

Letter from Varandei

Andrei V. Golovnev



Note. – In the 1980s, expectations of an oil boom in the Nenets Autonomous Okrug fueled dreams of economic development for the community of Varandei on the coast of the Barents Sea. The first oil tanker headed from Varandei to Arkhangelsk as an experimental voyage in 1985. In 1999 Aker MTW (a Norwegian-owned shipyard in Germany) delivered three new ice-breaking oil tankers to Lukoil Arktik Tanker, a subsidiary of the Russian company Lukoil (Aker MTW 1999), as part of a programme to build up a fleet. Designed to transport chemicals, oil products, vegetable oils and refinery condensates, these tankers are expected to be used for deliveries to towns along the Northern Sea Route and eventually to ship crude oil from the fields of northern Russia. In April 1998, the governor of the Nenets Autonomous District administration, Vladimir Butov, announced that a new oil terminal under construction at Varandei would be used to ship oil along the northern route to Russian and other European markets. Expected to ease the economic crisis of the region and solve the transport problem, the local administration committed to move forward with the 163 million US dollar project. According to press reports in February 1998, the Nenets Okrug government planned to create a Nenets Oil Company that would consider the interests of the local population and distribute 25% of its share of revenues to the local inhabitants (Interfax 1998; Tiurin & Vynder 1998). But inability to reach agreements with western partners (including Norway's Norsk Hydro, France's Total and US companies such as Texaco, Exxon and Conoco) has delayed investment in the harbour and exploitation of the reserves. Anthropologist Andrei Golovnev visited Varandei in the fall of 1998 in connection with a research project under the International Northern Sea Route Programme (INSROP). His report provides a close-up of Varandei through which we might better understand the conditions that characterize many small communities in the Russian North today (see also Ludviksen 1995). – Gail Osherenko¹.

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I chose Varandei among possible sites to visit in the Nenets Autonomous Okrug mainly because that name has long been fixed in my memory. The 17th century French explorer Pier De La Martinier (1912) described the inhabitants of a mysterious island, Varandei (Borandai) on the coast of the

Barents Sea, as living in pit houses, sewing clothes from polar bear skins and using knives made of stone and bone. In recent decades the name Varandei has become a symbol of the Pechora area's oil and gas future. On 7 October 1985 an excerpt from the local newspaper, *Pravda Severa* (Truth of the North), proclaimed, "The oil-carrier 'Imant Sudmalis' took aboard the first tons of commercial oil on Varandei roadstead and is heading for Arkhangelsk. This is the beginning of a new history of the Nenets Okrug."

Local coastal people believe the name "Var-

¹ Gail Osherenko (Institute of Arctic Studies, Dartmouth College, New Hampshire) commissioned and edited this article for the International Northern Sea Route Programme (INSROP), headquartered at the Fridtjof Nansen Institute in Lysaker, Norway.

andeï” derives either from the name of the Russian merchant-sailor Berendeev or from the Nenets words *var* (“black goose” or “end of the land”) and *varanda* (“reindeer which stands apart”). Whatever the word meant in the past, the current crisis has led to an altogether different meaning, free of etymological origins. Today Varandeï stands for “Coast of Death”.

Two Varandeis

In the 1930s Varandeï was known as a place suitable for sea mammal hunting and fishing and protected from storms by the gulf (Fig. 1). Varandeï was one of a number of small settlements dotting the coastline – Chernaia, Medynskii Zavorot, Krestovka, Peschanka, Alekseevka and so on. The Nenets had also settled on the nearby islands of Dolgii, Bolshoi and Mali Zelenets. Nenets families with a few or perhaps no reindeer lived in two huts at the site of Varandeï. Year-round they harvested sea mammals (ringed seal, bearded seal, walrus), fish (saffron cod, plaice, herring) and Arctic fox. The oldest resident of Varandeï, Yevdokiia Pyrerko (Fig. 2), then 70, told me that her father, Maksim I. Vylka, together with a few other families, used to hunt Arctic fox on Dolgii Island and then would go to the mainland, by boats in summer or by reindeer sledges in winter, to trade fur.

In the mid-1930s after Soviet authorities expropriated reindeer belonging to nomadic and



Fig. 1. Map of a northern section of the Nenets Autonomous Okrug, showing the location of Varandeï.



Fig. 2. The oldest resident of Varandeï, Yevdokiia Pyrerko, with relatives. Photo: A. Golovnev.

semi-nomadic natives, only a few reindeer owners remained in the area, and several impoverished Nenets families were forced by circumstance to settle. Their tents (Russian plural: *chumy*) stood next to the Varandeï huts. With the loss of reindeer at that time, Anna S. Valeiskaia (a Varandeï resident) explained that local Nenets began to use dogs to pull their sledges. At the same time exiled Russians, Ukrainians, Belorussians, Mordva and Komi arrived, transforming the fishing settlement into a village. Later, Soviet authorities established one *kolkhoz* (collective enterprise) named after Lenin there, and another, named after Stalin, in Chernaia to the west along the coast.

As Ivan (Mesanko) F. Taibarei describes, in the fall (usually in October) the Nenets set out to the sea by boat to hunt bearded seal. In February and March they fixed a wide, meshed net (in Nenets: *yunda*) along the ice edge to catch seals. Sometimes a hunter could catch as many as seven or eight seals by *yunda* at once, and usually this amounted to a catch of up to 100 seals over the whole winter season. The Nenets delivered sea mammal skins and fat to the *kolkhoz* and used the meat to feed their dogs. The saffron cod (*Eleginus navaga*) and plaice fished with a net tackle (*riuza*) under ice were shipped to the Naryan-Mar fish factory. During the winter season Varandeï commercial fishermen occupied the vast coastal zone stretching as far as Kharataika on the Yugorskii Peninsula. A hunter could trap 200–300 Arctic fox in a winter season.

In 1951–52 the Lenin collective enterprise merged into the Stalin *kolkhoz*, which was administered from Chernaia village. The building materials for houses, bakeries, shops and schools

in Varandei were transported from the south by the Pechora River and along the coast. (A two-storied school was shipped in the early 1950s from the abandoned village of Pustozersk to Varandei.) In the late 1950s the Stalin kolkhoz was merged into the Kharp kolkhoz, with its administrative centre in Krasnoe village, near Naryan-Mar.

The area incorporated into the Kharp kolkhoz stretched from the Pechora River to the Yugorskii Peninsula; the fishermen occupied the coast, and the reindeer herders migrated in the adjacent tundra. These two groups retained close ties through trade, kinship and rituals: herders visited Varandei and Chernaia on the Day of Fisherman, in July, and fishermen went to the mound Yanci (highland), 60 km from the coast, to be guests of herders on Reindeer Day, in August. Fishermen and herders, side by side, conducted their rituals and sacrifices on the old sacred places – Siungevaseda, Khurtovei, Niutnei. Inland herders bartered with coastal Nenets, trading reindeer meat and pelts for fish and for bearded seal skin needed to make reindeer harness.

In August of 1974 an inauspicious event changed the course of Varandei's future. Six geological surveyors, headed by Roman I. Trebs (later chief of the Varandei oil and gas survey expedition), landed five km east of the village. The Nenets whom Trebs first met cautioned him, "This is a hard place to live; the tundra is bad over here." Nevertheless, the geologists' camp soon grew into a real settlement. Two Varandeis have existed ever since: Old Varandei (the Nenets') and the New Varandei (the geologists'). In 1976 a whole street of stone houses was built along the coastline in the new settlement. In 1980 the Varandei airport, at that time merely a base for eight helicopters, was improved to provide a landing strip for the heavy aircraft, "Antonov-26". Overall 2000 workers, organized into eight brigades, participated in the geological survey expeditions. In 1985, the first oil was shipped from Varandei to Arkhangelsk in an experimental voyage. In the process of transferring oil to the tanker, some oil spilled directly on the coast in an area that had been a seal rookery.

The year 1992 marked the beginning of the end for Varandei. In the fall a strong storm struck the shore of the village (Fig. 3), damaging a section known as the Seventh Expedition. Today the head of the Varandei administration, Viktor A. Mezhenin, believes that builders using coastal boulders for construction did more than the sea to destroy the bank. In any case, removal of the boulders



Fig. 3. Crumbling coast of New Varandei. Photo: A. Golovnev.

would have weakened the barrier protecting the village. In 1993 authorities officially declared Varandei a disaster area. A resolution concerning abolition of the village and removal of its inhabitants from the peninsula to "the big land" (i.e. the more central, developed areas of Russia; generally the larger towns further south) followed. At the same time the negotiations between Russian and foreign companies regarding the terms of a development deadlocked. On 19 April 1993 the okrug newspaper *Nariana Vynder* reported that a state expert commission had some time previously rejected the agreement between Texaco and Arkhangelskgeologiiia (initiated in May 1992) regarding the exploitation of a 7310 km² area in which 130 test oil wells had been drilled and 11 oil fields had been discovered.

During its short period of prosperity in the 1980s, the ephemeral settlement of New Varandei had absorbed almost the whole infrastructure of Old Varandei. Retail stores, power supply, transportation, communication, the school, medical



Fig. 4. View of Old Varandei. Photo: A. Golovnev.

services and other vital functions had been gathered in the geologists' village. The inhabitants of Old Varandei (Fig. 4) found themselves victims of social deadlock: their former relations with the Kharp kolkhoz had been severed, and new ones convulsed by an "act of God". Ironically, in 1992 Kharp was formally converted into a joint-stock company (though it remains a kolkhoz in essence and official title), but the transformation brought no comfort to the stranded coastal Nenets. (For an analysis of the difficulties of departure from the Soviet collective on the neighboring Kola Peninsula, see Konstantinov in press.)

"Red" and "black"

Attempting to keep Kharp functioning in the crisis period, beginning with the perestroika period of the 1980s and continuing into the 1990s, kolkhoz director Petr A. Khabarov proposed shutting down unprofitable activities, such as cattle breeding, and reducing the excessive pool of vehicles (cars, trucks and all-terrain vehicles that were costly to maintain). He recommended concentrating on the collective's profitable spheres reindeer breeding, fur animal hunting and fishing. Although his recommendations were decisively rejected by his superiors in Naryan-Mar and Krasnoe, Khabarov received the support of Alexandr I. Vyucheiskii.

Born in Chernaia village, Vyucheiskii was a deputy of the last Supreme Council of the USSR (Gorbachev); later, he became an ally of Boris Yeltsin. Vyucheiskii was elected twice to the Assembly (*Sobraniie*) of the Nenets Okrug, and in 1995 he was elected president of the okrug's Nenets association "Yasavei". As a representative of an influential Nenets clan, professional geologist and politician, Vyucheiskii embarked on solving hard economic and administrative problems, including Kharp's reformation. In 1998, Vyucheiskii detailed for me the evolution of a new form of herders' union, independent of Kharp:

We started out in 1991 after reindeer herders from Chernaia and Varandei tundra visited me asking for help. I had spent two summers in the tundra and came back from there as an adherent of self-support of reindeer herding. That was the first experience in developing a so-called *fermerskoie khoziaistvo* [farmer holding] in the okrug, and the heads of soviets [local authorities] bucked against it. Nevertheless, Georgii

Yastrebov [the chair of the okrug committee on land resources and land utilization] and I managed to get the resolution passed, and on February 5, 1992, the first "farmer holding" was registered. At the beginning, brigades were leaving the kolkhoz one by one, and each of them had its own name and land. In this way five northern brigades abandoned Kharp. Later, they organized a union of reindeer herders – "Yerv" [Nenets, "master"], headed by Petr Khabarov. Today Yerv unites 36 households that include 143 individuals.

Vyucheiskii, Khabarov, and Yastrebov were not the only ones who had to convert an array of apostles of the kolkhoz tradition. "In the first years they damned us, there was no chance to pass Krasnoe Street and not receive a curse," Mikhail F. Taibarei, a herder and a member of Yerv, recollected. The village Chernaia ("Black") became the base of the new union, though the official headquarters of Yerv as well as some of the rooms of Yerv herders still remained in Krasnoe ("Red") village, which led to continued debates about their right to use "the kolkhoz facilities."

The north-eastern pastures of the Kharp enterprise, and the migration routes formerly used by five brigades, were turned over to Yerv. Although land use experts from Murmansk land use enterprise (contracted in 1995 by the okrug committee on land resources and land use) estimated the carrying capacity of Yerv's pastures at 14 000 reindeer, Yerv had to start from a herd of only 1500 reindeer. Each household member was allowed to keep 50 reindeer as his or her share of the kolkhoz's property. In part due to purchases of reindeer, Yerv's stock grew to 10 000 reindeer within six years. Yerv bought 1000 head in Nel'min Nos (from Vyucheiskii kolkhoz) using funds appropriated by a special order of Yeltsin through subventions of Goskomsever (the State Committee of the North). Yerv was able to buy several reindeer teams from Komi herders. Surprised with the success of the new union, ill-wishers suggested translating "Yerv" as "chief", rather than "master" (referring to Aleksandr Vyucheiskii's role).

Vyucheiskii does not mask his pride in the herders who succeeded in making a fast transition from the apathy of the kolkhoz worker to the responsible attitude of a "tundra keeper." Respected herders were elected elders in all of the nomad camps. Women in Yerv (who own equal

shares with men) helped to build up the reindeer stock by saving on food and clothing, thereby reducing the number of reindeer that would have to be killed to feed and clothe their families. To avoid conflicts within the union, the herders distribute newly purchased reindeer evenly among households; every adult, man or woman possesses about 120 reindeer and 12 000 ha of land. Yerv herders are not tied one to another for eternity: every year, on the eve of Reindeer Day every householder chooses whether to sign a new agreement with the Yerv director, Khabarov. At a ritual feast celebrated beside the Nibte-Yakha River not far from Varandei, herders discuss plans for the forthcoming six month fall–winter period. In April all the camps gather by the Chernaia River to conduct seasonal rituals and discuss actions for the coming spring and summer period.

The five kolkhoz brigades have reorganized into five camps: Vylka, Taleev, Vyucheiskii, Ledkov and Vylka-Ledkov. Each camp controls a herd of about 2000 to 2500 reindeer and migrates along one of the routes of the former brigades. The restructuring has not had a significant effect on the traditional order of migration. Nevertheless, some problems have appeared. For example, one camp must now migrate along a route with which none of its members are familiar.

Ethnic differences in part motivated the partition of Yerv from Kharp: Yerv has drawn Nenets households, and Komi herders have remained a part of Kharp. Nenets are represented only in two of the remaining Kharp brigades. Despite being long-term neighbours, Nenets and Komi each adhere to their own ethnic group: in hybrid kolkhozes (where both groups are represented) they usually form separate brigade-camps. For example, on the Kanin Peninsula during common feasts, the tents of Nenets and Komi stand in separate groups, and youths do not lose a chance to test their strength against the other side. The Komi of Kharp relate more to their southern neighbours (the Komi herders of Naryan-Mar experimental production farm) than to the Nenets of Yerv living to the north-east of them. Several farms of the Komi Republic (Bolshaia Inta, Olenevod, Phion, Severnyi, Ust-Usinskii, Izhemskii Olenevod and Intinskii) pasture their herds in the tundra within the Nenets Okrug. In summer, their migration routes are in close proximity to the Nenets camps. Yerv herders say they often have to visit Komi camps to search for their own stray reindeer. Nevertheless, alertness or even conflicts do not

hinder Nenets from treating Komi as neighbours and even partners. Through the Komi camps to Inta lies “the road of life” which Nenets have to use to exchange sea mammal leather, fur and reindeer for wood and other “southern” commodities.

The appearance of Yerv could be seen as a revival of traditions rather than a modern invention. Likewise (allowing for some diversity) this tendency could be traced in other tundra areas. On the Kanin Peninsula, all of the eleven herding brigades exited the kolkhoz and formed the community “Kanin” in which redistribution of the herds and pastures was in progress in 1998, and the herders were drifting toward polarization as wealthy “thousanders” (those owning herds numbering in the thousands) on the one hand, and workers on the other. On Kolguev Island, the sovkhaz Kolguevskii still retains its power. In the early 1990s when the demand for fresh early summer antler (Russian: *panty*) created a flurry of new business activity among reindeer herders, sovkhaz authorities attempted to commercialize reindeer herding by developing a “panty herd.” The proportion of doe dropped to 40%, but after the failure of this market experiment, Kolguevskii returned to the old herd structure with 65% female reindeer.

From the 1940s, a group of around 20 reindeer herding Nenets households have operated independently of the soviet system. These are the private owners who escaped collectivization by migrating to the Yugorskii Peninsula, the juncture of the Komi Republic, the Nenets Autonomous Okrug and Yamal-Nenets Autonomous Okrug. Among their neighbours these Nenets were known for using parachute cords to harness their reindeer (there was a paratrooper regiment in their area) and for their skill in fashioning decorated bone (or wood) and brass checkerboard pattern sheaths for knives. The village of Khal’mer-Yu served for some of this group as a place of official registration; however, after the village was liquidated, the “owners” found themselves virtually without citizenship because many of them had no internal passports. Sometimes they were accused of intrusion on kolkhoz lands, but okrug authorities in the 1980s (in particular, the secretary of the okrug communist party committee, Yurii S. Romanov) preferred “to leave the matter as it is.” In the mid-1980s a flu-epidemic broke out among these remote “owners” near the river Ust-Kara; in the early 1990s their former trade links (primarily,

those with the city of Vorkuta) were undermined by the system of coupon distribution. The saga of their citizenship quest, however, did not end. Local administrators have been in no hurry to grant them residence permits because "there are many problems with new citizens." In 1995, land use experts visited the camps of these independent herders. Being afraid of the new expropriations, the Nenets declared that they had only 5000 reindeer. That low number became an additional obstacle to their being allocated adequate pastureland. Moreover, the adjacent farms (joined to the city) absolutely refused to give up any part of their land. Officially, the "owners" are organized in the community "Yamb-To", but neither the community as a whole nor any individual household has any formal right to land tenure. As in previous years, "owners" have solved territorial conflicts and found the best way to pasture their large herds "under the table." They might, for example, talk to the necessary people and give a deer or two in exchange for pasture use.

As estimated by Yekaterina V. Nitkina (head of the department on questions of socio-economic development of the Nenets Okrug in 1998), today those Nenets communities that have preserved their nomadic lifestyle in spite of the many years of pressure from Soviet power are more sustainable. Nenets involved in herding but who have settled in villages exhibit a lower socioeconomic survivability. For example, in Khangurei village on the Timan tundra (kolkhoz Naryana-Ty), herders were transported to and from the tundra by helicopters, a practice they can no longer afford. Much less enviable circumstances fell upon villages that became hostages of the recent industrial boom. According to common opinion, the Nenets village Varandei demonstrates the nadir of this predicament.

Oil Sea and Tea Lake

It's hard to determine which decision regarding New Varandei was made with less thought – its construction or its liquidation. The head of the Varandei administration, Viktor A. Mezhenin (formerly a drilling technician), together with the vice-director of the still functioning expedition of "Eastern headquarters on development of oil and gas fields," Valentin A. Kovalenia, both claim that Varandei could completely supply the coastal areas from Pechora to Yamal with fuel if minimal

investment were directed to construct the simplest reprocessor and repair the bank. Similar projects are tossed about in the corridors of okrug power, but while Arkhangelskgeoldobycha, Rosneft, Lukoil, Gazprom, Texaco, Conoco, Norsk Hydro and other players are negotiating preconditions for exploiting Varandei and other fields, the village is turning into ruins.

According to 1998 official statistics, there were about 180 residents in New Varandei; by unofficial count, only 60. Other sources claim there are none at all. Even those who obtained rooms on the "big land" do not rush to leave because, as they say, "it is a sure thing that we'll come back anyway." Those professionals who know each local oil rig "to the last bolt", including one of the legendary six founders of New Varandei, Vladimir Gapotchenko, rest assured that Varandei's suddenly interrupted development will restart in a short time. Varandei has too much allure for developers: large oil reserves lie in the vicinity, the production is expected to be extremely efficient, and the quality of local oil appears to be high. (An extremely low water content and a low freezing point enable the oil to flow freely, even in the strongest frosts, from a drill-hole straight to the village's boilers.) Thus it seems unlikely that developers would abandon this place.

Nevertheless, the state of expectancy regarding exploration has lasted for five years. During this whole period, vehicles, equipment, fuel and building materials have been scattered in different directions; not long before my visit, even the surfacing of the famous airfield for heavy planes had been halted. A spirit of looting reigns now in once wealthy Varandei (Fig. 5). Regular supply of goods has stopped – Varandei shops have no bread, flour, cigarettes or candy. There is vodka,



Fig. 5. New Varandei today. Photo: A. Golovnev.

but it can afford consolation only to a rare keeper of “alive” cash (*zhivyye den’gi*: new Russian slang meaning cash; in contrast to various accounts that are often “dead”, i.e. locked). Residents are in a permanent state of flux relocating from one house that has been cut off from the heat pipe to another one, from Old Varandei to New Varandei or from villages altogether away from the area. Here, questions about the “preservation of culture” sound at least irrelevant, at most, offensive.

I happened to be the lone inhabitant of the local hotel; its door is still adorned with a Texaco emblem. According to one forecast, in the near future only a temporary expedition of Arkhangel’skgeoldobycha (Arkhangel’sk Geological Survey and Exploration Company) will stay in Varandei. All village communication services (already discontinued) as well as retail facilities, the school and the hospital are doomed for destruction. Apparently, their maintenance is unnecessary for oil companies that are “near” resuming the exploitation of Varandei fields and construction of an oil terminal here. It is more convenient for them to wait safely for the end of the Varandei drama and then begin from a clean slate than to fumble with the agonized village. Only one obstacle frustrates the pure experiment: Old Varandei with its “odd people” who wish never to move anywhere.

The Nenets of Old Varandei have no promises of housing on the “big land” to the south; officially, the Nenets settlement is not a part of the “special area” from which relocation will be provided to residents. A few Nenets who worked for the expedition have already obtained or perhaps will soon obtain rooms in Cheboksary or Kovrov and then will exchange these for a flat in Naryan-Mar. But the great majority of Nenets (ca. 160 people according to official statistics) have neither a reason nor any intention to be resettled. When New Varandei is liquidated, these people will be without school, hospital, post, transport or retail stores – all the things that over time became concentrated in the geological village.

Old-Varandei were by no means shocked by the Russian financial crisis; they have no money anyway. Almost no one is employed, and some of them occasionally receive a welfare payment (126 rubles per month, equivalent to four bottles of vodka). Breakfast, lunch and dinner in Old Varandei consist of one and the same thing: fish. I witnessed departing New-Varandei sharing shabby clothes and bits of soap with Nenets.

Presumably, Old Varandei (like the village of Chernaia, with a population of 22) is still related to the Kharp kolkhoz. But this connection seems disembodied. I was informed by the okrug agricultural committee: “all infrastructure in Varandei and Chernaia will be annihilated.” In the words of the Varandei administrator Mezhechin, the Varandei division of the Kharp kolkhoz had been liquidated in 1995; at the same time, the adjacent tundra belongs to “Yerv”. The patron of Yerv Vyucheiskii explained:

At the time when the transport network was intact [i.e. helicopters made flights and the winter road existed], we proposed to pass Chernaia and Varandei to Yerv. We intended to contract people at the fishery [only saffron cod fishing could be profitable for households]. Today we are planning to build a trading post with cold storage on the Chernaia River, not at its mouth, but 40–50 km up the river; there, reindeer herders’ routes cross. It’s possible to raise the coast [improve the coastal area situation], but it’s necessary for kolkhoz Kharp to formally abdicate Chernaia and Varandei.

In the sea, in front of the village, I could see two ships conducting a seismic survey of the shelf where, in experts’ words, “the sea of oil” lies. From there one would have a clear view of two Varandei. Likewise, the two Varandei can be clearly seen from the tundra mounds where Yerv herders migrate. A neutral zone – a narrow coastal strip recently designated the “special area” – separates the surveyors and the nomads.

From New Varandei to the old village lies a road that is used by heavy container trucks. The road transects a permanent stream or channel that connects a lake to the sea. Nenets call this *Chainoie Ozero* (Tea Lake) – they take fresh water from there. The channel, having been crossed and cut by trucks, is now more vulnerable to flooding. Should a sea storm damage the channel and reach the lake, the village’s water source would become salty. Then the “Varandei problem” would finally be solved.

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NORSK POLARINSTITUTT · NORWEGIAN POLAR INSTITUTE
Polar Environmental Centre, N-9296 Tromsø, Norway

Symposium Announcement

H.U. SVERDRUP SYMPOSIUM

The role of ocean/sea ice/atmosphere interaction in polar and sub-polar climate

Tromsø, Norway, 21-23 September 2000

HOSTS

The Norwegian Polar Institute and the Fram Committee will host an international symposium commemorating the Maud Expedition to the Arctic, which was concluded 75 years ago. Professor H.U. Sverdrup, who later became director of Scripps Institution of Oceanography and thereafter of the Norwegian Polar Institute, was responsible for the scientific aspects of the expedition. His name is internationally associated with scientific excellence. The American Meteorological Society, for example, awards the Harald U. Sverdrup Medal for outstanding scientific contributions.

TOPICS

The intent of the symposium is to provide a current assessment of the role of ocean/sea ice/atmosphere interaction in polar and sub-polar climate. The topics will include mixing and exchange processes, fluxes, deep water formation and shelf processes. There will be invited papers, as well as other papers. There will be a limited poster display and brief oral poster presentations. Posters will have the same status as the oral papers in the published proceedings.

TENTATIVE PROGRAMME

Thursday, 21 Sept. The symposium will start with a reception at the Fram Museum in Oslo in the afternoon/evening of 21 Sept. After the reception, it will be possible to go to Gardermoen airport in time to catch flights to Tromsø around 2000h.

Friday, 22 Sept. Registration/official opening, introductions/keynote addresses and workshops.

Saturday, 23 Sept. Oral and poster presentations. Summary of workshop highlights and priorities.

Confirmed invited speakers: Leif Anderson, Sweden; Eddy Carmack, Canada; Bob Dickson, UK; Alexander Makshtas, USA; Cecilie Mauritzen, USA; Jens Meincke, Germany; Walter Munk, USA.

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