had melted and disappeared in only a few years, and large larch trees had toppled over and rolled down to the river banks. The

Polar bear ashore, Bellot Strait, Northwest Passage, 2006.

Ice-free Gjoa Haven, Nunavut, Canada.

Thawing tundra on Herschel Island, Canada.

Thawing tundra on the north-western Canadian Arctic coast.

Young boy in Greenland.

Thawing taiga on the Lena River, near Yakutsk, Russia, in 1982.

Inuit children, Qaqortoq (Julianehåb), Greenland.

Young girl in the village of Uelen, Chukotka Autonomous Okrug, Russia.

reason was unknown at that time—25 years ago. Now we know.

More than 30 years of taking pictures in these remote environments [see www.polarfoto.com—the Editor] has given me an impressive documentation of what has happened and what is happening now. I know this pictorial record, my contribution to this conference, is not scientific proof of climate change in the Arctic. But my observations and experiences all point in the same direction. I live in Tromsø, on the edge of the Arctic, and am approaching retirement. I want to help—especially young people—to understand what is happening. The Arctic children are concerned wherever they live. What will be their future when the ice has gone?

Polar bear, Hornsund, Svalbard.